

COURSES OF STUDY 2024-25





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VISION

To contribute to India and the World through excellence in scientific and technical education and research; to serve as a valuable resource for industry and society; and remain a source of pride for all Indians.

MISSION

To generate new knowledge by engaging in cutting-edge research and to promote academic growth by offering state-of-the-art undergraduate, postgraduate and doctoral programmes.

To identify, based on an informed perception of Indian, regional and global needs, areas of specialization upon which the Institute can concentrate.

IIT DELHI

To undertake collaborative projects which offer opportunities for long-term interaction with academia and industry.

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Respect and tolerance for the views of every individual.
Attention to issues of national relevance as well as of global concern.
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Appreciation of intellectual excellence and creativity.
An unfettered spirit of exploration, rationality and

enterprise.

COURSES OF STUDY 2024-2025

Undergraduate Programme Rules



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1. UNDERGRADUATE DEGREE REQUIREMENTS, REGULATIONS AND PROCEDURES

1.1 Overall Requirements

1.1.1 B.Tech.

The total credit requirement for the B.Tech. (4-year programme) is 148-158 credits (exact requirement is discipline specific). The minimum and maximum number of registered semesters for graduation requirements are listed in Table 4. For B.Tech. programmes, the total credits are distributed over following categories:

- (a) Institute Core (IC):
 - Basic Sciences (BS): Mathematics, Physics, Chemistry and Biology courses
 - Engineering Arts and Science (EAS): Fundamental engineering courses
 - Humanities and Social Sciences (HUSS): At least two courses to be taken in the 200 level and at least one course to be taken in the 300 level. Management Courses (MSL 3XX) are not counted under this category.
- (b) Departmental Core (DC): courses of relevant discipline.
- (c) Departmental Electives (DE): electives related to the parent discipline.
- (d) Programme linked basic sciences/EAS (PL): additional BS/EAS courses that are specified by the department.
- (e) Open Category (OC): electives can be taken outside or within the discipline; these credits can be used towards departmental specialization or minor area also (see Sec 1.6).
- (f) Non-graded Core (NG) units: These are core requirements and can be earned through formal academic activity and informal co-curricular or extra-curricular activities.

1.1.2 B.Des.

The total credit requirement for the B.Des. (4-year programme) is 149 credits. The minimum and maximum number of registered semesters for graduation requirements are listed in Table 4. For B.Des. programmes, the total credits are distributed over following categories:

- (a) Institute Core (IC)
- (b) Departmental Core (DC): courses of relevant discipline.
- (c) Departmental Electives (DE): electives related to the parent discipline.
- (d) Open Category (OC): electives can be taken outside or within the discipline.
- (e) Non-graded Core (NG) units: These are core requirements and can be earned through formal academic activity and informal co-curricular or extra-curricular activities.

1.1.3 Dual degree programmes

The total credit requirements for a dual degree programme would depend upon the credit requirements of the B.Tech. and M.Tech. programmes that constitute the Dual Degree. The minimum credit requirement for the award of Dual Degree would typically be 10 less than the total credits of the constituent B.Tech. and M.Tech. programmes. The B.Tech. requirements for a dual degree are same as that given in Section 1.1.1. The M.Tech. part is divided into two categories – Programme Core (PC) and Programme Elective (PE). The minimum and maximum number of registered semesters for graduation requirements are listed in Table 4.

1.2 Breakup of Degree Requirements

1.2.1 Earned Credit Requirements for B.Tech.

The minimum earned credit/unit requirements for B.Tech. degree are given in Table 1.

Table 1: Degree Requirements of B.Tech. Programmes

	Category	Symbol	B.Tech. Requirements	Remarks				
1	Institute Core	IC	58 Credits	Common to all disciplines				
2	Programme Linked EAS/BS	PL	0-15 Credits	Discipline specific as decided by the Department				
3	Departmental core	DC	65 90 with min 10 as DE	Discipline specific				
4	Departmental Elective	DE	05-00 WILLI IIIIII. TO AS DE					
5	Open Category	ос	10 Credits	Open to student's choice				
6	Non-graded Core	NG	11 units	See Sec. 1.3				
	Total		148-158 Credits +11 Non-graded units					

1.2.2 Earned Credit Requirements for B.Des.

The minimum earned credit/unit requirements for B.Des. degree are given in Table 2.

Table 2 : Degree Requirements of B.Des. Programmes

	Category	Symbol	B.Des. Requirements	Remarks			
1	Institute Core	IC	02 Credits				
3	Departmental core	DC	123 Credits				
4	Departmental Elective	DE	15 Credits				
5	Open Category	ОС	09 Credits	Open to student's choice			
6	Non-graded Core	NG	09 Units	See Sec. 1.3			
	Total	Total 149 Credits + 09 Non-graded units					

1.2.3 Degree Grade Point Average (DGPA) Requirement

A student must obtain a minimum DGPA of 5.0 to be eligible for award of the B.Tech. degree. The minimum DGPA requirement for M.Tech. part of Dual Degree programme is 6.0. All exceptions to the above conditions will be dealt with as per following regulations:

- (a) If a student completes required credits for B.Tech. with DGPA less than 5.0, then the student will be permitted to do additional elective courses under appropriate category to improve the DGPA within the maximum time limit for completion of B.Tech. degree. In case a DGPA of 5.0 or more is achieved within the stipulated period, a B.Tech. degree will be awarded and in case the same is not achieved no degree will be awarded and the student may apply for a diploma.
- (b) If a student completes requisite credits for Dual Degree Programme:
 - (i) with B.Tech. DGPA less than 5.0 but M.Tech. DGPA more than 6.0
 - The student will be permitted to do additional elective courses (under appropriate category) to improve the DGPA for completion of B.Tech. part within the maximum time limit. In case a DGPA of 5.0 or more is achieved for B.Tech., the student will become eligible for award of the Dual Degree (B.Tech. & M. Tech.) and in case the same is not achieved no degree will be awarded and the student may apply for a diploma.
 - (ii) with B.Tech. DGPA more than 5.0 but M.Tech. DGPA less than 6.0
 - The student may opt to do additional elective courses (PE category only) to improve the DGPA within the maximum time limit. If no programme elective (PE) courses are available, other relevant 700 and 800 level courses as approved by the department can be done for the purpose of improving the DGPA. In case DGPA of 6.0 or more is achieved for the M.Tech. part, the student will be eligible for award of the Dual Degree (B.Tech. & M.Tech.). However, in case the same is not achieved at the end of the stipulated period, the student will be eligible for the award of only B.Tech. degree, provided a written request for the same is made to the Dean, Academics.
 - (iii) with B.Tech. DGPA less than 5.0 and M.Tech. DGPA less than 6.0
 - The student will be permitted to do additional elective courses under appropriate categories to improve the DGPA for completion of B.Tech. and courses under PE category for completion of M.Tech. degree within the maximum time limit. If no programme elective courses are available, relevant 700 and 800 level courses as approved by the department can be done for the purpose of improving the DGPA of the M.Tech. part. In case a DGPA of 5.0 or more for B.Tech. and 6.0 or more for M.Tech. are achieved, the student will be eligible for award of the Dual Degree (B.Tech. & M.Tech.). However, in case a DGPA 5.0 or more for B.Tech. is achieved but the DGPA of 6.0 or more for M.Tech. is not achieved at the end of stipulated period, the student will be eligible for award of only B.Tech. degree provided a written request for the same is made to the Dean, Academics.
- (c) A student may be permitted to do additional elective courses under appropriate elective categories for improving DGPA, even if he/she satisfies all graduation requirements. The student may be permitted to register for courses in the additional semesters, up to the maximum limit in terms of registered semesters for improving his/her DGPA provided a request for the same is made to the Dean, Academics within 15 days of the notification of grades in the final semester. During this period when the student is registered for improving DGPA, no hostel facilities or assistantship will be provided to the student.

- A B.Tech. student is eligible to apply for a Diploma provided he/she has earned 100 credits and has exhausted the maximum number of permitted registered semesters for completion of his/her degree. If the student has completed 50 credits (out of 100 credits) from his/her DC+DE+PC+PE categories then the student will be awarded 'Undergraduate Diploma in the respective discipline' on completion. If the student has not completed 50 credits from these categories but has completed 100 credits then he/she will be awarded 'Undergraduate Diploma in Engineering'. The Diploma is not equivalent to an undergraduate degree.
- No self-study course will be permitted for the purpose of improvement of DGPA.

1.2.4 Audit Courses

Audit facility is open to all undergraduate (B.Tech./Dual Degree) students who have 85 Earned Credits. A student will be permitted to do any number of audit courses over and above the graduation requirements. The audit limits for graduation are:

- B.Tech. (4-year) programme: A maximum of 8 credits from the elective courses in any category out of the total credits required for B.Tech. degree may be completed on audit basis.
- Dual-degree programme: A maximum of 8 credits from the elective courses in any category may be completed on audit basis from the UG part of the programme.
- A student earns either an NP (audit pass) or an NF (audit fail) grade for an audit course. The audit pass (NP) (c) grade may be awarded if the student satisfies the attendance criteria specified for the course and he/she has obtained at least a 'D' grade. The course coordinator can specify a higher criterion for audit pass at the beginning of the semester. If either of these requirements is not fulfilled, the audit fail (NF) grade is awarded.
- Grades obtained in an audit course are not considered in the calculation of SGPA or CGPA. (d)

1.3 Non-graded Core Requirement

As part of the curriculum, non-graded units have been prescribed as core requirements for the undergraduate degree. These units can be earned through a combination of formal academic activities and informal co-curricular or extra-curricular activities. The components of non-graded core requirement are listed in Table 3.

Table 3: Components of Non-Graded Core Requirement for B.Tech. and Dual Degree*

	3 Communication Skills/Seminar 4 NCC/NSO/NSS 5 Professional Ethics and Social Responsibility 6 Design and Practical Experience	Minimum NGUs for Graduation	Maximum Countable Towards Total of 11 NGUs
1	Introduction to Engineering and Programme	1	1
2	Language and Writing Skills	2	2
3	Communication Skills/Seminar	1	1
4	NCC/NSO/NSS	1	2
5	Professional Ethics and Social Responsibility	1	2
6	Design and Practical Experience	3	5
	Total		11

^{*}NGU in case of B.Des. programme will be updated later.

The 11 units listed in Table 3 will be core requirement for students of all undergraduate programmes with entry year 2020 or later. A student must earn these 11 units over the complete duration of the programme with special requirements for each component as explained in Section 4. A student must get 'S' grades to earn these units. Incomplete performance in these components will be indicated by a 'Z' grade.

For components 3-6 in the above table, a special portal called the NGU portal is used for necessary approvals and posting of "S" grades. This portal can be accessed at https://ngu.iitd.ac.in/index

A brief description of the six components is given below. For complete details, please refer to Section 4.

Introduction to Engineering and Programme (NIN100) (1 unit)

This course will introduce the students to the vast domain of Engineering in general with a glimpse of the

specifics of various engineering disciplines. All students will be required to register for this course in the first semester for earning 1 unit. These may involve listening to guest lectures, interaction with distinguished alumni, simple product building and product dissection exercises, executing simple design thinking exercises, visit to laboratories (in and outside the Institute) and industry.

(b) Language and Writing Skills (NLN100 and NLN101) (2 units)

All students will be required to participate in Task-Based Language Learning (TBLL) exercises in the first year, through two core courses: NLN100 in first semester and NLN101 in second semester. These language games are designed to enhance their linguistic capabilities in comprehension, both reading and listening, as well as improve their ability to structure and compose ideas in spoken and written communication. Wherever necessary principles of English Grammar will be discussed along with the nuances of technical writing. The Language Needs of a particular class of students will be assessed through an initial language test at the beginning of the first semester. Then, the exercises will be tailored according to the specific language needs of the particular class of students. These exercises could be scheduled during normal academic hours or outside. Based on the performance and regularity, a student may be prescribed additional self-learning exercises and practice sessions during vacations as well, as requirement for securing an 'S' grade.

(c) NCC/NSO/NSS (NCN100/NSN100/NPN100) (Minimum 1 and Maximum 2 units)

NCC/NSO/NSS also form part of the core requirement of the degree. Students will be required to earn at least 1 unit from these activities involving 40 hours of work and a maximum of 2 units for 80 hours of work towards the total NGU requirement.

(d) Professional Ethics and Social Responsibility (PESR) (Minimum 1 and Maximum 2 units)

There is increasing consensus worldwide that professional ethics need to be incorporated into the engineering curriculum to provide students exposure to the kind of professional and ethical dilemmas they might face on an individual basis as well as the larger ethical aspects of technology development. Workshops, discussions/debates will be organized to sensitize students about Professional Ethics and Social Responsibility (PESR). This component has 3 core courses: NEN110 in first semester, NEN111 in 2nd semester and NEN300 after 3rd year corresponding to a total of 1 unit. Students can earn an extra unit through additional activities, such as PESR workshops (NEN212) and PESR projects (NEN213). For more details, please see Section 4.4.

(e) Communication Skills/Seminar (1 unit)

Communication Skills is an essential requirement for a modern engineer. As a part of the degree requirements, undergraduate students will have to earn 1 unit in communication skills by registering for a seminar course or an equivalent activity. Please see Section 4.5 for details.

(f) Design and Practical Experience (Minimum 3 and Maximum 5 units)

The objective of this non-graded core requirement component is to give opportunities to students to acquire substantial design and practical experience both as a part of formal courses as well as in an informal setting. Second and even more important objective of this course is to inculcate design thinking among students and facilitate gaining some design immersion experience. Design and Practical Experience (DPE) component is introduced to promote learning by doing which does two important things: it allows students to immerse themselves in the environment in which work is to be done, so that they can understand the values and expectations of the target beneficiaries. Secondly, it enables a fresh look at problems, not only at the ways of defining them, but also at the ways to solve those including skill-sets that are required to address them. A shift from problem-based learning (acquisition of knowledge) to project-based learning (application of knowledge), where the projects are grounded in problems outside the classrooms and labs in everyday scenarios, will involve students in reality, and reality in education. Design and Practical Experience bridges division between the curricular and the co-curricular and encourages curiosity and involvement that arise out of total absorption in a subject of interest. Non-graded units in Design and Practical Experience can be earned through one or more of the following:

- Specialized Elective Courses related to Design and Practical Experience (Maximum 2 Units)
- Regular Courses with optional Design and Practical Experience Component (Maximum 2 Units)
- Summer/winter/semester/SURA/DISA projects with Institute faculty, not evaluated for earning credits (Maximum 2 units)

- Co-curricular projects such as Robocon, SAE-minibaja, etc. (Maximum 2 Units)
- Summer Internships with Industry (Maximum 2 Units)
- One Semester Internship (Maximum 5 Units)
- Workshop Module on Design and Practical Experience offered by Faculty/Visitors (1 Unit each)
- Section 4.6 gives complete details for this component.

1.4 Minimum and Maximum Durations for Completing Degree Requirements

- (a) The minimum and maximum permitted duration of each academic programme will be determined in terms of number of registered regular semesters, hereinafter called registered semesters. Any semester in which a student has registered for a course will be called a registered semester subject to the following:
 - (i) Only the First and Second semesters of an academic year can be registered semesters. The summer semester will not be counted as a registered semester.
 - (ii) A semester when a student has been granted semester withdrawal or granted semester leave will not be considered as a registered semester.
 - (iii) The semester when a student is suspended from the Institute on disciplinary grounds will not be counted towards the number of registered semesters.
 - (iv) A semester in which a student is allowed by the Institute to undergo semester long internship will be counted as a registered semester.

The summer semesters shall normally be available for earning credits. However, after the student has registered for the maximum permissible number of registered semesters, the subsequent summer semesters will not be available for earning credits.

(b) The minimum and maximum permissible number of registered semesters for completing all degree requirements are defined in Table 4.

Table 4: Minimum and Maximum		

Programme Name	Minimum Number of Registered Semesters	Maximum Number of Registered Semesters Permitted for Completing Degree Requirements				
B.Tech.	8	12*				
B.Des.	8	12*				
Dual Degree	10	14*				

^{*}If a student opts for the slow-paced programme, then the maximum permissible number of registered semesters shall be increased by two semesters.

1.5 Absence During the Semester

- (a) A student must inform the Dean, Academics immediately of any instance of continuous absence from classes.
- (b) A student who is absent due to illness or any other emergency, up to a maximum of two weeks, should approach the course coordinator for make-up quizzes, assignments and laboratory work.
- (c) A student who has been absent from a minor test due to illness should approach the course coordinator for a make-up test immediately on return to class. The request should be supported with a medical certificate from Institute's medical officer. A certificate from a registered medical practitioner will also be acceptable for a student normally residing off-campus provided registration number of the medical practitioner appears explicitly on the certificate.
- (d) In case a student misses a minor test on the same day on which he/she has appeared in another test, a medical certificate from the institute's medical must be submitted.
- (e) In case of absence on medical grounds or other special circumstances, before or during the major examination period, the student can apply for 'l' grade. At least 75% attendance in a course is necessary for being eligible for request of I-grade in that course. An application requesting I-grade should be made at the earliest but not

later than the last day of major tests. An online application should be made by the student. On submission of a medical certificate/Dean's permission, the Academic Section verifies the certificate and forwards the request to the concerned course coordinator. The course coordinator verifies the attendance requirement and forwards the application to the Head of the Department/Centre/School of the student's programme. Head's approval is contingent upon the satisfaction of attendance requirement. On approval, an 'l' grade is awarded to the student. All evaluation requirements for students with 'l' grade should be completed before the end of the first week of the next semester. Upon completion of all course requirements, the 'l' grade is converted to a regular grade (A to F, NP or NF).

- (f) In case the period of absence on medical grounds is more than 20 working days during the semester, a student may apply for withdrawal from the semester, i.e. withdrawal from all courses registered that semester. Such application must be made as early as possible and latest before the start of the major tests. No applications for semester withdrawal will be considered after the major tests have commenced. Dean, Academics, depending on the merit of the case, will approve such applications. Partial withdrawal from courses registered in a semester is not allowed.
- (g) If a student is continuously absent from the institute for more than four weeks without notifying the Dean Academics, his/her name will be removed from institute rolls.

1.6 Conditions for Continuation of Registration, Termination/Re-start, Probation and Warning

During the first two registered semesters of an undergraduate(B.Tech./Dual Degree) programme, a student is registered for a total of 34 credits, besides non-graded units. By the end of the first two registered semesters, not including summer, a student is expected to earn a minimum number of credits (excluding non-graded units) as specified in Table 5, in order to continue registration. If a student does not meet this criterion, his/her performance is classified as "Poor Performance", and he/she may opt to start the programme afresh, or else his/her registration will be terminated. This option to re-start the programme is available to a student only once.

Description		Credits n-graded units)	Decision
·	GE/OBC/EWS	SC/ST/PD/PwD	
Minimum for Continuation	23	19	Continuation of registration
Poor Performance	≤ 22	≤ 18	Restart (Once only)/Termination of registration

Table 5: Criteria for continuation at the end of second registered semester

- (a) If a student chooses to restart after the first two registered semesters, then his/her credits earned and semesters registered will not be carried over. The re-start will be indicated on the transcript. The re-start will be permitted only once. If at the end of two registered semesters after re-start, the earned credits are less than or equal to 22 for GE/OBC or less than or equal to 18 for SC/ST/PD students, then the registration will be terminated.
- (b) Each student is expected to earn at least 12 credits in each registered semester with an SGPA greater than or equal to 5.0. If the performance of a student at the end of any registered semester is below this minimum acceptable level, then he/she will be placed on probation, a warning shall be given to him/her and intimation sent to the parents.
- (c) A student placed on probation shall be monitored, including mandatory attendance in classes, special tutorials and mentoring. Mentoring would comprise structured guidance under a senior/postgraduate student.
- (d) If the performance of a student on probation does not meet the criterion in item (b) in the following registered semester, then the student would face termination, and will be permitted to register by the Dean, Academics only if the department makes a favourable recommendation. The Head of the Department's recommendation shall be prepared after consultation with the student, and should include (i) feasibility of completing the programme requirements, and (ii) identification of remedial measures for the problems leading to poor performance.
- (e) A student on probation can register upto 18 credits in a semester. This can be relaxed in 8th/10th or later registered semester for B.Tech./ Dual Degree students, respectively.

Slow-paced Programme

- (a) If a student has earned the minimum credits specified in Table 5 for continuation but has less than 28 Earned Credits at the end of the first two registered semesters, he/she will be eligible to opt for the slow-paced programme. A student opting for such a programme shall be permitted two additional registered semesters for completing degree requirements as indicated in Table 4.
- (b) In the slow paced programme, the upper limit for credits registered in a semester will be 18. A student in this programme is expected to earn at least 9 credits with minimum SGPA of 5.0 in any semester, falling which he/she will be issued a warning and placed on probation.
 - A student placed on probation would be monitored, including mandatory attendance in special tutorials and mentoring.
 - If the performance of a student on probation does not meet the above criterion in the following registered semester, then the student would face termination and will be permitted to register by the Dean Academics only if the department makes a favourable recommendation. The Head of the Department's recommendation shall be prepared after consultation with the student, and should include (i) feasibility of completing the programme, and (ii) identification of remedial measures for the problems leading to poor performance.
- (c) The semester-wise schedule of the slow-paced programme shall be defined by the respective department for each student.

1.7 Scheme for Academic Advising of Undergraduate Students

Advising Scheme for Regular Students

- (a) There is a class committee for each entry year of all programmes. The class committee is responsible for providing consistent and uniform academic advice to the entire batch of students.
- (b) Class committee shall consist of a Chairperson, at least two faculty members of the department (one of them will function as Convenor of the class committee) and elected student representatives (as per CAIC constitution) including a student coordinator. All student coordinators of courses intended for the batch in a given semester and special advisors of academically weak students will be permanent invitees to the class committee. The faculty members in the class committee would be referred to as Faculty Mentors for the batch.
- (c) A Chairperson appointed for each entry year of students by the Head of the Department shall be associated with the batch till it graduates and will provide basic guidance for formulating course plan and electives for the students of the batch.
- (d) The Convenor of a class committee will be appointed in a year-specific fashion: for example, the Convenor of the second year class committee would continue in the same position for 3 years, serving consecutive batches.
- (e) Students can approach any class committee member for academic advice before registration. In other words, all the three members of the class committee will have the functional role of mentor and local guardian for all the students. In case of need for any exception and relaxation in rules or regulations pertaining to registration of courses, the class committee Convenor will recommend and forward the request.
- (f) The faculty members of the committee in consultation with the elected representatives of the students will provide academic advice applicable to all the students in general. The class committee is also expected to discharge following responsibilities:
 - (i) Considering mid-semester feed-back about courses running in the current semester.
 - (ii) Identifying electives for the subsequent semester.
 - (iii) Addressing issues related to scheduling and categorization of courses.
 - (iv) Organizing STIC events for the batch.
- (g) The Class Committee Convenor with the support of student coordinator will organize at least one Student-Teacher Interaction Committee (STIC) event in each semester for interaction between class committee members and all the students of the batch.
- (h) The Chairman, Convenor and the other faculty members of first year class committee would be identified by the department prior to the orientation of new students. During orientation, students and their parents will be introduced to these class committee members.

Advising Scheme for Academically Weak Students

- (a) The students on probation in each batch will be put under a special advisor, identified by the department, who is expected to monitor the students on probation in a personalized manner. Normally, not more than 5-8 students would be assigned to a special advisor. Heads of Departments will appoint special advisors at the beginning of an academic session.
- (b) A meeting of the special advisors with Dean, Academics would be held at the beginning of each semester for coordination of the advising process.
- (c) A student on probation is expected to be in close contact with the advisor by meeting him/her at least once every 3 weeks for the entire period during which the student continues to remain in probation. Special advisors will be invitees to the class committee meetings.
- (d) Special advisor in consultation with the parents and student counsellor, if required, will make a student-specific academic plan. The special advisor is expected to:
 - Closely interact with the weak student and his/her parents
 - Formulate individualized academic plan
 - Manage and track counselling process of the student, if any, in coordination with the Associate Dean, Student Welfare.
 - Approve their registration
 - Manage the recommendation/appeal for termination/continuation process in consultation with Head of the Department and Dean, Academics.
- (e) At the time of registration for a semester, the student meets his/her advisor if possible with parents, to:
 - · Identify specific problems and ways to mitigate the same
 - Formulate academic plan and target(s) for the semester
 - Help Head of the Department in the processing of the student's appeal against termination, if applicable
 - Approve the registration of the student online.
- (f) The student being placed under probation for the first time may also meet the counsellor during this period, if needed. The counsellor can provide professional help in identifying to resolving problems. Counsellors' input will be available to the special advisor. During the add-drop period, the student, preferably along with his/her parents, should come and meet the Counsellor.
- (g) While considering any appeal from an academically weak student for continuation of his registration, the Dean, Academics would consider the following:
 - (i) whether he/she has met his/her Advisor and Counsellor at the scheduled times on a regular basis and
 - (ii) whether he/she is regular in help sessions.
 - Registration of a student under probation will not be approved for the next semester if he/she does not comply with the process of meeting the advisor and counsellor. He/she will then be required to withdraw from the semester.
- (h) A student on probation will not be permitted to contest for any position of responsibility. However, he/she will be permitted to participate in extra-curricular activities in a restricted fashion only on specific recommendation of his/her advisor.

An Institute level committee known as the Welfare Committee would monitor the entire operation of academic advising for weak students. Functions of the Welfare committee include monitoring the performance of weak students and making the final recommendations regarding termination/ continuation, restarting first year and slow-paced programme requests. This committee would also evaluate the weak students based on the feed-back regarding

- (i) regularity in meeting the advisor and/or counsellor
- (ii) student's attendance in help sessions and
- (iii) academic performance.

A summary of the weak student's performance would be made available to the class committee members, Head of the student's Department as well as Course Coordinators of the courses in which the student is currently registered.

Student Mentors

- (a) Each student will be assigned a student mentor from the same hostel and preferably from the same discipline to mentor students on academic and extra-curricular activities and provide feed-back to the advisor and counselor in case of weak students.
- (b) There are individual incentives for good student mentors. Also, hostels performing well on mentoring benefit in terms of points towards BSW trophy.

1.8 Capability Linked Opportunities for Undergraduate (B.Tech./Dual Degree) Students

A student registering for 24 credits in each semester after first year and 26 in two semesters can complete a maximum of 182 credits. Since the graduation requirement for 4-year B. Tech. programmes varies between 148-158 Earned Credits, it will be feasible for capable students to add value to their degrees by registering for additional courses of their choice.

Students can make use of these additional credits in two blocks of 20 credits to opt for:

- (a) Minor/Interdisciplinary Area Specialization
- (b) Departmental Specialization

A student based on his/her performance and interest can choose either one on both. Successful completion of minor area credits and/or departmental Specialization will be indicated on the degree.

When a student opts for a departmental specialization and/or a minor area, he/she can use 10 open category credits (mandatory degree requirement) towards departmental specialization and/or minor area requirements. For example, a student registered for B.Tech. (Chemical Engineering) and opting for minor area in Computer Science and Engineering, can opt for courses prescribed for minor area in Computer Science and Engineering, as part of mandatory 10 credits requirements under OC. He/she will need to do additional 10 credits in the minor area to be eligible for Minor area specialization in the degree.

A student may not opt for either of the two but can do additional credits through open choice of courses. In case a student cannot meet requirements of a minor area or departmental Specialization, additional credits earned by the student over and above his/her degree requirement will be used for DGPA calculation and will be indicated on his/her transcript.

A set of pre-defined courses of total 20 credits in a focus area comprises a Departmental Specialization if the courses belong to the parent Department of an undergraduate programme, or a Minor/Interdisciplinary Area Specialization if the courses belong to a different Department/Centre/School. Additional conditions and details of individual specializations are given in UG Rules, Section 3.

If any course of a Minor/Interdisciplinary area overlaps with any core course (DC or PC category courses) or elective course (DE or PE category courses) of the student's programme, then credits from this course will not count towards the minor area credit requirements, though this course may contribute towards satisfying the requirement of the Minor/Interdisciplinary area. In such a case, the requirement of 20 credits must be completed by taking other courses of the specialization.

The maximum number of credits per semester may be relaxed upto 28 by Dean, Acaemics for those students who apply for capability-linked option through proper channel.

1.9 Change of Programme at the End of the First Year

- (a) An undergraduate (B.Tech./Dual Degree) student is eligible to apply for change of branch at the end of the first year only, provided he/she satisfies the following criteria:
 - (i) CGPA for General and OBC category students : >8.00
 - (ii) CGPA for SC/ST and Person with Disability category students: >7.00
 - (iii) Earned credits/non-graded units at the end control of the second semester of the first year and credits of core and non-graded units of the first year.
 - (iv) Optionally, one first year course would be identified by each programme, in which the grade of the applicant is equal to or above B. Alist of such courses identified for various programmes is given in Table 6.
- (b) The student should have no disciplinary action against him/her.
- (c) Change of the branch will be permitted strictly in the order of merit, in each category, as determined by CGPA

- at the end of first year, subject to the limitation that the actual number of students in the third semester in the branch to which transfer is to be made should not exceed its sanctioned strength by more than 15% and the strength of the branch from which transfer is being sought does not fall below 85% of its sanctioned strength.
- (d) In case more than one student applying for programme change have the same CGPA, the tie shall be resolved on the basis of JEE ranks of such applicants.
- (e) The conditions mentioned in item (a) above will not be insisted upon for change to a branch in which a vacancy exists with reference to the sanctioned strengths, and the concerned student was eligible as per JEE Rank for admission to that branch at the time of entry to IIT Delhi. However, these conditions will continue to apply in case of students seeking change to a branch to which the concerned student was not eligible for admission at the time of entry to IIT Delhi.

Table 6: Qualifying criterion as per a (iv) for change of branch

S. No.	Pr	rogramme Code and Name of the Programme to which change is sought	Specified Course in which a minimum of B grade is required
1	AM1	B.Tech. in Engg. and Computational Mechanics	APL100: Engineering Mechanics
2	BB1	B.Tech. in Biochemical Engg. and Biotechnology	CML101: Introduction to Chemistry
3	CH1	B.Tech in Chemical Engineering	MTL101: Linear Algebra and Differential Equations
4	CH7	B.Tech. and M.Tech in Chemical Engineering	MTL101: Linear Algebra and Differential Equations
5	CE1	B.Tech in Civil Engineering	APL100: Engineering Mechanics
6	CS1	B.Tech. in Computer Science and Engineering	COL100: Introduction to Computer Science
7	CS5	B.Tech. and M.Tech in Computer Science and Engg.	COL100: Introduction to Computer Science
8	EE1	B.Tech. in Electrical Engineering	None
9	EE3	B.Tech. in Electrical Engg. (Power and Automation)	None
10	ES1	B.Tech. in Energy Science & Engineering	To be decided
11	MS1	Materials Science and Engineering	APL100: Engineering Mechanics
12	MT1	B.Tech. in Mathematics and Computing	MTL100: Calculus
13	MT6	B.Tech. and M.Tech. in Mathematics and Computing	MTL100: Calculus
14	ME1	B.Tech. in Mechanical Engineering	None
15	ME2	B.Tech. in Production and Industrial Engineering	None
16	PH1	B.Tech. in Engineering Physics	PYL101: Electromagnetism & Quantum Mechanics
17	TT1	B.Tech. in Textile Technology	APL100: Engineering Mechanics

1.10 Self-study Course

A self-study course will be from the regular UG (B.Tech./Dual Degree) courses listed in this document (Course description). The main features of a self-study course are as follows:

- (a) A student may be given a self-study course not exceeding 5 credits in the final semester if he/she is short by a maximum of 5 earned credits required for graduation and provided that the course is not running in that semester as a regular course. Students in the Dual-Degree programmes are allowed to avail of this provision during their last semester. However, they would be permitted to take only a UG course as a possible selfstudy course. A student can make use of this provision only once during the programme.
- (b) A student may also be permitted to do a U.G. core course not exceeding 5 credits in self-study mode at most

- once during the program, provided he/she has failed in it earlier and the course is not being offered as a regular course during that semester.
- (c) Students should apply for a self-study course with appropriate recommendation of a Course Coordinator and the Head of the Department of the student's programme. The final sanction of a self-study course to a student is made by the Dean, Academics.
- (d) Normally, no formal lectures will be held for a self-study course but laboratory, design and computation exercises will be conducted if they form an integral part of the course.
- (e) The Course Coordinator will hold minor and major tests besides other tests/quizzes for giving his/her assessment at the end of the semester. In summer semester, there will be at least one mid semester test and a major test.
- (f) The self-study course will run during the total duration of a given semester (Semester I, Semester II, or the summer semester).

1.11 Assistantship for Dual-Degree Programmes

The students of dual-degree programmes will be considered for award of institute research/ teaching assistantship if they have earned 135 credits. Only those students who have either qualified GATE or have a CGPA more than 8.0 will be eligible for this assistantship. The assistantship will be provided for a maximum period of 14 months beginning from the summer semester following eighth semester, provided the student is registered for M.Tech. Major Project in that semester. A student availing assistantship will be required to provide 8 hours of assistance per week besides his/her normal academic work. For continuation of assistantship a student will need to secure SGPA of 7.0 for Ge/OBC and 6.75 for SC/ST. A student will be eligible to receive assistantship from sources other than institute fund or MHRD if he/she has a CGPA of 7.0 and has earned 135 credits.

A student receiving assistantship will be eligible for total of 30 days leave during the 14-month period. He/she will not be entitled to mid-semester breaks, winter and summer vacations.

1.12 Admission of UG Students to PG Programmes

Undergraduate (B.Tech./Dual Degree) students of the Institute are eligible for admission to PG programmes at IIT Delhi. For admission to PG programme the minimum CGPA required at the end of sixth semester shall be 7.5. The student will be awarded both the degrees - B.Tech. and the PG degree on successful completion of the degree requirements of both the programmes with provision for waiver of a maximum of 10 credits.

1.13 Measures for helping SC/ST Students

A number of measures exist for helping students belonging to SC and ST categories. A senior faculty member is appointed as adviser to SC/ST students for advising them on academic and non-academic matters. Financial measures for helping SC/ST students are described in the Prospectus.

1.14 Measures for helping Students with Disabilities

To establish a complete accessible system to help the students with special need, (Office of Accessible Education) has been set-up recently. It is supporting the students with assistive devices and technical training programme. It is also conducting workshops for disability awareness in the campus.

2.	UNDERGR	ADUATE P	ROGRAM	ME STRU	CTURES

Bachelor of Technology in Engineering and Computational Mechanics Department of Applied Mechanics

Course C	all Credit Structure	Cre	edit	s	APL380	Advanced Fluid Dynamics Bio-mechanics			0 3
	Core Courses	2.0			APL390		2	0	3 3
	iences (BS)	2	24		APL405	Machine Learning in Mechanics	2	0	2 3
	ring Arts and Science (EAS)	1	19		APL410	Multi-Scale Modeling and Computation	3	0	0 3
	ies and Social Sciences (HuSS)		15		APD411	B.Tech. Project-I	0	0	8 4
	me-linked Courses	12.				Total Credits			65.
•	ental Courses					Total Credits			03.
•	ental Core	65.	5.5		Donartm	ental Electives			
	ental Electives		12					_	
	tegory Courses		10			Mechanics of Cricket			0 1
	ided Credit requirement	15				Vibration			0 3
	ded Units		11		APL340	Chaos	3	1	0 4
non Orac	dod office	•	••			Fluid Structure Interaction	3	0	0 3
Institute	Core : Basic Sciences				APL411	Application of Finite Element Methods	2	0	2 3
		2 1	^	4	APD412	B.Tech. Project-II	0	0	126
	Introduction to Chemistry	3 1			APL412	Computational Multibody Dynamics	3	0	0 3
	Chemistry Laboratory	0 0				Composite Mechanics and Structures	3	0	0 3
MTL100		3 1				Application of CFD			2 3
	Linear Algebra and Differential Equations	3 1				Advanced Computational Fluid Dynamics			2 3
	Electromagnetism & Quantum Mechanics	3 1				Introduction to Hydrodynamics Stability			0 3
	Physics Laboratory		-	_		Aircraft Structures			0 3
SBL100	Introductory Biology for Engineers	3 0	2			Aero-Elasticity			0 3
	Total Credits			24		,			0 3
					APL433				
Institute	Core: Engineering Arts and Sciences				APL434				0 3
APL100	Engineering Mechanics	3 1	0	4	APL435	•			0 3
COL100	Introduction to Computer Science	3 0	2	4	APL440	Parallel Processing in Computational Mechanics			
CVL100	Environmental Science	2 0	0	2	APL450	Introduction to Soft Robotics			0 3
ELL101	Introduction to Electrical Engineering	3 1	0	4	APL452	Introduction to Digital Twins	2	0	2 3
ELP101	Introduction to Electrical Engineering (Lab)	0 0	2	1	APL491	Reliability Engineering			0 3
MCP100	Introduction to Engineering Visualization	0 0	4	2	APL701	Continuum Mechanics	3	0	0 3
	Product Realization through Manufacturing	0 0	4	2	APL713	Turbulence and its Modeling	3	0	0 3
	Total Credits			19	APL715	Physics of Turbulent Flow	3	0	0 3
	rotar oreans			13	APL736	Multiscale Modeling of Crystalline Materials	3	0	2 4
Programi	me-Linked Basic/Engineering Arts/Scienc	es Co	ore		ALP737				0 3
					APL740	Mechanics of Biological Cells			2 3
	Numerical Methods and Computations	3 0				Advanced Bio-Mechanics			0 3
	Data Structures and Algorithms	3 0				Probabilistic Machine Learning for Mechanics			2 4
ELL201	Digital Electronics	3 0	3	4.5		Deep Learning for Mechanics			2 4
	Total Credits		12	2.5	APL747	Uncertainty Quantification and Propagation			0 3
					APL747 APL764				
Humaniti	ies and Social Sciences					Biomaterials			0 3
Courses f	from Humanities, Social Sciences and Manage	ement	t		APL765	Fracture Mechanics			0 3
	nder this category		1	5	APL771	Design Optimization and Design Theory			0 3
	3 ,				APL787	8			0 3
Departme	ental Core				ELL715	Digital Image Processing			0 3
	Applied Mathematics for Engineers	3 0	0	3	ELL794	Human Computer Interface			0 3
	Introduction to Material Science and Engg.	3 0			APL805	Advanced Finite Element Methods	3	0	0 3
	Experimental Methods	3 0			Cummont	ad Caurage under Onen Floative Caurage			
	Solid Mechanics	3 1				ed Courses under Open Elective Courses			
	Fluid Mechanics	3 1			COL216	Computer Architecture			2 4
	Dynamics of Mechanical Systems	3 1			COL334	Computer Networks	3	0	2 4
APL205 APL205	Basics of Computer Aided Design	2 0			COL341	Fundamentals of Machine Learning	3	0	2 4
	•	2 0				Principles of Artificial Intelligence			2 4
	Engineering Thermodynamics Heat Transfer	2 0				Introduction to Database Mgmt. System			2 4
						Discrete Mathematical Structures			0 4
	Solid & Fluids Lab	0 0				Computing Laboratory			4 :
	Basics of Product Design	3 0				Analysis and Design of Algorithms			0 4
APL311	Introduction to Finite Element Method	3 0				•			
	Introduction to Computational Fluid Dynamics	3 0				Operating Systems			2 4
APL331	Advanced Mechanics of Solids	3 0	0	3	M1L415	Parallel Algorithms	3	O	0 3

Total = 158.0

B.Tech. in Engineering and Computational Mechanics

Contact Hours			31.0			24.0				25.0			25.0			24.0			24.0			28.0		13.0
Non-graded Units			0.25			1.25				0			0			0			0			0		0
Credits			14 19.0 0.25			18.0 1.25				23.0			20.5			21.0			21			22.5		13.0
۵			14			9				4			တ			9			9			7		0
-			9	\vdash		12 3	irst.			18			16 0			16 2	_		7			7 0		13 0
_			-			_	ster f	П		Ī						_								
Olrse-10	NLN100	Language and Writing Skills-1 (Non-graded)	0 0 2				1-6 of II seme																	
6-esinoO	NEN110	Professional Ethics and Social Responsibility-1 (Non-graded)	0 0 0.5 0.25	NLN101	Language and Writing Skills-2 (Non-graded)	0 0 2 1	ttend the Courses																	
8-asmoJ	NIN100	Introduction to Engineering (Non-graded)	0 0 2 1	NEN	Professional Ethics and Social Responsibility-2 (Non-graded)	0 0 0.5 0.25	The other half of First year students attend the Courses 1-6 of II semester first																	
7-921100	MCP101	Product Realization through Manufacturing	0 0 4 2				The other half of F							APL207	Heat Transfer	2 0 0 2				APD411	B.Tech. Project-I	0 0 8 4		
g-asinoJ	PYP100	Physics Laboratory	0 0 4 2				st year students.	HUL		3 1 0 4	APL206	Engineering Thermodynamics	2 0 0 2	HUL		3 1 0 4	HUL		3 1 0 4	HUL		3 0 0 3		
G-esruoJ	MTL100	Calculus	3 1 0 4	CMP100	Chemistry Laboratory	0 0 4 2	ler by half of all fire	SBL100	Introduction to Biology for Engineers	3 0 2 4	CVL100	Environmental Science	2 0 0 2	APL380	Bio-mechanics	3 0 0 3	APL405	Machine Learning in Mechanics	2 0 2 3	DE2		3 0 0 3	002	3 0 0 3
6-esruoJ	PYL101	Electromagnetism & Quantum Mechanics	3 1 0 4	MTL101	Linear Algebra and Differential Equations	3 1 0 4	ed in the given ord	APL101	Applied Mathematics for Engineers	3 0 0 3	ELL201	Digital Electronics	3 0 3 4.5	APL302	Basics of Product Design	3 0 2 4	100		3 0 0 3	APL 390	Advanced Experiments in Solids & Fluids	2 0 3 3.5	004	2 0 0 2
Course-3	MCP100	Introduction to Engineering Visualization	0 0 4 2	101	Introduction to Chemistry	3 1 0 4	above are attende	APL104	Solid Mechanics	3 1 0 4	MTL107	Numerical Methods and Computations	3 0 0 3	AMP262	Fluids and Solids Laboratory	0 0 4 2	APL311	Introduction to Finite Element Methods	3 0 2 4	APL361	Advanced Fluid Dynamics	3 0 0 3	003	2 0 0 2
Course-2	ELP101	Introduction to Electrical Engineering (Lab.)	0 0 2 1		Introduction to Computer Science	3 0 2 4	Note: Courses 1-6 above are attended in the given order by half of all first year students.	APL106	Fluid Mechanics	3 1 0 4	COL106	Data Structures and Algorithms	3 0 4 5	APL205	Basics of Computer Aided Design	2 0 0 2	APL321	Intro. to Computational Fluid Dynamics	3 0 2 4	APL410	Multi-scale Modeling and Computation	3 0 0 3	DE4	3 0 0 3
Course-1	ELL101	Introduction to Electrical Introduction to Electrical Engineering Engineering (Lab.)	3 1 0 4	APL100	Engineering Mechanics	3 1 0 4		MLL100	Introduction to Materials Science and Engineering	3 0 2 4	APL103	Experimental Methods	3 0 2 4	APL203	Dynamics of Mechanical System	3 1 0 4	APL331	Advanced Mechanics of Solids	3 0 0 3	DE 1		3 0 0 3	DE3	3 0 0 3
Semester		_			=				≡			≥			>			>			₹			

Bachelor of Technology in Biochemical Engineering and Biotechnology Department of Biochemical Engineering and Biotechnology

The over	rall Credit Structure					BBL433	Enzyme Science and Engineering	3	0	2	4
Course (Category	C	red	lits		BBL434	Bioinformatics	2	0	2	3
	Core Courses					BBD451	Major Project Part-I (BB1)	0	0	6	3
	ciences (BS)		24	ı		BBL731	Bioseparation Engineering	3	0	3	4.5
	ring Arts and Science (EAS)		19			BBL732	Bioprocess Plant Design	3	0	2	4
	ies and Social Sciences (HuSS)		15			BBL733	Recombinant DNA Technology	2	0	3	3.5
	me-linked Courses		11			CLL122	Chemical Reaction Engineering-I	3	1	0	4
•	ental Courses					CLL231	Fluid Mechanics for Chemical Engineers	3	1	0	4
_ •	ental Courses		69			CLL251	Heat Transfer for Chemical Engineers	3	1	0	4
•	ental Core ental Electives		10			CLL252	Mass Transfer-I	3	0	0	3
•	itegory Courses		10			CLL261	Process Dynamics and Control	3	1	0	4
	aded Credit requirement		158			CLP301	•	0	0	3	1.5
	ded Units		11				Chemical Engineering Laboratory-II				1.5
Non Gra	ded Offits						Total Credits				69
	Core : Basic Sciences			_		Domontos	antal Electives				
	Introduction to Chemistry		1				ental Electives				
	Chemistry Laboratory		0			BBL341	Environmental Biotechnology	3	0	0	3
	Calculus		1			BBL342	Physical and Chemical Properties of	2	1	0	3
	Linear Algebra and Differential Equations		1				Biomolecules				
	Electromagnetism & Quantum Mechanics		1			BBL343	Carbohydrates and Lipids in Biotechnology	2	1	0	3
PYP100	Physics Laboratory		0			BBV350	Special Module in Biochemical Engineering	1	0	0	1
SBL100	Introductory Biology for Engineers	3	0	2	4		and Biotechnology				
	Total Credits				24	BBD351	Mini Project (BB)	0	0	6	3
						BBL441	Food Science and Engineering	3	0	0	3
Institute	Core: Engineering Arts and Sciences					BBL442	Immunology	3	0	2	4
APL100	Engineering Mechanics	3	1	0	4	BBL443	Modeling and Simulation of Bioprocesses	3	0	2	4
	Introduction to Computer Science		0			BBL444	Advanced Bioprocess Control	3	0	0	3
	Environmental Science		0			BBL445	Membrane Applications in Bioprocessing	3	0	0	3
	Introduction to Electrical Engineering		1			BBL446		3	0	0	3
	Introduction to Electrical Engineering (Lab)		0			BBL447	Enzyme Catalyzed Organic Synthesis	2	0	2	3
	Introduction to Engineering Visualization		0			BBD452	Major Project Part-II (BB1)	0	0	16	86
	Product Realization through Manufacturing		0 .			CLL477	, ,	3	0	0	3
	Total Credits	Ū	Ŭ		<u> </u>	BBL734	Metabolic Regulation and Engineering	3	0	0	3
	Total Credits				13	BBL735		2	0	2	3
Program	me-Linked Basic/Engineering Arts/Science	200	Core	_		BBL736	Dynamics of Microbial Systems		0		
					_	BBL737	Instrumentation and Analytical Methods in	2	0	2	3
MLL100	Introduction to Materials Science	3	0	2	4		Bioengineering				
011440	and Engineering	_		_		BBL740	Plant Cell Technology	3	0	2	4
	Transport Phenomena		1			BBL741	= -	3	0	0	3
MTL102	Differential Equations	3	0	0	3		Biological Waste Treatment		0		
	Total Credits				11		High Resolution Methods in Biotechnology		0		
							Animal Cell Technology		0		
Humanit	ies and Social Sciences						Combinatorial Biotechnology	3	0	0	3
Courses	from Humanities, Social Sciences and Manag	eme	ent				Current Topics in Biochemical Engineering		0		
	nder this category			15	5		and Biotechnology	_	-	_	-
						BBI 747	Bionanotechnology	3	0	0	3
Departm	ental Core						Data Analysis for DNA Microarrays				4
BBI 131	Principles of Biochemistry	3	0	3	4.5		Cancer Cell Biology				4.5
	General Microbiology				4.5		Genome Engineering				3
	Mass and Energy Balances in Biochemical		0			BBL751	0 0				2
DDL 100	Engineering	J		5	5	BBL752	0, 1				3
BBL231		વ	0	3	45	BBL754					3
BBL331	<u> </u>		0			BBL756	Plasmid Biology				3
	Bioprocess Engineering Laboratory		0			BBL757	Electromicrobiology and Bioelectrochemical	3	U	U	3
	Bioprocess Technology		0			CL 1 700	Systems Biomass Conversion and Utilization	2	0	^	2
DDL43Z	Fluid Solid Systems	_	0	U	_	CLL728	DIOMASS CONVERSION AND UTILIZATION	3	0	U	3

B.Tech. in Biochemical Engineering and Biotechnology

Contact Hours			31.0			24.0				29.0			26.0			26.0			20.0			30.0			17.0
Non-graded Unita			2.25			1.25				0			0			0			0			0			0
Credits			19.0			18.0				10 24.0			21.0			21.5			16.5			22.0			2 16.0
Р			14			6				10			0			6			7			16			
-			<u>س</u>			2 3	rst.			7			7			2			7			4			0
			6			12	ter fi			9			17			15			12			14			15
Op-serio	NLN100	Language and Writing Skills-1 (Non-graded)	0 0 2 1				1-6 of II semes																		
6-9sinoJ	NEN110	Professional Ethics and Social Responsibility-1 (Non-graded)	0 0 0.5 0.25	NLN101	Language and Writing Skills-2 (Non-graded)	0 0 2 1	First year students attend the Courses 1-6 of II semester first.																		
8- 9 21100	NIN100	Introduction to Engineering (Non-graded)	0 0 2 1	NEN111	Professional Ethics and Social Responsibility-2 (Non-graded)	0 0 0.5 0.25	First year students																		
		ion	2				ilf of						2		/e-2	4									
Course-7	MCP101	Product Realization through Manufacturing	0 0				The other half of						2 0 0	HUL2XX	Humanities Elective-2	3 1 0									
g-asruoJ	PYP100	Physics Laboratory	0 0 4 2				st year students.	BBL133	Mass and Energy Balances in Biochemical Engg.	3 0 0 3	HUL2XX	Humanities Elective-1	3 1 0 4	BBL331	Bioprocess Engineering	3 0 0 3	BBL431	Bioprocess Technology	2 0 0 2	BBL733	Recombinant DNA Technology	2 0 3 3.5			
G-esruco	MTL100	Calculus	3 1 0 4	CMP100	Chemistry Laboratory	0 0 4 2	Note: Courses 1-6 above are attended in the given order by half of all first year students.	BBL132	General Microbiology	3 0 3 4.5	MTL102	Differential Equations	3 0 0 3	BBP332	Bioprocess Engineering Laboratory	0 0 3 1.5	BBL433	Enzyme Science and Engineering	3 0 2 4	BBL732	Bioprocess Plant Design	3 0 2 4	003 (3)		3 0 0 3
4-asiuoJ	PYL101	Electromagnetism & Quantum Mechanics	3 1 0 4	MTL101	Linear Algebra and Differential Equations	3 1 0 4	ed in the given orc	BBL131	Principles of Biochemistry	3 0 3 4.5	CVL100	Environmental Science	2 0 0 2	CLP301	Chemical Engineering Laboratory-I	0 0 3 1.5	BBL434	Bioinformatics	2 0 2 3	BBL731	Bioseparation Engineering	3 0 3 4.5	0C2 (3)		3 0 0 3
6-921100	MCP100	Introduction to Engineering Visualization	0 0 4 2	CML101	Introduction to Chemistry	3 1 0 4	above are attend	SBL100	Introductory Biology for Engineers	3 0 2 4	CLL231	Fluid Mechanics for Chemical Engineers	3 1 0 4	CLL261	Process Dynamics and Control	3 1 0 4	BBL432	Fluid Solid Systems	2 0 0 2	BED451	B.Tech. Project	0 0 6 3	DE3 (3)		3 0 0 3
C-osruoJ	ELP101	Introduction to Electrical Introduction to Electrical Engineering (Lab.)	0 0 2 1	COL100	Introduction to Computer Science	3 0 2 4	Note: Courses 1-6	CLL110	Transport Phenomena	3 1 0 4	CLL122	Chemical Reaction Engineering-l	3 1 0 4	CLL252	Mass Transfer-I	3 0 0 3	HUL2XX	Humanities Elective-3	3 1 0 4	001 (4)		3 0 2 4	DE2 (3)		3 0 0 3
Course-1	ELL101	oduction to Electrical Engineering	1 0 4	APL100	Engineering Mechanics	1 0 4	-	MLL100	Introduction to Materials Science and Engineering	0 2 4	CLL251	Heat Transfer for Chemical Engineers	1 0 4	BBL231	Molecular Biology and Genetics	0 3 4.5	CLP302	Chemical Engineering Laboratory-II	0 3 1.5	HUL3XX	Humanities Elective-4	0 0 3	DE1 (4)		0 2 4
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Bachelor of Technology in **Chemical Engineering**Department of Chemical Engineering

The overall Credit Structure						CLD414*	Major Project in Process Engineering,	0	0	10	15
Course Category	(Cre	dit	s		CLD415*	Modeling and Optimization Major Project in Biopharmaceuticals	0	0	10	15
Institute Core Courses Basic Sciences (BS)		2	4			OLDTIO	and Fine Chemicals	Ü	Ü	10	
Engineering Arts and Science (EAS)			9			CLL475	Safety and Hazards in Process Industries			0	
Humanities and Social Sciences (HuSS)			5							0	
Programme-linked Courses			7				Natural Gas Processing			0	
Departmental Courses		_	_				Petroleum Reservoir Engineering Petroleum Production Engineering			0	
Departmental Core			7				Population Balance Modeling			0	
Departmental Electives Open Category Courses			2							0	
Total Graded Credit requirement		15				CLL721				0	
Non Graded Units			1			CLL722	Electrochemical Conversion and Storage Devices	3	0	0	3
Institute Core: Basic Sciences							Hydrogen Energy and Fuel Cell Technology			0	
	_	_	^		_		Environmental Engineering and Waste Mgmt.			0	
CML101 Introduction to Chemistry CMP100 Chemistry Laboratory		1					Air Pollution Control Engineering			0	
MTL100 Calculus		1					Molecular Modeling of Catalytic Reactions Heterogeneous Catalysis and Catalytic Reactors			0	
MTL101 Linear Algebra and Differential Equations		1					Biomass Conversion and Utilization			0	
PYL101 Electromagnetism & Quantum Mechanics		1								0	
PYP100 Physics Laboratory		0				CLL730	Structure, Transport and Reactions			0	
SBL100 Introductory Biology for Engineers	3	0	2	4			in BioNano Systems				
Total Credits				2	24		Advanced Transport Phenomena			0	
Institute Core: Engineering Arts and Sciences						CLL732	Advanced Chemical Engineering	3	0	0	3
APL100 Engineering Mechanics	3	1	n	4		CLL733	Thermodynamics Industrial Multiphase Reactors	2	0	0	2
COL100 Introduction to Computer Science		0					Process Intensification and Novel Reactors			0	
CVL100 Environmental Science		0								0	
ELL101 Introduction to Electrical Engineering		1					Experimental Characterization of			0	
ELP101 Introduction to Electrical Engineering (Lab)		0					Multiphase Reactors				
MCP100 Introduction to Engineering Visualization		0				CLL742	Experimental Characterization	3	0	0	3
MCP101 Product Realization through Manufacturing	U	0	4				of BioMacromolecules			_	_
Total Credits				7	19		Petrochemicals Technology			0	
Programme-Linked Basic/Engineering Arts/Science	es	Со	re				Crystal Engineering and Design Chemical Engineering Mathematics			0	
MLL100 Introduction to Materials Science	3	0	2	4			Advanced Computational Techniques			2	
and Engineering	_		_	_		OLLIOZ	in Chemical Engineering	_	Ü	_	Ŭ
CML103 Applied Chemistry - Chemistry at Interfaces	3	0	0			CLL766	Interfacial Engineering	3	0	0	3
Total Credits				7	,	CLL767	Structures and Properties of Polymers			0	
Humanities and Social Sciences						CLL768	Fundamentals of Computational Fluid Dynamics			2	
Courses from Humanities, Social Sciences and Manage	eme	ent				CLL769	Applications of Computational Fluid Dynamics			2	
offered under this category			1	5		CLL770 CLL771	Introduction to Microfluidics and Microfabrication Introduction to Complex Fluids	-	_	0	_
Departmental Core							Transport Phenomena in Complex Fluids			0	
	2	4	^	- 4			Thermodynamics of Complex Fluids			0	
CLL110 Transport Phenomena CLL111 Material and Energy Balances		1 2				CLL774	Simulation Techniques for Complex Fluids	3	0	0	3
CLL113 Numerical Methods in Chemical Engineering		0				CLL775	Polymerization Process Modeling			0	
CLL121 Chemical Engineering Thermodynamics		1				CLL776	Granular Materials			0	
CLL122 Chemical Reaction Engineering-I	3	1	0	4	ļ	CLL777	Complex Fluids Technology			0	
CLL141 Intro. to Materials for Chemical Engineers	3	0	0	3	3	CLL778	Interfacial Behaviour and Transport of Biomolecules	3	U	0	3
CLL222 Chemical Reaction Engineering-II		0				CLL779	Molecular Biotechnology and in-vitro Diagnostics	3	0	0	3
CLL231 Fluid Mechanics for Chemical Engineers		1					Bioprocessing and Bioseparations			0	
CLL251 Heat Transfer for Chemical Engineers CLL252 Mass Transfer-I		1				CLL781	Process Operations Scheduling			0	
CLL232 Mass Transler-1 CLL261 Process Dynamics and Control		1				CLL782	Process Optimization	3	0	0	3
CLL271 Introduction to Industrial Biotechnology		0				CLL783	Advanced Process Control			0	
CLP301 Chemical Engineering Laboratory-I		0				CLL784	Process Modeling and Simulation			0	
CLP302 Chemical Engineering Laboratory-II	0	0	3	1	.5	CLL785	Evolutionary Optimization			0	
CLP303 Chemical Engineering Laboratory-III	0	0	3	1	.5	CLL786 CLL787	Fine Chemicals Technology Statistical Methods for Chemical Engineering			0	
CLL331 Fluid-Particle Mechanics		1					Process Data Analytics			0	
CLL352 Mass Transfer-II		1					Applied Time Series Analysis for Chemical Engg.			0	
CLL361 Instrumentation and Automation CLL371 Chemical Process Technology and Economics		0				CLL791	Chemical Product and Process Integration			0	
CLD411 B.Tech. Project		0				CLL792	Chemical Product Development	3	0	0	3
Total Credits	,	•	•		57		and Commercialization	_			
				٠			Membrane Science and Engineering			0	
Departmental Electives	-		_	_	_		, , ,			0	
CLL133 Powder Processing and Technology		0					Current Topics in Chemical Engineering			0	
CLL296 Nano-engineering of Soft Materials		0					Recent Advances in Chemical Engineering Selected Topics in Chemical Engineering-I			0	
CLL390 Process Utilities and Pipeline Design CLL402 Process Plant Design		0					Selected Topics in Chemical Engineering-II			0	
CLD412* Major Project in Energy and Environment		0						-	-	-	Ī
CLD413* Major Project in Complex Fluids		0				*Student ca	an take any one of these course.				
,,	-	-		. •							

Total = 154.0

B.Tech. in Chemical Engineering

Contact Hours			31.0			24.0				20.0			26.0			22.0			25.0			25.0		12.0
Non-graded Units			2.25			1.25				0			0			0			0			0		0
StiberO			19.0			18.0				19.0			24.0			20.5			22.5			19.5		12.0
۵			14			9				7			4			က			9			1		0
			9			12 3	irst.			14 4			18 4			17 2			16 3			12 2		12 0
Ot-aziuoJ	NLN100	Language and Writing Skills-1 (Non-graded)	0 0 2 1				-6 of II semester f																	
6-asruoJ	NEN110	Professional Ethics and Social Responsibility-1 (Non-graded)	0 0 0.5 0.25	NLN101		0 0 2 1	tend the Courses 1																	
8-92YUOJ	NIN100	Introduction to Engineering (Non-graded)	0 0 2 1	NEN111	cial (0 0 0.5 0.25	The other half of First year students attend the Courses 1-6 of II semester first.																	
7-esinoJ	MCP101	Product Realization through Manufacturing	0 0 4 2				he other half of Fi							CLP301	Chemical Engineering Laboratory-I	0 0 3 1.5	CLP302	Chemical Engineering Laboratory-II	0 0 3 1.5					
g-asinoJ	PYP100	Physics Laboratory	0 0 4 2				f of all first year students. T				MLL100	Introduction to Materials Science and Engineering	3 0 2 4	CVL100	Environmental Science	2 0 0 2	HUL2XX		3 1 0 4	HUL2XX		3 1 0 4		
g-asino)	MTL100	Calculus	3 1 0 4	CMP100	emistry Laborato	0 0 4 2		HUL2XX		3 1 0 4	SBL100	Introductory Biology for Engineers	3 0 2 4	CLL261	Process Dynamics and Control	3 1 0 4	CLL361	Instrumentation and Automation	1 0 3 2.5	CLD411	B.Tech. Project	0 0 8 4		
4-asiuoJ	PYL101	Electromagnetism & Quantum Mechanics	3 1 0 4	MTL101	inear Alge ferential E	3 1 0 4	d in the given ord	CML103	Applied Chemistry: Chemistry at Interfaces	3 0 0 3	CLL251	Heat Transfer for Chemical Engineers	3 1 0 4	CLL141	Introduction to Materials for Chemical Engineers	3 0 0 3	CLL371	Chemical Process Technology and Economics	3 1 0 4	CLP303	Chemical Engineering Laboratory-III	0 0 3 1.5	HUL3XX	3 0 0 3
Course-3	MCP100	Introduction to Engineering Visualization	0 0 4 2	CML101	Introduction to Chemistry	3 1 0 4	above are attende	CLL113	Numerical Methods in Chemical Engineering	3 0 2 4	CLL231	Fluid Mechanics for Chemical Engineers	3 1 0 4	CLL331	Fluid-Particle Mechanics	3 1 0 4	CLL271	Introduction to Industrial Biotechnology	3 0 0 3	0C 2		3 1 0 4	0C 3	3 0 0 3
Course-2	ELP101	Introduction to Electrical Engineering (Lab.)	0 0 2 1	COL100	Introduction t Scier	3 0 2 4	Note: Courses 1-6 above are attended in the given order by hal	CLL111	Material and Energy Balances	2 2 0 4	CLL122	Chemical Reaction Engineering-l	3 1 0 4	CLL222	Chemical Reaction Engineering-II	3 0 0 3	DE 1		3 0 0 3	DE 3 / OC 1		3 0 0 3	DE 4	3 0 0 3
f-serinoJ	ELL101	Introduction to Electrical Engineering	3 1 0 4	APL100	Engineering N	3 1 0 4		CLL110	Transport Phenomena	3 1 0 4	CLL121	Chemical Engineering Thermodynamics	3 1 0 4	CLL252	Mass Transfer-I	3 0 0 3	CLL352	Mass Transfer-II	3 1 0 4	DE 2		3 0 0 3	0C1 / DE 3	3 0 0 3
Semester		_			=				≡			≥			>			=			₹		l	

Dual Degree Programme: Bachelor of Technology and Master of Technology in **Chemical Engineering**Department of Chemical Engineering

The over Course C	all Credit Structure	_	red	i+-		CLL361 CLL371	Instrumentation and Automation Chemical Process Technology and Economics				2. ! 4
B.Tech. F		·	. eu	ı	•		Total Credits	-	-	-	63
Institute	Core Courses										
	iences (BS)		24			Departm	ental Electives				
	ring Arts and Science (EAS)		19			CLL133	Powder Processing and Technology				3
	es and Social Sciences (HuSS)		15			CLL296	5 5				3
•	me-linked Courses		7			CLL390	, ,				3
•	ental Courses ental Core		63				Process Plant Design				3
•	ental Core ental Electives		09				Safety and Hazards in Process Industries				3
•	tegory Courses		3			CLL477					3
•	ech. Credit Requirement		140			CLL 704	Natural Gas Processing Petroleum Reservoir Engineering				3
	ded Units		11				Petroleum Production Engineering				3
M.Tech. I	Part					CLL707					3
Program	me Core Courses		33				Principles of Electrochemical Engineering				3
Program	me Elective Courses		12			CLL721					3
Open Ele			3			CLL722					3
	ech. Credit Requirement		48				Devices				
Grand To	otal Credit Requirement		188			CLL723	Hydrogen Energy and Fuel Cell Technology	3	0	0	3
nstitute	Core: Basic Sciences					CLL724	Environmental Engineering and Waste	3	0	0	3
	Introduction to Chemistry	2	1	^	1		Management				
	Chemistry Laboratory		0				Air Pollution Control Engineering				3
	Calculus		1			CLL726	o ,				3
	Linear Algebra and Differential Equations		1			CLL727	, ,				
	Electromagnetism & Quantum Mechanics		1			CLL728		-	-	-	3
	Physics Laboratory	0	0 .	4	2		Colloids and Aerosols				3
SBL100	Introductory Biology for Engineers		0			CLL730	, ·	3	0	0	3
	Total Credits				24	CL 1 700	in BioNano Systems	2	^	^	2
						CLL/32	Advanced Chemical Engineering Thermodynamics	3	0	U	3
nstitute	Core: Engineering Arts and Sciences					CLL734		3	Λ	Λ	3
APL100	Engineering Mechanics	3	1	0	4	CLL735					3
COL100	Introduction to Computer Science	3	0	2	4		Experimental Characterization				3
	Environmental Science	2	0	0	2	OLLIOO	of Multiphase Reactors	Ū	Ŭ	Ŭ	Ů
	Introduction to Electrical Engineering		1			CLL742	Experimental Characterization	3	0	0	3
	Introduction to Electrical Engineering (Lab)		0				of BioMacromolecules				
	Introduction to Engineering Visualization		0			CLL743	Petrochemicals Technology	3	0	0	3
MCP101	Product Realization through Manufacturing	0	0	4	2	CLL760	Crystal Engineering and Design	3	0	0	3
	Total Credits				19	CLL761	Chemical Engineering Mathematics	3	0	0	3
						CLL762	Advanced Computational Techniques	2	0	2	3
	me-Linked Basic/Engineering Arts/Science						in Chemical Engineering				
	Introduction to Materials Science and Engineering					CLL766	5 5				3
CML103	Applied Chemistry - Chemistry at Interfaces	3	0	0	3		Structures and Properties of Polymers				3
	Total Credits				7		Fundamentals of Computational Fluid Dynamics				
						CLL769					
lumaniti	ies and Social Sciences					CLL770	Introduction to Microfluidics and Microfabrication				
	from Humanities, Social Sciences and Manage	me	nt			CLL771	Introduction to Complex Fluids				3
ffered ur	nder this category				15	CLL772	·				3
lonert	ental Care					CLL773 CLL774	Thermodynamics of Complex Fluids Simulation Techniques for Complex Fluids				3
	ental Core			_		CLL774	Polymerization Process Modeling				3
	Transport Phenomena		1			CLL775	,				3
LL111	Material and Energy Balances		2			CLL777					3
CLL113	Numerical Methods in Chemical Engineering		0			CLL778	Interfacial Behaviour and Transport of				3
CLL121 CLL122	Chemical Engineering Thermodynamics Chemical Reaction Engineering-I		1 1			5	Biomolecules	Ü	,	•	٠
	o o					CLL779	Molecular Biotechnology and in-vitro Diagnostics	3	0	0	3
LL141	Introduction to Materials for Chemical Engineers	3	0	U	J	CLL780	Bioprocessing and Bioseparations				3
LL222	Chemical Reaction Engineering-II	3	0	n	3	CLL781					3
CLL231	Fluid Mechanics for Chemical Engineers		1				Process Optimization				3
CLL251	Heat Transfer for Chemical Engineers		1			CLL783	Advanced Process Control				3
CLL252	Mass Transfer-I		0			CLL784	Process Modeling and Simulation	3	0	0	3
CLL261	Process Dynamics and Control		1			CLL785		3	0	0	3
	Introduction to Industrial Biotechnology		0			CLL786					3
JLLZ/ I	5 ,				1.5	CLL787	Statistical Methods for Chemical Engineering			0	3
	Chemical Engineering Laboratory-I	-									
CLP301	Chemical Engineering Laboratory-I		0	3	1.5	CLL788	•				3
CLP303	Chemical Engineering Laboratory-II Chemical Engineering Laboratory-III	0 0	0	3	1.5	CLL788 CLL789	Applied Time Series Analysis for Chemical				3
CLP301 CLP302	Chemical Engineering Laboratory-II	0 0 3		3	1.5 4		Applied Time Series Analysis for Chemical Engineering	3	0	0	

CLL792	Chemical Product Development	3	0	0	3	CLL742	Experimental Characterization	3	0	0	3
	and Commercialization						of BioMacromolecules				
	Membrane Science and Engineering		0				Petrochemicals Technology			0	
	Petroleum Refinery Engineering		0			CLL760	Crystal Engineering and Design	3	0	0	3
	Current Topics in Chemical Engineering		0			CLL761	Chemical Engineering Mathematics	3	0	0	3
	Recent Advances in Chemical Engineering		0			CLL762	Advanced Computational Techniques	2	0	2	3
	Selected Topics in Chemical Engineering-I		0				in Chemical Engineering				
CLL799	Selected Topics in Chemical Engineering-II	3	0	0	3	CLL766	Interfacial Engineering	3	0	0	3
Program	Core					CLL767	Structures and Properties of Polymers			0	
	Process Engineering	3	0	Λ	3	CLL768	Fundamentals of Computational Fluid	2	0	2	3
	Advanced Transport Phenomena		0				Dynamics				
	Industrial Multiphase Reactors		0			CLL769	Applications of Computational Fluid	2	0	2	3
	Minor Project		0				Dynamics				
CLD881	Major Project Part-I		0			CLL771		3		0	-
					112	CLL772	Transport Phenomena in Complex Fluids	3		0	
OLDOOZ	, ,	U	U			CLL773	Thermodynamics of Complex Fluids	3		0	
	Total Credits				33	CLL774	Simulation Techniques for Complex Fluids			0	
Drogram	Electives					CLL775	Polymerization Process Modeling	3	0	0	3
		_	_	^		CLL776	Granular Materials	3	0	0	3
	Natural Gas Processing		0			CLL777	Complex Fluids Technology	3	0	0	3
	Petroleum Reservoir Engineering		0			CLL778	Interfacial Behaviour and Transport	3	0	0	3
	Petroleum Production Engineering		0				of Biomolecules				
CLL707 CLL720	Population Balance Modeling		0			CLL779	Molecular Biotechnology and in-vitro	3	0	0	3
CLL720 CLL721	Principles of Electrochemical Engineering Electrochemical Methods		0				Diagnostics				
CLL721	Electrochemical Conversion and Storage		0			CLL780	Bioprocessing and Bioseparations	3	0	0	3
CLL122	Devices	3	U	U	3	CLL781	Process Operations Scheduling	3	0	0	3
CLL723	Hydrogen Energy and Fuel Cell Technology	3	0	Λ	3	CLL782	Process Optimization	3	0	0	3
CLL723	Environmental Engineering and Waste		0			CLL783	Advanced Process Control	3	0	0	3
OLL! ZT	Management Waste	0	U	U	0	CLL784	Process Modeling and Simulation	3	0	0	3
CLI 725	Air Pollution Control Engineering	3	0	Λ	3	CLL785	Evolutionary Optimization			0	
	Molecular Modeling of Catalytic Reactions		0			CLL786	Fine Chemicals Technology			0	
CLL727	Heterogeneous Catalysis and Catalytic		0			CLL787	Statistical Methods for Chemical Engineering	3	0	0	3
022. 2 .	Reactors	·	•	Ĭ	•	CLL788	Process Data Analytics			0	
CLL728	Biomass Conversion and Utilization	3	0	0	3	CLL789	Applied Time Series Analysis for Chemical	3	0	0	3
	Colloids and Aerosols	-	0	_	-		Engineering				
	Structure, Transport and Reactions		0			CLL791	Chemical Product and Process Integration	3	0	0	3
	in BioNano Systems					CLL792	Chemical Product Development	3	0	0	3
CLL732	Advanced Chemical Engineering	3	0	0	3		and Commercialization				
	Thermodynamics					CLL793	Membrane Science and Engineering	3		0	
CLL734	Process Intensification and Novel Reactors	3	0	0	3	CLL794	Petroleum Refinery Engineering	3		0	
	Design of Multicomponent Separation	3	0	0	3	CLV796	Current Topics in Chemical Engineering	1	0	0	1
	Processes					CLV797	Recent Advances in Chemical Engineering	2	0	0	2
CLL736	Experimental Characterization	3	0	0	3	CLL798	Selected Topics in Chemical Engineering-I	3	0	0	3
	of Multiphase Reactors					CLL799	Selected Topics in Chemical Engineering-II	3	0	0	3

Total = 188.0

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Bachelor of Technology in **Civil Engineering**Department of Civil Engineering

_	all Credit Structure						ental Electives	_	^	~
	Category Core Courses	C	red	lits		CVL284	Fundamentals of Geographic Information Systems	2	0	2
	iences (BS)		24			C\/I 311	Industrial Waste Management	3	0	Λ
	ring Arts and Science (EAS)		19				Environmental Assessment Methodologies		0	
	ies and Social Sciences (HuSS)		15	;			Air and Noise Pollution		0	
Program	me-linked Courses		10)			Construction Project Management		0	
•	ental Courses						Introduction to Railway Engineering		0	
•	ental Core		66				Groundwater		0	
	ental Electives		14				Water Resources Systems		0	
•	tegory Courses		10				Urban Hydrology		0	
	ided Credit requirement ded Units		158 11				Frequency Analysis in Hydrology		0	
Non Gra	ded Offits		"				Fundamentals of Remote Sensing		0	
nstitute	Core: Basic Sciences					CVD412	B.Tech. Project Part-II	0	0	12
CML101	Introduction to Chemistry	3	1 (0 4	4	CVL421	Ground Engineering	3	0	0
	Chemistry Laboratory		0 4			CVL422	Rock Engineering	3	0	0
	Calculus	3	1 (0 4	4	CVL423	Soil Dynamics	3	0	0
	Linear Algebra and Differential Equations		1 (CVL424	Environmental Geotechniques & Geosyntheses	3	0	0
	Electromagnetism & Quantum Mechanics		1 (CVL431	Design of Foundations & Retaining	3	0	0
	Physics Laboratory		0 4				Structures			
SBL100	Introductory Biology for Engineers	3	0 2			CVL432	Stability of Slopes		0	
	Total Credits			2	24		FEM in Geotechnical Engineering		0	
netituto	Core: Engineering Arts and Sciences						Geotechnical Design Studio		0	
		_	4 4		_		Underground Structures		0	
	Engineering Mechanics		1 (Structural Design		0	
	Introduction to Computer Science Environmental Science		0 2				Structural Analysis-III		0	
	Introduction to Electrical Engineering		1 (Prestressed Concrete & Industrial Structures			
	Introduction to Electrical Engineering (Lab)		0 2				Logistics and Freight Transport		0	
	Introduction to Engineering Visualization		0 4				Introduction to Intelligent Transportation Systems			
	Product Realization through Manufacturing	0	0 4	4 2	2		Water Resources Management		0	
	Total Credits			1	19		Water Power Engineering		0	
							Groundwater & Surface-water Pollution		0	
Program	me-Linked Basic/Engineering Arts/Science	es (Core	е			Computational Aspects in Water Resources		0	
								_	0	2
APL107	Mechanics of Fluids	3	1 :	2 5	5		River Mechanics		^	2
	Mechanics of Fluids Mechanics of Solids		1 2			CVL486	Geo-informatics	2	0	
				2 5		CVL486 CVL721	Geo-informatics Solid Waste Engineering	2	0	0
APL108	Mechanics of Solids Total Credits			2 5	5	CVL486 CVL721 CVL724	Geo-informatics Solid Waste Engineering Environmental systems analysis	2 3 3	0	0 0
APL108	Mechanics of Solids			2 5	5	CVL486 CVL721 CVL724 CVL727	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment	2 3 3 3	0 0 0	0 0 0
APL108 Humaniti Courses 1	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and			2 5	5 10	CVL486 CVL721 CVL724 CVL727 CVL728	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling	2 3 3 3 3	0 0 0	0 0 0 0
APL108 Humaniti Courses 1	Mechanics of Solids Total Credits ies and Social Sciences			2 5	5	CVL486 CVL721 CVL724 CVL727 CVL728	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of	2 3 3 3 3	0 0 0	0 0 0 0
APL108 Humaniti Courses t Managen	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and nent offered under this category			2 5	5 10	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling	2 3 3 3 3 3	0 0 0 0	0 0 0 0 2
APL108 Humaniti Courses 1 Managen Departm	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and nent offered under this category ental Core	3	1 :	2 5	5 10 15	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements	2 3 3 3 3 3	0 0 0 0 0	0 0 0 2 2
Humaniti Courses 1 Managen Departm	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and nent offered under this category ental Core Elements of Surveying	3	0 2	2 5	5 10 15	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL741	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning	2 3 3 3 3 3 3	0 0 0 0 0	0 0 0 2 2
Humaniti Courses I Managen Departme CVL111 CVL121	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and nent offered under this category ental Core Elements of Surveying Engineering Geology	3 3 3	0 2 0 0	2 5 1 2 4 0 3	5 10 15 4	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering	2 3 3 3 3 3 3 3	0 0 0 0 0	0 0 0 0 2 2
Humaniti Courses 1 Managen Departm CVL111 CVL121 CVP121	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and nent offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Lab	3 3 0	0 2 0 0 0 0 2	2 5 1 2 4 0 3 2 1	5 10 15 4 3 1	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL744	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design	2 3 3 3 3 3 3 3 2	0 0 0 0 0	0 0 0 2 2 2 0 2
Humaniti Courses I Managen Departm CVL111 CVL121 CVP121 CVL141	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and nent offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Lab Civil Engineering Materials	3 3 0 3	0 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 5 1 1 1 2 4 0 3 2 1 0 3	5 10 15 4 3 1 3	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL744 CVL746	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design Transportation Infrastructure Design	2 3 3 3 3 3 3 3 3 2 3	0 0 0 0 0 0 0 0	0 0 0 2 2 2 0 2
Humaniti Courses of Manager Departm CVL111 CVL121 CVP121 CVP121 CVL141 CVL212	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and nent offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Lab Civil Engineering Materials Environmental Engineering	3 3 3 0 3 3	0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 :	2 5 1 1 1 2 4 0 3 2 1 0 3 2 4	5 10 15 4 3 1 3 4	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL744 CVL746	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design Transportation Infrastructure Design Public Transportation Systems	2 3 3 3 3 3 3 3 3 2 3	0 0 0 0 0 0 0 0	0 0 0 2 2 2 0 2
Humaniti Courses t Managem Departm CVL111 CVL121 CVP121 CVP121 CVL141 CVL212 CVL222	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and ment offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Lab Civil Engineering Materials Environmental Engineering Soil Mechanics	3 3 0 3 3 3 3	0 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 5 1 1 2 4 0 3 2 1 0 2 4 0 3 3 4 0 3 3 4 0 3 3 4 0 3 3 4 0 3 3 4 0 3 3 4 0 3 3 4 0 3 3 4 0 0 3 4 0 0 3 4 0 0 3 4 0 0 3 4 0 0 3 4 0 0 3 4 0 0 3 4 0 0 3 4 0 0 3 4 0 0 3 4 0 0 3 4 0 0 3 4 0 0 3 4 0 0 0 3 4 0 0 3 4 0 0 0 3 4 0 0 0 0	5 10 15 4 3 1 3 4 3	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL744 CVL746 CVL763	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design Transportation Infrastructure Design Public Transportation Systems Analytical and Numerical Methods for	2 3 3 3 3 3 3 3 3 2 3	0 0 0 0 0 0 0 0 0	0 0 0 2 2 2 0 2
Humaniti Courses t Managem Departm CVL111 CVL121 CVP121 CVL141 CVL121 CVL122 CVL222 CVP222	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and ment offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Lab Civil Engineering Materials Environmental Engineering Soil Mechanics Soil Mechanics Lab	3 3 0 3 3 0	0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 :	2 5 1 1 2 4 2 0 3 1 0 0 3 2 1	5 10 15 4 3 1 3 4 3 1	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL744 CVL746 CVL763	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design Transportation Infrastructure Design Public Transportation Systems Analytical and Numerical Methods for Structural Engineering	2 3 3 3 3 3 3 3 2 3 3 3 3	0 0 0 0 0 0 0 0 0	0 0 0 2 2 2 0 2 0 0
Humaniti Courses (Manager Departm CVL111 CVL121 CVP121 CVL141 CVL212 CVL222 CVP222 CVP222 CVL242	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and nent offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Lab Civil Engineering Materials Environmental Engineering Soil Mechanics Soil Mechanics Lab Structural Analysis-I	3 3 3 0 3 3 3 0 3	0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 :	2 5 1 1 2 4 0 3 3 2 0 3 2 0 3 1 0 3 3 1	5 10 15 4 3 1 3 4 3 1 3 1 3	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL744 CVL765 CVL765 CVL766	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design Transportation Infrastructure Design Public Transportation Systems Analytical and Numerical Methods for Structural Engineering Concrete Mechanics	2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3		0 0 0 2 2 2 0 2 0 0
Humaniti Courses (Manager Departm CVL111 CVL121 CVP121 CVL141 CVL212 CVL22 CVP222 CVP222 CVP222 CVP242	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and ment offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Lab Civil Engineering Materials Environmental Engineering Soil Mechanics Soil Mechanics Lab	3 3 3 0 3 3 3 0 3 0	0 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 5 1 2 4 2 0 3 1 2 0 3 2 1 0 0 3 2 1	5 10 15 4 3 1 3 4 3 1 3 1	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL744 CVL763 CVL765 CVL766 CVL768	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design Transportation Infrastructure Design Public Transportation Systems Analytical and Numerical Methods for Structural Engineering Concrete Mechanics Design of Bridge Structures	2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3		0 0 0 0 2 2 2 0 0 0 0 0
Humaniti Courses Manager Manager CVL111 CVL121 CVV121 CVV122 CVV222 CVV222 CVV224 CVV242 CVV243 CVV243	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and ment offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Lab Civil Engineering Materials Environmental Engineering Soil Mechanics Soil Mechanics Lab Structural Analysis-I Structural Analysis Lab RC Design Structures & Material (Concrete) Lab	3 3 3 0 3 3 0 3 0 3 0 3	0 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 5 1 2 4 3 2 0 3 1 3 2 0 3 1 3 2 0 3 1 3 2 0 3 1	5 10 15 4 3 1 3 4 3 1 3 1 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 4 3 3 3 3	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL746 CVL763 CVL765 CVL766 CVL768 CVL769	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design Transportation Infrastructure Design Public Transportation Systems Analytical and Numerical Methods for Structural Engineering Concrete Mechanics Design of Bridge Structures Design of Masonry Structures	2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3		0 0 0 2 2 2 0 0 0 0 0
APL108 Humaniti Courses of Manager Departm CVL111 CVL121 CVP121 CVL141 CVL22 CVP222 CVP222 CVP222 CVP242 CVP243 CVP243 CVP243 CVP244	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and ment offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Lab Civil Engineering Materials Environmental Engineering Soil Mechanics Soil Mechanics Lab Structural Analysis-I Structural Analysis Lab RC Design Structures & Material (Concrete) Lab Construction Practices	3 3 3 0 3 3 0 3 0 3 0 2	0 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 5 1 1 2 4 3 3 1 2 2 0 2 3 3 1 3 0 2 2 0 3 3 0 2 2 0 3 1	5 10 15 4 3 3 1 3 3 1 3 1 3 1 3 2	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL746 CVL763 CVL765 CVL766 CVL768 CVL769 CVL770	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design Transportation Infrastructure Design Public Transportation Systems Analytical and Numerical Methods for Structural Engineering Concrete Mechanics Design of Bridge Structures Design of Masonry Structures Design of Tall Buildings	2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3		0 0 0 0 2 2 2 0 2 0 0 0 0 0 0
APL108 Humaniti Courses Managen Operation CVL111 CVL121 CVL121 CVL222 CVL222 CVL222 CVL242 CVL243 CVP243 CVP243 CVP243	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and nent offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Lab Civil Engineering Materials Environmental Engineering Soil Mechanics Soil Mechanics Lab Structural Analysis-I Structural Analysis Lab RC Design Structures & Material (Concrete) Lab Construction Practices Construction Management	3 3 3 0 3 3 0 3 0 2 2	0 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 5 1 1 2 4 3 3 1 3 2 2 0 3 3 1 2 2 0 3 3 0 0 2 2 0 3 1 3 1 2 2 0 3 1 3 1 2 2 1 3 1 3 1 2 2 1 3 1 3 1 2 2 1 3 1 3	5 10 15 4 3 3 1 3 3 1 3 1 3 1 5 2 2 2	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL746 CVL763 CVL765 CVL766 CVL768 CVL769 CVL770 CVL771	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design Transportation Infrastructure Design Public Transportation Systems Analytical and Numerical Methods for Structural Engineering Concrete Mechanics Design of Bridge Structures Design of Masonry Structures Design of Tall Buildings Prestressed and Composite Structures	2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	000000000000000000000000000000000000000	0 0 0 0 2 2 2 0 0 0 0 0 0 0 0 0 0
APL108 dumaniti Courses Managen Departm CVL111 CVL121 CVL121 CVL141 CVL22 CVL222 CVL222 CVL242 CVL243 CVL243 CVL244 CVL245 CVL261	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and nent offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Lab Civil Engineering Materials Environmental Engineering Soil Mechanics Soil Mechanics Lab Structural Analysis-I Structural Analysis Lab RC Design Structures & Material (Concrete) Lab Construction Practices Construction Management Introduction to Transportation Engineering	3 3 3 0 3 3 0 3 0 3 0 2 2 2 3	0 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 5 1 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	55 110 115 4 4 3 3 1 1 3 3 4 4 3 3 1 1 3 3 1 1 . 5 2 2 2 2 3 3	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL746 CVL763 CVL765 CVL766 CVL768 CVL769 CVL770 CVL771	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design Transportation Infrastructure Design Public Transportation Systems Analytical and Numerical Methods for Structural Engineering Concrete Mechanics Design of Bridge Structures Design of Masonry Structures Design of Tall Buildings Prestressed and Composite Structures Advanced Concrete Technology Environmental impact assessment	2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	000000000000000000000000000000000000000	0 0 0 0 2 2 2 0 2 0 0 0 0 0 0 0 0 0 0 0
APL108 dumaniti Courses Managen Departm CVL111 CVL121 CVL121 CVL222 CVL222 CVL222 CVL242 CVL243 CVL244 CVL243 CVL245 CVL261 CVP261	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and nent offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Lab Civil Engineering Materials Environmental Engineering Soil Mechanics Soil Mechanics Lab Structural Analysis-I Structural Analysis Lab RC Design Structures & Material (Concrete) Lab Construction Practices Construction Management Introduction to Transportation Engineering Transportation Engineering Lab	3 3 3 0 3 3 0 3 0 2 2 2 3 0		2 5 1 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	5	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL746 CVL763 CVL765 CVL766 CVL768 CVL769 CVL770 CVL771	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design Transportation Infrastructure Design Public Transportation Systems Analytical and Numerical Methods for Structural Engineering Concrete Mechanics Design of Bridge Structures Design of Masonry Structures Design of Tall Buildings Prestressed and Composite Structures Advanced Concrete Technology Environmental impact assessment Emerging Technologies for Environmental	2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	00000 00000 000000	0 0 0 0 2 2 2 0 0 0 0 0 0 0 0 0 0
APL108 Humaniti Courses of Manager Operation CVL111 CVL121 CVP121 CVL22 CVL22 CVL242 CVL242 CVL243 CVL243 CVL245 CVL245 CVL245 CVL245 CVL261 CVP261	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and nent offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Lab Civil Engineering Materials Environmental Engineering Soil Mechanics Soil Mechanics Lab Structural Analysis-I Structural Analysis-Lab RC Design Structures & Material (Concrete) Lab Construction Practices Construction Management Introduction to Transportation Engineering Transportation Engineering Lab Hydraulics	3 3 3 3 0 3 3 0 3 0 3 0 2 2 2 3 0 3 0 3	0 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 5 1 2 4 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3	5 110 15 4 3 3 1 3 3 4 3 3 1 3 3 1 1 3 3 1 1 3 3 1 1 3 3 1 1 3 3 1 1 3 3 1 1 3 3 1 1 3 3 1 1 1 3 3 1 1 1 3 3 1 1 1 3 3 1 1 1 3 1 1 1 1 1 1 1 1 1 1	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL746 CVL763 CVL765 CVL766 CVL768 CVL769 CVL770 CVL771 CVL820 CVL822	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design Transportation Infrastructure Design Public Transportation Systems Analytical and Numerical Methods for Structural Engineering Concrete Mechanics Design of Bridge Structures Design of Masonry Structures Design of Tall Buildings Prestressed and Composite Structures Advanced Concrete Technology Environmental impact assessment	2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3		0 0 0 0 2 2 2 0 0 0 0 0 0 0 0 0
APL108 dumaniti Courses of Manager Departm CVL111 CVL121 CVL121 CVL22 CVL222 CVL242 CVL242 CVL243 CVP243 CVP243 CVP245 CVL246 CVL261 CVP261 CVP281	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and nent offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Engineering Materials Environmental Engineering Soil Mechanics Soil Mechanics Lab Structural Analysis-I Structural Analysis-Lab RC Design Structures & Material (Concrete) Lab Construction Practices Construction Management Introduction to Transportation Engineering Transportation Engineering Lab Hydraulics Hydraulics Lab	3 3 0 3 3 0 3 0 2 2 3 0 3 0	0 2 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 5 1 2 4 3 1 3 1 2 2 3 1 3 1 2 2 3 1 3 1 2 2 3 1 3 1	5 110 15 4 3 3 1 3 4 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 1 1 1 1 1 1 1 1	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL746 CVL763 CVL765 CVL766 CVL768 CVL769 CVL770 CVL771 CVL820 CVL822	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design Transportation Infrastructure Design Public Transportation Systems Analytical and Numerical Methods for Structural Engineering Concrete Mechanics Design of Bridge Structures Design of Masonry Structures Design of Tall Buildings Prestressed and Composite Structures Advanced Concrete Technology Environmental impact assessment Emerging Technologies for Environmental Management	2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	00000 000000 000000 0	0 0 0 0 2 2 2 0 0 0 0 0 0 0 0 0 0 0 0 0
APL108 Humaniti Courses of Manager Operation CVL111 CVL121 CVP121 CVL212 CVL22 CVL242 CVL242 CVL243 CVP242 CVL243 CVP245 CVL245 CVP2461 CVP261 CVP261 CVP281 CVP281	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and nent offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Lab Civil Engineering Materials Environmental Engineering Soil Mechanics Soil Mechanics Lab Structural Analysis-I Structural Analysis-Lab RC Design Structures & Material (Concrete) Lab Construction Practices Construction Management Introduction to Transportation Engineering Transportation Engineering Lab Hydraulics Hydraulics Lab Engineering Hydrology	3 3 3 3 3 3 3 3 0 3 0 3 0 3 0 3 0 3 0 3	0 2 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 2 3 1 2 2 3 2 3 3 3 2 2 3 3 3 2 2 3 3 3 3	5 110 15 4 3 3 1 3 3 4 4 3 3 1 1 3 3 1 1 5 2 2 2 3 3 1 1 4 4 1 4 4 4 4	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL746 CVL763 CVL765 CVL766 CVL768 CVL769 CVL770 CVL771 CVL820 CVL822 CVL823 CVL824	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design Transportation Infrastructure Design Public Transportation Systems Analytical and Numerical Methods for Structural Engineering Concrete Mechanics Design of Bridge Structures Design of Masonry Structures Design of Tall Buildings Prestressed and Composite Structures Advanced Concrete Technology Environmental impact assessment Emerging Technologies for Environmental Management Thermal Techniques for Waste Management	2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	00000 000000 000000 0	00002 220200 0000000 000
APL108 Humaniti Courses of Manager Departm CVL111 CVL121 CVP121 CVL141 CVL212 CVL222 CVL242 CVL242 CVL243 CVP242 CVL244 CVL245 CVL261 CVVL261 CVVL261 CVVL281 CVVL281 CVVL282 CVVL282	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and nent offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Lab Civil Engineering Materials Environmental Engineering Soil Mechanics Soil Mechanics Lab Structural Analysis-I Structural Analysis-I Structural Analysis Lab RC Design Structures & Material (Concrete) Lab Construction Practices Construction Management Introduction to Transportation Engineering Transportation Engineering Lab Hydraulics Hydraulics Lab Engineering Hydrology Geotechnical Engineering	3 3 3 0 3 3 0 3 0 3 0 3 0 2 2 2 3 0 3 3 0 3 3 0 3 3 0 3 3 0 3 3 0 3 3 0 3 3 0 3 3 0 3	1 : : : : : : : : : : : : : : : : : : :	2 5 1 2 2 3 2 3 3 3 3 2 2 3 3 3 4 3 4 3 4 3 4	5 110 15 4 3 3 1 3 3 4 3 3 1 5 2 2 3 3 1 4 4 1 4 4 4	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL746 CVL763 CVL765 CVL766 CVL768 CVL769 CVL770 CVL771 CVL820 CVL822 CVL823 CVL824 CVL837	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design Transportation Infrastructure Design Public Transportation Systems Analytical and Numerical Methods for Structural Engineering Concrete Mechanics Design of Bridge Structures Design of Masonry Structures Design of Tall Buildings Prestressed and Composite Structures Advanced Concrete Technology Environmental impact assessment Emerging Technologies for Environmental Management Thermal Techniques for Waste Management Life Cycle Analysis and Design for Environment	2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	00000 000000 0000000 00	0 0 0 0 0 2 2 2 0 0 0 0 0 0 0 0 0 0 0 0
APL108 Humaniti Courses i Managen Departm CVL111 CVL121 CVL121 CVL121 CVL212 CVL222 CVL222 CVL242 CVL243 CVL243 CVL243 CVL245 CVL261 CVL281 CVP281 CVP281 CVP281 CVP281 CVP281 CVP281	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and nent offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Lab Civil Engineering Materials Environmental Engineering Soil Mechanics Soil Mechanics Lab Structural Analysis-I Structural Analysis-I Structural Analysis Lab RC Design Structures & Material (Concrete) Lab Construction Practices Construction Management Introduction to Transportation Engineering Transportation Engineering Lab Hydraulics Hydraulics Lab Engineering Hydrology Geotechnical Engineering Geotechnical Engineering Lab	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 :	2 5 1 2 2 3 1 3 1 3 2 2 3 1 3 1 2 2 3 1 3 1	5 110 15 4 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 1 3 1 4 4 4 1 1 4 4 4 1 1	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL746 CVL763 CVL765 CVL766 CVL768 CVL769 CVL770 CVL771 CVL820 CVL822 CVL823 CVL824 CVL837 CVL841	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design Transportation Infrastructure Design Public Transportation Systems Analytical and Numerical Methods for Structural Engineering Concrete Mechanics Design of Bridge Structures Design of Bridge Structures Design of Tall Buildings Prestressed and Composite Structures Advanced Concrete Technology Environmental impact assessment Emerging Technologies for Environmental Management Thermal Techniques for Waste Management Life Cycle Analysis and Design for Environment Mechanics of Sediment Transport Advanced Transportation Modelling	2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 2 2	00000 000000 000000 0000	0 0 0 0 0 2 2 2 0 0 0 0 0 0 0 0 0 0 0 0
APL108 Humaniti Courses to Managem Departm CVL111 CVL121 CVL121 CVL121 CVL212 CVL222 CVL222 CVL242 CVL243 CVL243 CVL244 CVL245 CVL261 CVP261 CVP281 CVP281 CVP281 CVP281 CVP321 CVP321 CVP321	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and nent offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Lab Civil Engineering Materials Environmental Engineering Soil Mechanics Soil Mechanics Lab Structural Analysis-I Structural Analysis-I Structures & Material (Concrete) Lab Construction Practices Construction Management Introduction to Transportation Engineering Transportation Engineering Lab Hydraulics Hydraulics Lab Engineering Hydrology Geotechnical Engineering Lab Structural Analysis-II	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 :	2 5 1 2 2 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3	5 110 15 4 3 3 1 3 3 1 3 3 1 3 3 1 1 3 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 1 1 1 1 1 1 1 1	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL744 CVL763 CVL765 CVL766 CVL768 CVL769 CVL770 CVL771 CVL820 CVL822 CVL823 CVL824 CVL824 CVL841 CVL842	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design Transportation Infrastructure Design Public Transportation Systems Analytical and Numerical Methods for Structural Engineering Concrete Mechanics Design of Bridge Structures Design of Masonry Structures Design of Tall Buildings Prestressed and Composite Structures Advanced Concrete Technology Environmental impact assessment Emerging Technologies for Environmental Management Thermal Techniques for Waste Management Life Cycle Analysis and Design for Environment Mechanics of Sediment Transport Advanced Transportation Modelling Geometric Design of Roads	2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 2 2 2 2	$\begin{smallmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 $	00002 220200 0000000 00222
APL108 Humaniti Courses to Managem Departm CVL111 CVL121 CVP121 CVL141 CVL212 CVL222 CVP222 CVL242 CVP242 CVL243 CVP243 CVL244 CVL245 CVL261 CVP261 CVL282 CVL282 CVL282 CVL281 CVP281 CVP321 CVP321 CVP321 CVP321	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and ment offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Lab Civil Engineering Materials Environmental Engineering Soil Mechanics Soil Mechanics Lab Structural Analysis-I Structural Analysis-I Structural Analysis Lab RC Design Structures & Material (Concrete) Lab Construction Practices Construction Management Introduction to Transportation Engineering Transportation Engineering Lab Hydraulics Hydraulics Lab Engineering Hydrology Geotechnical Engineering Geotechnical Engineering Lab Structural Analysis-II Steel Design	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 :	2 2 3 1 2 2 3 1 3 1 2 2 3 1 2 3 1 2 2 3 1 2 2 3 1 2 3 1 2 2 3 1 3 1	5 110 15 4 4 3 3 1 3 3 4 4 3 3 1 5 2 2 2 3 3 1 4 4 4 4 1 3 3 3 3 3	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL744 CVL765 CVL766 CVL768 CVL769 CVL770 CVL771 CVL820 CVL822 CVL823 CVL824 CVL824 CVL847	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design Transportation Infrastructure Design Public Transportation Systems Analytical and Numerical Methods for Structural Engineering Concrete Mechanics Design of Bridge Structures Design of Masonry Structures Design of Tall Buildings Prestressed and Composite Structures Advanced Concrete Technology Environmental impact assessment Emerging Technologies for Environmental Management Thermal Techniques for Waste Management Life Cycle Analysis and Design for Environment Mechanics of Sediment Transport Advanced Transportation Modelling Geometric Design of Roads Transportation Economics	2333333333333333333322223	00000 000000 0000000 000000	00002 220200 0000000 002220
APL108 Humaniti Courses I Managen Departm CVL111 CVL121 CVP121 CVL241 CVL222 CVP222 CVL242 CVP242 CVL243 CVP243 CVL244 CVL245 CVL245 CVL261 CVP261 CVP261 CVP281 CVP321 CVP321 CVP342	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and nent offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Lab Civil Engineering Materials Environmental Engineering Soil Mechanics Soil Mechanics Lab Structural Analysis-I Structural Analysis-I Structural Analysis Lab RC Design Structures & Material (Concrete) Lab Construction Practices Construction Management Introduction to Transportation Engineering Transportation Engineering Lab Hydraulics Hydraulics Lab Engineering Hydrology Geotechnical Engineering Geotechnical Engineering Lab Structural Analysis-II Steel Design Structures & Material (Steel) Lab	3 3 0 3 0 3 0 3 0 3 3 0 3 3 0 3 3 0 0 3 3 0 0 3 3 0 0 3 3 0		2 2 3 1 2 2 3 1 3 1 3 2 3 3 1 2 2 3 1 4 1 4 4 1 3 3 3 1 2 2 3 1 2 2 3 2 3 1 4 1 4 4 1 3 3 3 1 2 2 3 1 4 1 4 4 1 3 3 3 1 2 2 3 3 1 2 2 3 3 1 2 2 3 3 1 2 2 3 3 1 2 2 3 3 1 2 2 3 3 1 2 2 3 3 1 2 2 3 3 1 2 3 3 1 2 2 3 3 1 2 3 3 1 2 3 3 1 2 3 3 1 2 3 3 3 1 2 3 3 3 1 2 3 3 3 1 2 3 3 3 3	5 110 15 15 15 16 17 17 17 17 17 17 17 17	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL744 CVL765 CVL766 CVL768 CVL769 CVL770 CVL771 CVL820 CVL822 CVL823 CVL824 CVL837 CVL841 CVL847 CVL857	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design Transportation Infrastructure Design Public Transportation Systems Analytical and Numerical Methods for Structural Engineering Concrete Mechanics Design of Bridge Structures Design of Bridge Structures Design of Tall Buildings Prestressed and Composite Structures Advanced Concrete Technology Environmental impact assessment Emerging Technologies for Environmental Management Thermal Techniques for Waste Management Life Cycle Analysis and Design for Environment Mechanics of Sediment Transport Advanced Transportation Modelling Geometric Design of Roads Transportation Economics Structural Safety and Reliability	2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	$\begin{smallmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 $	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
APL108 Humaniti Courses I Managen Departm CVL111 CVL121 CVL121 CVL141 CVL222 CVL222 CVL222 CVL242 CVL243 CVP243 CVL244 CVL245 CVL261 CVP261 CVL281 CVP281 CVL282 CVL381 CVP321 CVL341 CVL342 CVL341 CVL342 CVL341	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and ment offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Lab Civil Engineering Materials Environmental Engineering Soil Mechanics Soil Mechanics Lab Structural Analysis-I Structural Analysis-I Structural Analysis Lab RC Design Structures & Material (Concrete) Lab Construction Practices Construction Management Introduction to Transportation Engineering Transportation Engineering Lab Hydraulics Hydraulics Lab Engineering Hydrology Geotechnical Engineering Geotechnical Engineering Lab Structural Analysis-II Steel Design	3 3 0 3 3 0 3 0 3 0 3 3 0	0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 :	2 2 3 1 3 4 3 1 3 1 3 1 3 2 2 3 1 4 1 4 4 1 3 3 1 4 4 4 1 3 3 3 1 4 4 4 1 3 3 3 1 4 4 4 1 3 3 3 1 4 4 4 1 3 3 3 1 4 4 4 1 3 3 3 1 4 4 4 1 3 3 3 1 4 4 4 1 3 3 3 1 4 4 4 1 3 3 3 1 4 4 4 1 3 3 3 1 4 4 4 4	5 10 	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL744 CVL765 CVL766 CVL768 CVL769 CVL770 CVL771 CVL820 CVL822 CVL823 CVL824 CVL847 CVL847 CVL857 CVL858	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design Transportation Infrastructure Design Public Transportation Systems Analytical and Numerical Methods for Structural Engineering Concrete Mechanics Design of Bridge Structures Design of Masonry Structures Design of Tall Buildings Prestressed and Composite Structures Advanced Concrete Technology Environmental impact assessment Emerging Technologies for Environmental Management Thermal Techniques for Waste Management Life Cycle Analysis and Design for Environment Mechanics of Sediment Transport Advanced Transportation Modelling Geometric Design of Roads Transportation Economics Structural Safety and Reliability Theory of Plates and Shells	2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	00000 000000 0000000 0000000	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
APL108 Humaniti Courses I Managen Departm CVL111 CVL121 CVL121 CVL222 CVL222 CVL222 CVL242 CVL243 CVL243 CVL244 CVL245 CVL261 CVL281 CVL281 CVL281 CVL282 CVL281 CVL281 CVL281 CVL281 CVL281 CVL381 CVL381 CVL341 CVL341 CVL342 CVL341 CVL341 CVL341 CVL341 CVL341 CVL341 CVL341 CVL341	Mechanics of Solids Total Credits ies and Social Sciences from Humanities, Social Sciences and ment offered under this category ental Core Elements of Surveying Engineering Geology Engineering Geology Lab Civil Engineering Materials Environmental Engineering Soil Mechanics Soil Mechanics Lab Structural Analysis-I Structural Analysis-I Structural Analysis Lab RC Design Structures & Material (Concrete) Lab Construction Practices Construction Management Introduction to Transportation Engineering Transportation Engineering Lab Hydraulics Hydraulics Lab Engineering Hydrology Geotechnical Engineering Geotechnical Engineering Lab Structural Analysis-II Steel Design Structures & Material (Steel) Lab Design of Hydraulic Structures B.Tech. Project Part-I	3 3 0 3 0 3 0 3 0 3 3 0 3 3 0 3 3 0 3 0		2 2 2 3 1 3 4 3 1 3 1 3 1 3 2 2 3 1 4 1 4 4 1 3 3 3 1 4 4 4 4	5 10 	CVL486 CVL721 CVL724 CVL727 CVL728 CVL740 CVL741 CVL742 CVL743 CVL744 CVL765 CVL766 CVL768 CVL769 CVL770 CVL771 CVL820 CVL822 CVL823 CVL824 CVL847 CVL847 CVL857 CVL858	Geo-informatics Solid Waste Engineering Environmental systems analysis Environmental risk assessment Environmental Quality Modeling Pavement Materials and Design of Pavements Urban and Regional Transportation Planning Traffic Engineering Airport Planning and Design Transportation Infrastructure Design Public Transportation Systems Analytical and Numerical Methods for Structural Engineering Concrete Mechanics Design of Bridge Structures Design of Bridge Structures Design of Tall Buildings Prestressed and Composite Structures Advanced Concrete Technology Environmental impact assessment Emerging Technologies for Environmental Management Thermal Techniques for Waste Management Life Cycle Analysis and Design for Environment Mechanics of Sediment Transport Advanced Transportation Modelling Geometric Design of Roads Transportation Economics Structural Safety and Reliability	2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	$\begin{smallmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 $	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$

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6-asruoJ	NEN110	Professional Ethics and Social Responsibility-1 (Non-graded)	0 0 0.5	NLN101	Language and Writing Skills-2 (Non-graded)	0 0 2	nd the Course																	
6-62NOO	NIN100	Introduction to Engineering (Non-graded)	0 0 2 1	NEN111	Professional Ethics and Social Responsibility-2 (Non-graded)	0 0 0.5 0.25	The other half of First year students attend the Courses 1-6 of II semester first																	
T-921100	MCP101	Product Realization through Manufacturing	0 0 4 2				e other half of Firs													CVD411	B. Tech. Project-I	0 0 8 4		
g-əsinoJ	PYP100	Physics Laboratory	0 0 4 2				i .	HUL2XX		3 1 0 4	HUL2XX		3 1 0 4	SBL100	Introductory Biology for Engineers	3 0 2 4	HUL2XX		3 1 0 4	HUL3XX		3 0 0 3		
Course-5	MTL100	Calculus	3 1 0 4	CMP100	Chemistry Laboratory	0 0 4 2	alf of all first year students.	APL108	Mechanics of Solids	3 1 2 5	0	Environmental Science	2 0 0 2	CVL341	Structural Analysis-II	3 0 0 3	00 1		3 0 0 3	CVP441	Structural Design and Detailing	0 0 3 1.5		
Course-4	PYL101	Electromagnetism & Quantum Mechanics	3 1 0 4	MTL101	Linear Algebra and Differential Equations	3 1 0 4	Note: Courses 1-6 above are attended in the given order by half	APL107	Mechanics of Fluids	3 1 2 5	L281+CVP2	Hydraulics + Lab	3 1 2 5	CVL321+CVP321	Geotechnical Engineering + Lab	3 1 2 5	CVL381	Design of Hydraulic Structures	3 0 2 4				£ 00	3 1 0 4
Course-3	MCP100	Introduction to Engineering Visualization	0 0 4 2	CML101	Introduction to Chemistry	3 1 0 4	ove are attended in	CVL141	Civil Engineering Materials	3 0 0 3	L261+CVP2	Intro. to Transportation Engineering + Lab	3 0 2 4	CVL282	Engineering Hydrology	3 0 2 4	CVL342+CVP342	Steel Design + Lab	3 0 2 4	DE 3 / 0C 2		3 0 0 3	OC 2 / DE 3	3 0 0 3
Course-2	ELP101	Introduction to Electrical Engineering (Lab.)	0 0 2 1	COL100	Introduction to Computer Science	3 0 2 4	ote: Courses 1-6 ab	CVL121+CVP121	Engineering Geology + Lab	3 0 2 4	L242+CVP2	"Structural Analysis-I + Lab"	3 0 2 4	CVL245	Construction Management	2 0 0 2	CVL244	Construction Practices	2 0 0 2	DE 2		2 0 0 3	DE 5	3 0 0 3
F-92110O	ELL101	Introduction to Electrical Engineering	3 1 0 4	APL100	Engineering Mechanics	3 1 0 4	Ž	CVL111	Elements of Surveying	3 0 2 4	L222+CVP222	Soil Mechanics + Lab	3 0 2 4	CVL243+CVP243	RC Design + Lab	3 0 3 4.5	CVL212	Environmental Engineering	3 0 2 4	DE 1		2 0 2 3	DE 4	2 0 2 3
		_																						

Bachelor of Technology in **Computer Science and Engineering**Department of Computer Science and Engineering

Course C	C	re	dit	ts		Design Project	0	0	4	. 2	
Institute Core Courses							Mini Project				3
	iences (BS)		2	4			Principles of Artificial Intelligence*				4
Engineer	ring Arts and Science (EAS)		1	9			Machine Learning	3	0	2	4
	ies and Social Sciences (HuSS)		1	5			Introduction to Database Management	3	0	2	4
Program	me-linked Courses		1	4			Systems*				
-	ental Courses					COP315	Embedded System Design Project				4
•	ental Core		5			COD494*	*B.Tech. Project Part-II	0	0	1	68
•	ental Electives			1		COR310	Professional Practices (CS)				2
	tegory Courses			0			Independent Study (CS)				3
	aded Credit requirement ded Units		14 1	1			*Logic for Computer Science Introduction to Ethical Issues in Computer				4 4
nstitute	Core: Basic Sciences					COL 718	Science Architecture of High Performance Computers	3	Λ	2	. 4
	Introduction to Chemistry				4		Synthesis of Digital Systems				4
	Chemistry Laboratory		0				Real Time Systems				4
	Calculus		1				Introduction to Compressed Sensing				3
	Linear Algebra and Differential Equations		1				Advanced Computer Networks				4
	Electromagnetism & Quantum Mechanics		1				Numerical Algorithms	3	0	2	4
	Physics Laboratory	-	-		2		Rapid Mixing in Markov Chains		0		
BL100	Introductory Biology for Engineers	3	U	2	4		Compiler Design	3	0	3	4.
	Total Credits				24	COL729	Compiler Optimization	3	0	3	4
stitute	Core: Engineering Arts and Sciences					COL730	Parallel Programming	3	0	2	4
	Engineering Mechanics	3	1	Λ	4	COL731	Advanced Compiler Techniques for	3	0	2	4
	Environmental Science		0				Optimization, Safety and Security				
	Introduction to Computer Science		0				Virtualization and Cloud Computing				4
	·		1				Cloud Computing Technology Fundamentals				
	Introduction to Electrical Engineering (Lab)		0				Software Engineering				4
	Introduction to Engineering Visualization	0	0	4	2		Computational Social Choice				3
/ICP101	Product Realization through Manufacturing	0	0	4	2		Foundations of Automatic Verification				4
	Total Credits				19		Algorithmic Graph Theory				3
							Geometric Algorithms Complexity Theory		0		4
	me-Linked Basic/Engineering Arts/Science	es	Col	re			Approximation Algorithms				3
	Signals and Systems				4		Algorithmic Game Theory				3
	Optimization Methods and Applications		0				Mathematical Programming				3
	Linear Algebra and Applications		0				Model Centric Algorithm Design				4
	Algebra		0				Advanced Algorithms				4
	Probability and Stochastic Processes		1				Cryptography & Computer Security				3
	Principles of Electronic Materials				3		Advanced Data Management				4
71L103"	Physics of Nanomaterials	3	U	U	3		Data Mining	3	0	2	4
	Total Credits				14	COL762	Database Implementation	3	0	2	4
One o	of these three courses					COL764	Information Retrieval and Web Search	3	0	2	4
	of these two courses					COL765	Logic and Functional Programming		0		4
						COL768	Wireless Networks	3	0	2	4
lumaniti	ies and Social Sciences						Advanced Artificial Intelligence	3	0	2	4
Courses f	from Humanities, Social Sciences and Manag	eme	ent				Natural Language Processing				4
ffered ur	nder this category				15		Machine Learning				4
onartm	ental Core						Deep Learning				4
		_	_	_	_		Learning Probabilistic Graphical Models				4
	Data Structures and Algorithms		0				Deep Reinforcement Learning				4
	Discrete Mathematical Structures		1				Principles of Autonomous Systems				4
	Digital Logic and System Design		0				Computer Vision				4
	Computer Architecture Programming Languages		0				Computer Graphics Digital Image Analysis				4
	Design Practices		0				• •				4
	Operating Systems		0				Virtual and Augmented Reality Advanced Functional Brain Imaging				4
	Principles of Artificial Intelligence*		0				Online Algorithms and Competitive Analysis				
	Computer Networks		0				Advanced Topics in Embedded Computing				3
	Analysis and Design of Algorithms		1				Advanced Computer Vision				4
	Introduction to Automata and Theory		0				Special Topics in Parallel Computation				3
OL002	of Computation	Ü	Ü	٠	Ü		Special Topics in Hardware Systems				3
OL362	Introduction to Database Management	3	0	2	4		Special Topics in Flandware Systems Special Topics in Software Systems				3
	Systems*	J	J	_	•		Special Topics in Theoretical Computer Science				3
	•	2	0	2	3		Special Topics in Artificial Intelligence				3
	Introduction to Parallel and Distributed			_	_	JUL004		J	U	U	ు
	Introduction to Parallel and Distributed Programming	_	·			COL 865		3			
COL380	Programming			1:	26		Special Topics in Computer Applications		0	0	3
COL380 COD490		0	0		26 26	COL866		3	0	0	

COL869	Special Topics in Concurrency	3	0	0	3	COV888	Special Module in Database Systems 1 0 0 1
COL870	Special Topics in Machine Learning	3	0	0	3	COV889	Special Module in Concurrency 1 0 0 1
COL871	Special Topics in Programming Languages	3	0	0	3	SIL765	Networks & System Security 3 0 2 4
COL872	Special Topics in Cryptography	3	0	0	3	SIL769	Internet Traffic -Measurement, 3 0 2 4
COL873	Special Topics in Natural Language Processing	3	0	0	3		Modeling & Analysis
COL874	Special Topics in Compilers and Language	3	0	0	3	SIL801	Special Topics in Multimedia System 3 0 0 3
	Implementation					SIL802	Special Topics in Web Based Computing 3 0 0 3
COL876	Special Topics in Formal Methods	3	0	0	3	SIV813	Applications of Computer in Medicines 1 0 0 1
COL886	Special Topics in Operating Systems	3	0	0	3	SIV861	Information and Comm Technologies 1 0 0 1
COV877	Special Module on Visual Computing	1	0	0	1		for Development
COV878	Special Module in Machine Learning	1	0	0	1	SIV864	Special Module on Media Processing & 1 0 0 1
COV879	Special Module in Financial Algorithms	2	0	0	2		Communication
COV880	Special Module in Parallel Computation	1	0	0	1	SIV895	Special Module on Intelligent Information 1 0 0 1
COV881	Special Module in Hardware Systems	1	0	0	1		Processing
COV882	Special Module in Software Systems	1	0	0	1		· ·
	Special Module in Theoretical Computer Science	1	0	0	1	* One o	f COL333 or COL362 will be considered as DC and other will
	Special Module in Artificial Intelligence	1	0	0	1	be co	nsidered as DE
	Special Module in Computer Applications	1	0	0	1	** DC fo	r CS1 students with specialization, DE for other CS1 students
	Special Module in Algorithms	1	0	0	1		th at most 4 credits counted towards DE.
	Special Module in High Speed Networks	1	0	0	-	*** DC fo	r CS1 students with specialization.
	- P	-	-	_			

Total = 150.0

B.Tech. in Computer Science and Engineering

	Contact Hours			0.1			4.0				25.0	Π		28.0			27.0			26.0			18.0			15.0
_	don-graded Unit			14 19.0 2.25 31.0			1.25 24.0				0			0			2 2			0			0 1			0
_	Stiberd			9.0 2			18.0				21.0			22.0			22.0			22.0			2.0			14.0
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_				6			12	er fir			15	h		14			15			17			9	П		12
	Course-10	NLN100	Language and Writing Skills-1 (Non-graded)	0 0 2				1-6 of II semest																		
	6-9sinoJ	NEN110	Professional Ethics and Social Responsibility-1 (Non-graded)	0 0 0.5 0.25	NLN101	Language and Writing Skills-2 (Non-graded)	0 0 2 1	The other half of First year students attend the Courses 1-6 of II semester first																		
	8-aeruoJ	NIN100	Introduction to Engineering (Non-graded)	0 0 2 1	NEN111	Professional Ethics and Social Responsibility-2 (Non-graded)	0 0 0.5 0.25	First year students																		
	₹-əsiuoƏ	MCP101	Product Realization through Manufacturing	0 0 4 2				ł																		
	g-əsinoƏ	PYP100	Physics Laboratory	0 0 4 2				If of all first year students.				COP290	Design Practices	0 0 6 3	XXEQOO	Design Project (Non-graded)	0 0 4 2	COL380	Intro. to Parallel & Distributed Programming	2 0 2 3						
	Course-5	MTL100	Calculus	3 1 0 4	CMP100	Chemistry Laboratory	0 0 4 2	er by half of all fir	MTL106	Probability and Stochastic Processes	3 1 0 4	HUL2XX		3 1 0 4	HUL2XX		3 1 0 4	HUL2XX		3 1 0 4						
	4-9s1100	PYL101	Electromagnetism & Quantum Mechanics	3 1 0 4	MTL101	Linear Algebra and Differential Equations	3 1 0 4	d in the given ord	PYL102	Principles of Electronic Materials	3 0 0 3	CVL100	Environmental Science	2 0 0 2	SBL100	Introductory Biology for Engineers	3 0 2 4	MTLXXX	Programme-Linked Course in Mathematics	3 0 0 3				HUL3XX		3 0 0 3
	6-92inoJ	MCP100	Introduction to Engineering Visualization	0 0 4 2	_	Introduction to Chemistry	3 1 0 4	above are attende	COL106	Data Structures & Algorithms	3 0 4 5	ELL205	Signals and Systems	3 1 0 4	C0L351	Analysis and Design of Algorithms	3 1 0 4	C0L352	Intro. to Automata & Theory of Computation	3 0 0 3	COD490 / 492	B.Tech. Project Part-I	0 0 12 6	DE 3 (4)		3 0 2 4
	S-asiuoJ	ELP101	Introduction to Electrical Engineering (Lab.)	0 0 2 1	انا	Introduction to Computer Science	3 0 2 4	Note: Courses 1-6 above are attended in the given order by hal	C0L215	Digital Logic & System Design	3 0 4 5	C0L216	Computer Architecture	3 0 2 4	C0L334	Computer Networks	3 0 2 4	C0L331	Operating Systems	3 0 4 5	00 1 (3)		8 0 0 8	00 3 (3)		3 0 0 3
	F-921100	ELL101	Introduction to Electrical Engineering	3 1 0 4	APL100	Engineering Mechanics	3 1 0 4		C0L202	Discrete Mathematical Structures	3 1 0 4	C0L226	Programming Languages	3 0 4 5	COL333 / DE 1	Principles of Artificial Intelligence	3 0 2 4	COL362 / DE1	Introduction to Database Management Systems	3 0 2 4	DE 2 (3)		3 0 0 3	0C 2 (4)		3 1 0 4
	Semester		_			=				=			≥			>			5			=			Ĭ	

Dual Degree Programme: Bachelor of Technology and Master of Technology in Computer Science and Engineering Department of Computer Science and Engineering

The overall Credit Structure				_ D	Departmental Electives											
Course Category	Cı	redi	its			Design Project		0								
Institute Core Courses		_				Mini Project		0								
Basic Sciences (BS)		24				Principles of Artificial Intelligence*		0								
Engineering Arts and Science (EAS)		19				Machine Learning		0								
Humanities and Social Sciences (HuSS)		15		С	OL362	Introduction to Database Management	3	0	2	4						
Programme-linked Courses		14				Systems*										
Departmental Courses Departmental Core		49				Embedded System Design Project		1								
Departmental Electives		11				Professional Practices (CS)		0								
Open Category Courses		10				Independent Study (CS)		3								
Total B.Tech. Credit Requirement	1	142		C	OL/07	Introduction to Ethical Issues in Computer	3	0	2	4						
Non Graded Units		11		_	01 740	Science	_	_	_							
M. Tech. Part						Architecture of High Performance Computers										
Programme Core Courses		32				Synthesis of Digital Systems Real Time Systems		0								
Programme Elective Courses		14				Introduction to Compressed Sensing		0								
Total M.Tech. Credit Requirement		46				Advanced Computer Networks		0								
Grand Total Credit Requirement	1	188				Rapid Mixing in Markov Chains		0								
Institute Core: Basic Sciences						Compiler Design				4.5						
CML101 Introduction to Chemistry	3	1 () 4			Compiler Optimization				4.5						
CMP100 Chemistry Laboratory			1 2	_		Parallel Programming	-	0	-							
MTL100 Calculus) 4			Advanced Compiler Techniques for		0								
MTL101 Linear Algebra and Differential Equations		1 0				Optimization, Safety and Security										
PYL101 Electromagnetism & Quantum Mechanics		1 0			OL732	Virtualization and Cloud Computing	3	0	2	4						
PYP100 Physics Laboratory			1 2			Cloud Computing Technology Fundamentals	3	0	2	4						
SBL100 Introductory Biology for Engineers	3	0 2	2 4			Software Engineering		0								
Total Credits			2			Computational Social Choice		0								
Institute Care, Engineering Arts and Sciences				С	OL750	Foundations of Automatic Verification	3	0	2	4						
Institute Core: Engineering Arts and Sciences					OL751	Algorithmic Graph Theory	3	0	0	3						
APL100 Engineering Mechanics		1 0		_	OL752	Geometric Algorithms	3	0	2	4						
COL100 Introduction to Computer Science		0 2				Complexity Theory		0								
CVL100 Environmental Science		0 C		C		Approximation Algorithms		0								
ELL101 Introduction to Electrical Engineering ELP101 Introduction to Electrical Engineering (Lab)			2 1	C		Algorithmic Game Theory		0								
MCP100 Introduction to Engineering Visualization			1 2	·		Mathematical Programming		0								
MCP101 Product Realization through Manufacturing			1 2	·		Model Centric Algorithm Design		0								
Total Credits		•	1	, ,		Advanced Algorithms		0								
						Cryptography & Computer Security		0								
Programme-Linked Basic/Engineering Arts/Science	ces C	ore				Advanced Data Management Data Mining		0								
ELL205 Signals and Systems) 4	_		Database Implementation		0								
MTL103* Optimization Methods and Applications		0 0				Information Retrieval and Web Search		0								
MTL104* Linear Algebra and Applications		0 0				Logic and Functional Programming		0								
MTL105* Algebra		0 0		_		Wireless Networks		0								
MTL106 Probability and Stochastic Processes PYL102# Principles of Electronic Materials		0 0) 4	_	OL770	Advanced Artificial Intelligence		0								
PYL103# Physics of Nanomaterials		0 0		_		Natural Language Processing		0								
Total Credits	0	0 0				Machine Learning		0								
rotal Credits			,.		OL775	Deep Learning		0								
*One of these three courses				С	OL776	Learning Probabilistic Graphical Models			2							
# one of these two courses				С	OL777	Deep Reinforcement Learning	3	0	2	4						
Humanities and Social Sciences						Principles of Autonomous Systems	3	0	2	4						
		- 4				Computer Vision		0								
Courses from Humanities, Social Sciences and Manag	jemer	Ί	1	_		Computer Graphics				4.5						
offered under this category			,	C		Digital Image Analysis				4.5						
Departmental Core						Virtual and Augmented Reality		0								
COL106 Data Structures and Algorithms	3	0 4	1 5			Advanced Functional Brain Imaging		0								
COL202 Discrete Mathematical Structures		1 0		C		Advanced Topics in Embedded Computing		0								
COL215 Digital Logic and System Design	3	0 4	1 5			Online Algorithms and Competitive Analysis	3									
COL216 Computer Architecture	3	0 2	2 4			Advanced Computer Vision		0								
COL226 Programming Languages			1 5	_		Advanced Computer Graphics		0								
COP290 Design Practices		0 6		_		Special Topics in Operating Systems		0								
COL331 Operating Systems		0 4		_		Special Topics in Compiler Design		0								
COL333 Principles of Artificial Intelligence*		0 2		_		Special Topics in Hardware Systems		0								
COL334 Computer Networks		0 2		_		Special Topics in Software Systems		0								
COL351 Analysis and Design of Algorithms) 4			Special Topics in Software Systems Special Topics in Theoretical Computer Science		0								
COL352 Introduction to Automata and	3	0 0	J			Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence		0								
Theory of Computation	2	0 0	2 3			Special Topics in Artificial Intelligence Special Topics in Computer Applications		0								
COL380 Introduction to Parallel and Distributed Programming	2	0 2	_ 3			Special Topics in Computer Applications Special Topics in Algorithms		0								
Total Credits			4	_		Special Topics in Algorithms Special Topics in High Speed Networks		0								
rotar Greatts			4	9 C	, J L U U I	opedial Topics in Flight opeed Networks	J	U	U	J						

COL868											
	Special Topics in Database Systems	3	0	0	3	COL764	Information Retrieval and Web Search	3	0	2	4
COL869	Special Topics in Concurrency	3	0	0	3	COL768	Wireless Networks	3	0	2	4
	Special Topics in Machine Learning			0	3		Advanced Artificial Intelligence			2	
							· ·				
	Special Topics in Programming Languages			0			Natural Language Processing			2	
COL872	Special Topics in Cryptography	3	0	0	3		Machine Learning	3	0	2	4
COL873	Special Topics in Natural Language Processing	3	0	0	3	COL775	Deep Learning	3	0	2	4
COL874	Special Topics in Compilers and Language	3	0	0	3		Learning Probabilistic Graphical Models	3	0	2	4
	Implementation	-	_	-	-					2	
001.070	•	^	^	^	_		Deep Reinforcement Learning				
	Special Topics in Formal Methods			0	3		Principles of Autonomous Systems			2	
COV877	Special Module on Visual Computing	1	0	0	1	COL785	Virtual and Augmented Reality	3	0	2	4
COV878	Special Module in Machine Learning	1	0	0	1		Computer Vision	3	Λ	2	4
	Special Module in Financial Algorithms	2	Λ	0	2		Computer Graphics				4.5
	•			0			·				
	Special Module in Parallel Computation						Digital Image Analysis				4.5
COV881	Special Module in Hardware Systems	1	0	0	1	COL787	Online Algorithms and Competitive Analysis	3	0	0	3
COV882	Special Module in Software Systems	1	0	0	1	COL788	Advanced Topics in Embedded Computing	3	0	0	3
COV883	Special Module in Theoretical Computer Science	1	0	0	1		Independent Study			0	
	Special Module in Artificial Intelligence			0							
	•						System Level Design and Modelling			0	
	Special Module in Computer Applications			0		COL818	Principles of Multiprocessor Systems	3	0	2	4
COV886	Special Module in Algorithms	1	0	0	1	COL819	Advanced Distributed Systems	3	0	2	4
COV887	Special Module in High Speed Networks	1	0	0	1		Reconfigurable Computing			0	
	Special Module in Database Systems	1	Λ	0	1						
				0			Advanced Computer Vision			2	
	Special Module in Concurrency					COL830	Distributed Computing	3	0	0	3
SIL765	Networks & System Security			2		COL831	Semantics of Programming Languages	3	0	0	3
SIL769	Internet Traffic -Measurement, Modeling & Analysis	3	0	2	4		Proofs and Types	3	Λ	0	3
SIL801	Special Topics in Multimedia System	3	0	0	3					2	
SIL802	Special Topics in Web Based Computing			0			Advanced Computer Graphics				
						COL860	Special Topics in Parallel Computation			0	
SIV813	Applications of Computer in Medicines			0		COL861	Special Topics in Hardware Systems	3	0	0	3
SIV861	Information and Comm Technologies for	1	0	0	1	COI 862	Special Topics in Software Systems			0	
	Development									0	
SIV864	Special Module on Media Processing &	1	0	0	1	COLOGS	Special Topics in Theoretical	3	U	U	3
017001	Communication	•	Ŭ	·	•		Computer Science				
011/005			^	^		COL864	Special Topics in Artificial Intelligence	3	0	0	3
SIV895	Special Module on Intelligent Information	1	U	0	1	COL865	Special Topics in Computer Applications	3	0	0	3
	Processing						Special Topics in Algorithms			0	
B	0										
Program	Core						Special Topics in High Speed Networks			0	
COI 703	Logic for Computer Science	3	Λ	2	4	COL868	Special Topics in Database Systems	3	0	0	3
	•					COL869	Special Topics in Concurrency	3	0	0	3
COL/20	Numerical Algorithms			2			Special Topics in Machine Learning	3	Λ	0	3
					3	OCLOIG			0	0	U
	Minor Project	0	0	О	•	COL 071	•		$^{\circ}$	^	2
COD891	•			0 14			Special Topics in Programming Languages	3		0	
COD891 COD892	M.Tech. Project Part–I	0	0	14	17		•	3		0	
COD891 COD892	M.Tech. Project Part–I M.Tech. Project Part–II	0	0	14		COL872	Special Topics in Programming Languages Special Topics in Cryptography	3 3	0		3
COD891 COD892	M.Tech. Project Part–I	0	0	14	17	COL872 COL873	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing	3 3 3	0	0 0	3 3
COD891 COD892 COD893	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits	0	0	14	17 314	COL872 COL873	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language	3 3 3	0	0	3 3
COD891 COD892 COD893	M.Tech. Project Part–I M.Tech. Project Part–II	0	0	14	17 314	COL872 COL873 COL874	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation	3 3 3 3	0 0 0	0 0 0	3 3 3
COD891 COD892 COD893	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives	0	0	14 28	17 314 32	COL872 COL873 COL874	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods	3 3 3 3	0 0 0	0 0 0	3 3 3
COD891 COD892 COD893 Program COD745	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project	0 0	0 0	14 28 6	314 32	COL872 COL873 COL874	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation	3 3 3 3	0 0 0	0 0 0	3 3 3
COD891 COD892 COD893 Program COD745	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives	0 0	0 0	14 28	314 32	COL872 COL873 COL874 COL876 COL886	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems	3 3 3 3 3	0 0 0	0 0 0	3 3 3 3
COD891 COD892 COD893 Program COD745	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project	0 0	0 0	14 28 6	314 32	COL872 COL873 COL874 COL876 COL886 COV877	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing	3 3 3 3 1	0 0 0 0 0	0 0 0 0	3 3 3 3 1
COD891 COD892 COD893 Program COD745 COL707	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science	0 0 0 3	0 0	14 28 6 2	314 32 3 3 4	COL872 COL873 COL874 COL876 COL886 COV877 COV878	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning	3 3 3 3 1 1	0 0 0 0 0	0 0 0 0 0	3 3 3 3 1 1
COD891 COD892 COD893 Program COD745 COL707	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science Architecture of High Performance Computers	0 0 3 3	0 0 0 0	1 ² 28 6 2 2	314 32 3 4	COL872 COL873 COL874 COL876 COL886 COV877 COV878 COV879	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning Special Module in Financial Algorithms	3 3 3 3 1 1 2	0 0 0 0 0 0	0 0 0 0 0 0	3 3 3 3 1 1 2
COD891 COD892 COD893 Program COD745 COL707 COL718 COL719	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science Architecture of High Performance Computers Synthesis of Digital Systems	0 0 3 3 3	0 0 0 0	14 28 6 2 2	314 32 3 4 4	COL872 COL873 COL874 COL876 COL886 COV877 COV878 COV879	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning	3 3 3 3 1 1 2	0 0 0 0 0 0	0 0 0 0 0	3 3 3 3 1 1 2
COD891 COD892 COD893 Program COD745 COL707 COL718 COL719 COL720	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science Architecture of High Performance Computers Synthesis of Digital Systems Real Time Systems	0 0 3 3 3 3	0 0 0 0 0 0	6 2 2 2 2 2	3 3 3 3 4 4 4 4	COL872 COL873 COL874 COL876 COL886 COV877 COV878 COV879 COV880	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning Special Module in Financial Algorithms Special Module in Parallel Computation	3 3 3 3 1 1 2 1	0 0 0 0 0 0 0	0 0 0 0 0 0 0	3 3 3 3 1 1 2
COD891 COD892 COD893 Program COD745 COL707 COL718 COL719 COL720 COL724	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science Architecture of High Performance Computers Synthesis of Digital Systems Real Time Systems Advanced Computer Networks	0 0 3 3 3 3 3	0 0 0 0 0 0	6 2 2 2 2 2 2	3 3 3 4 4 4 4 4 4	COL872 COL873 COL874 COL876 COL886 COV877 COV878 COV879 COV880 COV881	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Hardware Systems	3 3 3 3 1 1 2 1	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	3 3 3 3 1 1 2 1
COD891 COD892 COD893 Program COD745 COL707 COL718 COL719 COL720 COL724	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science Architecture of High Performance Computers Synthesis of Digital Systems Real Time Systems	0 0 3 3 3 3 3 3	0 0 0 0 0 0 0 0	1 ² 28 6 2 2 2 2 2 0	3 3 3 3 4 4 4 4 4 4 3	COL872 COL873 COL874 COL876 COL886 COV877 COV878 COV879 COV880 COV881 COV882	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Hardware Systems Special Module in Software Systems	3 3 3 3 1 1 2 1 1	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	3 3 3 3 1 1 2 1 1
COD891 COD892 COD893 Program COD745 COL707 COL718 COL719 COL720 COL724 COL727	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science Architecture of High Performance Computers Synthesis of Digital Systems Real Time Systems Advanced Computer Networks Rapid Mixing in Markov Chains	0 0 3 3 3 3 3 3	0 0 0 0 0 0 0 0	1 ² 28 6 2 2 2 2 2 0	3 3 3 4 4 4 4 4 4	COL872 COL873 COL874 COL876 COL886 COV877 COV878 COV879 COV880 COV881 COV882	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Hardware Systems Special Module in Software Systems Special Module in Theoretical	3 3 3 3 1 1 2 1 1	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	3 3 3 3 1 1 2 1 1
COD891 COD892 COD893 Program COD745 COL707 COL718 COL719 COL720 COL724 COL727 COL728	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science Architecture of High Performance Computers Synthesis of Digital Systems Real Time Systems Advanced Computer Networks Rapid Mixing in Markov Chains Compiler Design	0 0 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0	6 2 2 2 2 2 3	3 3 4 4 4 4 4 4 4 3 4.5	COL872 COL873 COL874 COL876 COL886 COV877 COV878 COV879 COV880 COV881 COV882	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Hardware Systems Special Module in Software Systems	3 3 3 3 1 1 2 1 1 1	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	3 3 3 3 1 1 2 1 1 1
COD891 COD892 COD893 Program COD745 COL707 COL718 COL720 COL724 COL727 COL728 COL729	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science Architecture of High Performance Computers Synthesis of Digital Systems Real Time Systems Advanced Computer Networks Rapid Mixing in Markov Chains Compiler Design Compiler Optimization	0 0 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0 0	6 2 2 2 2 2 3 3	3 3 4 4 4 4 4 4 4 4 5 4.5	COL872 COL873 COL874 COL876 COL886 COV877 COV878 COV879 COV880 COV881 COV882 COV883	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Hardware Systems Special Module in Software Systems Special Module in Theoretical	3 3 3 3 1 1 2 1 1 1	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	3 3 3 3 1 1 2 1 1 1
COD891 COD892 COD893 Program COD745 COL707 COL718 COL720 COL724 COL727 COL728 COL729 COL730	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science Architecture of High Performance Computers Synthesis of Digital Systems Real Time Systems Advanced Computer Networks Rapid Mixing in Markov Chains Compiler Design Compiler Optimization Parallel Programming	0 0 3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0 0	6 2 2 2 2 2 2 3 3 2	3 4 4 4 4 4 4 4 4 5 4 5 4 5 4	COL872 COL873 COL874 COL876 COL886 COV877 COV878 COV879 COV881 COV882 COV883	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Hardware Systems Special Module in Software Systems Special Module in Theoretical Computer Science Special Module in Artificial Intelligence	3 3 3 3 1 1 2 1 1 1	0 0 0 0 0 0 0 0 0 0		3 3 3 3 1 1 2 1 1 1
COD891 COD892 COD893 Program COD745 COL707 COL718 COL720 COL724 COL727 COL728 COL729 COL730	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science Architecture of High Performance Computers Synthesis of Digital Systems Real Time Systems Advanced Computer Networks Rapid Mixing in Markov Chains Compiler Design Compiler Optimization Parallel Programming Advanced Compiler Techniques for	0 0 3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0 0	6 2 2 2 2 2 3 3	3 4 4 4 4 4 4 4 4 5 4 5 4 5 4	COL872 COL873 COL874 COL876 COL886 COV877 COV878 COV880 COV881 COV882 COV883 COV884 COV884	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Hardware Systems Special Module in Software Systems Special Module in Theoretical Computer Science Special Module in Artificial Intelligence Special Module in Computer Applications	3 3 3 3 1 1 2 1 1 1 1			3 3 3 3 1 1 2 1 1 1 1
COD891 COD892 COD893 Program COD745 COL707 COL718 COL720 COL724 COL727 COL728 COL729 COL730	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science Architecture of High Performance Computers Synthesis of Digital Systems Real Time Systems Advanced Computer Networks Rapid Mixing in Markov Chains Compiler Design Compiler Optimization Parallel Programming	0 0 3 3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0 0 0	6 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 3 3 4 4 4 4 4 4 4 5 4.5 4.5 4	COL872 COL873 COL874 COL876 COL886 COV877 COV878 COV880 COV881 COV882 COV883 COV884 COV885 COV886	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Hardware Systems Special Module in Software Systems Special Module in Theoretical Computer Science Special Module in Artificial Intelligence Special Module in Computer Applications Special Module in Algorithms	3 3 3 3 1 1 2 1 1 1 1 1	0 0 0 0 0 0 0 0 0 0 0 0	000000000000000000000000000000000000000	3 3 3 3 1 1 2 1 1 1 1 1
COD891 COD892 COD893 Program COD745 COL707 COL718 COL720 COL724 COL727 COL728 COL729 COL730 COL731	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science Architecture of High Performance Computers Synthesis of Digital Systems Real Time Systems Advanced Computer Networks Rapid Mixing in Markov Chains Compiler Design Compiler Optimization Parallel Programming Advanced Compiler Techniques for	0 0 3 3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0 0 0	6 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 3 3 4 4 4 4 4 4 4 5 4.5 4.5 4	COL872 COL873 COL874 COL876 COL886 COV877 COV878 COV880 COV881 COV882 COV884 COV885 COV886 COV886	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Hardware Systems Special Module in Software Systems Special Module in Theoretical Computer Science Special Module in Artificial Intelligence Special Module in Computer Applications Special Module in Algorithms Special Module in High Speed Networks	3 3 3 3 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1	000000000000000000000000000000000000000	000 0000000 0000	3 3 3 3 1 1 2 1 1 1 1 1 1 1
COD891 COD892 COD893 Program COD745 COL707 COL718 COL720 COL724 COL727 COL728 COL729 COL730 COL731	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science Architecture of High Performance Computers Synthesis of Digital Systems Real Time Systems Advanced Computer Networks Rapid Mixing in Markov Chains Compiler Design Compiler Optimization Parallel Programming Advanced Compiler Techniques for Optimization, Safety and Security Virtualization and Cloud Computing	0 0 3 3 3 3 3 3 3 3 3 3 3		6 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	COL872 COL873 COL874 COL876 COL886 COV877 COV878 COV880 COV881 COV882 COV884 COV885 COV886 COV886	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Hardware Systems Special Module in Software Systems Special Module in Theoretical Computer Science Special Module in Artificial Intelligence Special Module in Computer Applications Special Module in Algorithms	3 3 3 3 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1	000000000000000000000000000000000000000	000000000000000000000000000000000000000	3 3 3 3 1 1 2 1 1 1 1 1 1 1
COD891 COD893 COD893 Program COD745 COL707 COL718 COL729 COL724 COL727 COL728 COL729 COL730 COL731 COL732 COL732 COL732 COL7340	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science Architecture of High Performance Computers Synthesis of Digital Systems Real Time Systems Advanced Computer Networks Rapid Mixing in Markov Chains Compiler Design Compiler Optimization Parallel Programming Advanced Compiler Techniques for Optimization, Safety and Security Virtualization and Cloud Computing Software Engineering	0 0 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0 0 0 0 0	6 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	COL872 COL873 COL874 COL876 COL886 COV877 COV878 COV881 COV882 COV884 COV885 COV886 COV887 COV887	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Hardware Systems Special Module in Software Systems Special Module in Theoretical Computer Science Special Module in Artificial Intelligence Special Module in Computer Applications Special Module in Algorithms Special Module in High Speed Networks Special Module in Database Systems	3 3 3 3 1 1 2 1 1 1 1 1 1 1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	000 0000000 00000	3 3 3 3 3 1 1 1 2 1 1 1 1 1 1 1
COD891 COD893 COD893 Program COD745 COL707 COL718 COL720 COL724 COL729 COL728 COL729 COL730 COL731 COL732 COL734 COL744 COL749	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science Architecture of High Performance Computers Synthesis of Digital Systems Real Time Systems Advanced Computer Networks Rapid Mixing in Markov Chains Compiler Design Compiler Optimization Parallel Programming Advanced Compiler Techniques for Optimization, Safety and Security Virtualization and Cloud Computing Software Engineering Computational Social Choice	0 0 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6 2 2 2 2 2 0 3 3 2 2 2 2 0 0	3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	COL872 COL876 COL876 COL886 COV877 COV878 COV889 COV881 COV883 COV884 COV885 COV886 COV887 COV888	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Hardware Systems Special Module in Software Systems Special Module in Theoretical Computer Science Special Module in Artificial Intelligence Special Module in Computer Applications Special Module in Algorithms Special Module in High Speed Networks Special Module in Database Systems Special Module in Database Systems Special Module in Concurrency	3 3 3 3 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	000 0000000 000000	3 3 3 3 3 1 1 1 2 1 1 1 1 1 1 1 1
COD891 COD893 COD893 Program COD745 COL718 COL719 COL720 COL724 COL727 COL728 COL729 COL730 COL731 COL732 COL740 COL749 COL750	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science Architecture of High Performance Computers Synthesis of Digital Systems Real Time Systems Advanced Computer Networks Rapid Mixing in Markov Chains Compiler Design Compiler Optimization Parallel Programming Advanced Compiler Techniques for Optimization, Safety and Security Virtualization and Cloud Computing Software Engineering Computations of Automatic Verification	0 0 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6 2 2 2 2 2 0 3 3 2 2 2 2 2 0 2	3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	COL872 COL873 COL874 COL876 COL886 COV877 COV878 COV880 COV881 COV882 COV884 COV885 COV886 COV887 COV888 COV888 COV888 SIL765	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Hardware Systems Special Module in Software Systems Special Module in Theoretical Computer Science Special Module in Artificial Intelligence Special Module in Computer Applications Special Module in Algorithms Special Module in High Speed Networks Special Module in Database Systems Special Module in Concurrency Networks & System Security	3 3 3 3 1 1 2 1 1 1 1 1 1 1 3 3 3 3 3 3	000000000000000000000000000000000000000	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	3 3 3 3 3 1 1 1 2 1 1 1 1 1 1 1 1 1 1 1
COD891 COD893 COD893 Program COD745 COL718 COL719 COL720 COL724 COL727 COL728 COL729 COL730 COL731 COL732 COL740 COL749 COL750	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science Architecture of High Performance Computers Synthesis of Digital Systems Real Time Systems Advanced Computer Networks Rapid Mixing in Markov Chains Compiler Design Compiler Optimization Parallel Programming Advanced Compiler Techniques for Optimization, Safety and Security Virtualization and Cloud Computing Software Engineering Computational Social Choice	0 0 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6 2 2 2 2 2 0 3 3 2 2 2 2 0 0	3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	COL872 COL876 COL876 COL886 COV877 COV878 COV889 COV881 COV883 COV884 COV885 COV886 COV887 COV888	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Hardware Systems Special Module in Hardware Systems Special Module in Theoretical Computer Science Special Module in Artificial Intelligence Special Module in Computer Applications Special Module in Algorithms Special Module in High Speed Networks Special Module in Database Systems Special Module in Concurrency Networks & System Security Internet Traffic -Measurement,	3 3 3 3 1 1 2 1 1 1 1 1 1 1 3 3 3 3 3 3	000000000000000000000000000000000000000	000 0000000 000000	3 3 3 3 3 1 1 1 2 1 1 1 1 1 1 1 1 1 1 1
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COD891 COD893 COD893 Program COD745 COL718 COL719 COL720 COL724 COL727 COL728 COL729 COL731 COL731 COL731 COL732 COL740 COL749 COL750 COL751 COL752	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science Architecture of High Performance Computers Synthesis of Digital Systems Real Time Systems Advanced Computer Networks Rapid Mixing in Markov Chains Compiler Design Compiler Optimization Parallel Programming Advanced Compiler Techniques for Optimization, Safety and Security Virtualization and Cloud Computing Software Engineering Computational Social Choice Foundations of Automatic Verification Algorithmic Graph Theory Geometric Algorithms	0 0 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3		6 2 2 2 2 2 0 3 3 2 2 2 2 0 2 0 2 0 2	3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	COL872 COL873 COL874 COL876 COL886 COV877 COV878 COV880 COV881 COV882 COV884 COV885 COV886 COV887 COV888 COV888 COV888 SIL765	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Hardware Systems Special Module in Hardware Systems Special Module in Theoretical Computer Science Special Module in Artificial Intelligence Special Module in Computer Applications Special Module in Algorithms Special Module in High Speed Networks Special Module in Database Systems Special Module in Concurrency Networks & System Security Internet Traffic -Measurement,	3 3 3 3 3 1 1 2 1 1 1 1 1 1 1 1 3 3		00000000000000022	3 3 3 3 1 1 1 2 1 1 1 1 1 1 1 1 1 1 4 4 4
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COD891 COD893 COD893 Program COD745 COL707 COL718 COL720 COL724 COL727 COL728 COL729 COL730 COL731 COL732 COL740 COL749 COL755 COL755 COL755 COL756	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science Architecture of High Performance Computers Synthesis of Digital Systems Real Time Systems Advanced Computer Networks Rapid Mixing in Markov Chains Compiler Design Compiler Optimization Parallel Programming Advanced Compiler Techniques for Optimization, Safety and Security Virtualization and Cloud Computing Software Engineering Computational Social Choice Foundations of Automatic Verification Algorithmic Graph Theory Geometric Algorithms Complexity Theory Approximation Algorithms Algorithmic Game Theory	0 0 0 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	00 000000000000000000000000000000000000	6 2 2 2 2 2 2 2 2 2 0 2 0 0 0 0 0	3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	COL872 COL876 COL876 COL886 COV877 COV878 COV880 COV881 COV882 COV883 COV884 COV885 COV886 COV887 COV888 SIL769 SIL801 SIL802 SIV813	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Software Systems Special Module in Software Systems Special Module in Artificial Intelligence Special Module in Artificial Intelligence Special Module in Computer Applications Special Module in High Speed Networks Special Module in Database Systems Special Module in Concurrency Networks & System Security Internet Traffic -Measurement, Modeling & Analysis Special Topics in Multimedia System Special Topics in Web Based Computing Applications of Computer in Medicines	3 3 3 3 3 1 1 2 1 1 1 1 1 1 1 1 3 3 3 3	000 0000000 0000000 000	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	3 3 3 3 1 1 1 2 1 1 1 1 1 1 1 1 1 1 4 4 4 3 3 3 1 1
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COD891 COD893 COD893 COD893 COD745 COL707 COL718 COL719 COL720 COL727 COL728 COL729 COL730 COL731 COL732 COL740 COL749 COL750 COL751 COL755 COL755 COL755 COL755 COL755 COL755 COL755 COL755	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science Architecture of High Performance Computers Synthesis of Digital Systems Real Time Systems Advanced Computer Networks Rapid Mixing in Markov Chains Compiler Design Compiler Optimization Parallel Programming Advanced Compiler Techniques for Optimization, Safety and Security Virtualization and Cloud Computing Software Engineering Computational Social Choice Foundations of Automatic Verification Algorithmic Graph Theory Geometric Algorithms Complexity Theory Approximation Algorithms Algorithmic Game Theory Mathematical Programming Model Centric Algorithm Design Advanced Algorithms Cryptography & Computer Security	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	00 00000000 000000000000000000000000000	62 2222203322 2202020000220	314 32 34 44 44 44 43 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5	COL872 COL873 COL876 COL886 COV877 COV878 COV880 COV881 COV882 COV883 COV885 COV886 COV886 COV886 COV887 COV888 SIL765 SIL769 SIL801 SIL802 SIV813 SIV861	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Parallel Computation Special Module in Software Systems Special Module in Theoretical Computer Science Special Module in Artificial Intelligence Special Module in Algorithms Special Module in Algorithms Special Module in High Speed Networks Special Module in Database Systems Special Module in Concurrency Networks & System Security Internet Traffic -Measurement, Modeling & Analysis Special Topics in Multimedia System Special Topics in Web Based Computing Applications of Computer in Medicines Information and Comm Technologies for Development Special Module on Media Processing & Communication	3 3 3 3 3 3 1 1 2 1 1 1 1 1 1 1 1 3 3 3 3		000 00000000 00000022 0000 0	3 3 3 3 1 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1
COD891 COD893 COD893 COD893 COD745 COL707 COL718 COL719 COL720 COL727 COL728 COL729 COL730 COL731 COL749 COL749 COL750 COL751 COL755 COL755 COL755 COL756 COL757 COL758 COL757 COL758 COL759 COL759 COL759 COL759 COL759	M.Tech. Project Part–I M.Tech. Project Part–II Total Credits Electives Minor Project Introduction to Ethical Issues in Computer Science Architecture of High Performance Computers Synthesis of Digital Systems Real Time Systems Advanced Computer Networks Rapid Mixing in Markov Chains Compiler Design Compiler Optimization Parallel Programming Advanced Compiler Techniques for Optimization, Safety and Security Virtualization and Cloud Computing Software Engineering Computational Social Choice Foundations of Automatic Verification Algorithmic Graph Theory Geometric Algorithms Complexity Theory Approximation Algorithms Algorithmic Game Theory Mathematical Programming Model Centric Algorithm Design Advanced Algorithms Cryptography & Computer Security Advanced Data Management	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	00 00000000 000000000000000000000000000	62 222203322 22020200002202	314 32 34 44 44 44 43 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5	COL872 COL873 COL876 COL886 COV877 COV878 COV880 COV881 COV882 COV883 COV885 COV885 COV886 COV887 COV888 COV887 COV888 COV887 COV888 COV887 COV888 COV887 COV888 COV889 SIL765 SIL769 SIL801 SIL801 SIV861 SIV864	Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Special Module on Visual Computing Special Module in Machine Learning Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Fardware Systems Special Module in Software Systems Special Module in Theoretical Computer Science Special Module in Artificial Intelligence Special Module in Computer Applications Special Module in High Speed Networks Special Module in Database Systems Special Module in Database Systems Special Module in Concurrency Networks & System Security Internet Traffic -Measurement, Modeling & Analysis Special Topics in Multimedia System Special Topics in Web Based Computing Applications of Computer in Medicines Information and Comm Technologies for Development Special Module in Computational Neuroscience	3 3 3 3 3 1 1 2 1 1 1 1 1 1 1 3 3 3 3 3	000 00000000 000000 0000 0 0	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	3 3 3 3 3 3 1 1 1 2 1 1 1 1 1 1 1 1 1 1
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Dual Degree Programme: B.Tech. and M.Tech. in Computer Science and Engineering

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Contact Hours			31.0			24.0				25.0			28.0			23.0			26.0			19.0			23.0			23.0			28.0
Non-graded Unit			2.25			1.25				0			0			0			0			0			0			0			0
Credits			19.0			18.0				21.0			22.0			20.0			22.0			17.0			19.0			16.0			28 14.0
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			1			Ť	ster f			_			14						17			-			12			6			0
Course-10	NLN100	Language and Writing Skills-1 (Non-graded)	0 0 2				1-6 of II semester first																								
6-esinoJ	NEN110	Professional Ethics and Social Responsibility-1 (Non-graded)	0 0 0.5 0.25	NLN101	Language and Writing Skills-2 (Non-oraded)	0 0 2 1	attend the Courses																								
8-asruoJ	NIN100	Introduction to Engineering (Non-graded)	0 0 2 1	NEN111	Professional Ethics and Social Responsibility-2 (Non-graded)	0 0 0.5 0.25	The other half of First year students attend the Courses																								
7-9s1uoJ	MCP101	Product Realization through Manufacturing	0 0 4 2				The other half of																								
g-asınoე	PYP100	Physics Laboratory	0 0 4 2				all first year students.				C0P290	Design Practices	0 0 6 3				COL380	Intro. to Parallel & Distributed Programming	2 0 2 3	PE 1 (3)			00 (2)		3 0 0 3						
G-9s1uoJ	MTL100	Calculus	3 1 0 4	CMP100	Chemistry Laboratory	0 0 4 2	of o	MTL106	Probability and Stochastic Processes	3 1 0 4	HUL2XX		3 1 0 4	HUL2XX		3 1 0 4	HUL2XX		3 1 0 4				PE 3 (3)		3 0 0 3						
6ourse-4	PYL101	Electromagnetism & Quantum Mechanics	3 1 0 4	MTL101	Linear Algebra and Differential Equations	3 1 0 4	ed in the given orc	PYLXXX	Programme-linked Courses in Physics	3 0 0 3	CVL100	Environmental Science	2 0 0 2	SBL100	Introductory Biology for Engineers	3 0 2 4	MTLXXX	Programme-linked Course in Mathematics	8 0 0 8	0C 1 (3)		3 0 0 3	PE 2 (3)		3 0 0 3	00 (3)		3 0 0 3			
Course-3	MCP100	Introduction to Engineering Visualization	0 0 4 2	CML101	Introduction to Chemistry	3 1 0 4	above are attende	COL106	Data Structures & Algorithms	3 0 4 5	ELL205	Signals and Systems	3 1 0 4	COL351	Analysis and Design of Algorithms	3 1 0 4	COL352	Intro. to Automata & Theory of Computation	3 0 0 3	COL703	Logic for Computer Science	3 0 2 4	HUL3XX		3 0 0 3	C0D892	M. Tech. Project Part-I	0 0 14 7	C0D893	M.Tech. Project Part-II	0 0 28 14
S-esruoJ	ELP101	Introduction to Electrical Engineering (Lab.)	0 0 2 1	COL100	Introduction to Computer Science	3 0 2 4	Note: Courses 1-6 above are attended in the given order by half	C0L215	Digital Logic & System Design	3 0 4 5	C0L216	omputer A	3 0 2 4	C0L334	Computer Networks	3 0 2 4	COL331	Operating Systems	3 0 4 5	DE 3(4)		3 0 2 4	COL726	merical /	3 0 2 4	PE 5 (3)		3 0 0 3			
F-921100	ELL101	Introduction to Electrical Engineering	3 1 0 4	APL100	Engineering Mechanics	3 1 0 4		C0L202	Discrete Mathematical Structures	3 1 0 4	C0L226	<u>≅</u>	3 0 4 5	COL333 / DE 1	Principles of Artificial Intelligence	3 0 2 4	COL362 / DE1	Introduction to Database Management Systems	3 0 2 4	DE 2 (3)		3 0 0 3	C0D891	r Project	0 0 6 3	PE 4 (3)		3 0 0 3			
Semester		_	1	М		1	1		=			≥			>	۲		N	_		₹	\dashv	_		\dashv		<u>×</u>			×	

Bachelor of Design (B.Des.)Department of Design

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	rall Credit Structure			-I:4			Design Management and IPR Design Project-5 Dissertation			2 2 189
	Category Core Courses	(Cre	ait	S	DDD310	(Dissertation Project/Thesis, Continued)	U	U	103
	ring Arts and Science (EAS)		0	2		DDD620	Design Project-6	0	0	26 13
Graded	• , ,		14	9			(Industry/Research Project)			
•	ime-linked Courses		1	5						
-	ental Courses		10	2		Departm	ental Electives			
•	nental Core nental Electives		12	.s 5		DDL725	Information Design & Data Visualization	2	0	2 3
•	ategory Courses			9		DDL768	Design Research Methodology	2	0	2 3
	aded Credit requirement		15	8			Advanced Typography			2 3
Non Gra	ded Units		0	9			Animation Design			2 3
Institute	Core: Engineering Arts and Sciences						Storybook Design Publication Design			2 3 2 3
	Environmental Science	2	Λ	Λ	2		Product Design and Development			2 3
CVLIOU		_	U	U			Design for Usability			2 3
	Total Credits				02		Design for User Experience			0 3
Non Gra	ded Units					DDR862	Design in Indian Context	3	0	0 3
NEN110	Professional Ethics and Social	0	0	0.5	0.25		Design Entrepreneurship			2 2
	Responsibility-1						Design for Product Lifecycle			2 3
NLN100	Language and Writing Skills-1	0	0	2	1	DDL/24	Qualitative and Quantitative	2	0	2 3
NEN111	Professional Ethics and Social	0	0	0.5	0.25	DDD912	Methods in Design Media Studies	2	Λ	2 3
	Responsibility-2						Transportation Design			2 3
	Language and Writing Skills-2		0				Medical Device Design			4 4
	Social Immersion		0				Inclusive Innovation			2 4
	Industry Internship		0		2		Human Values and Technology			0 3
D3R422	Design Degree Show	U	0	4	2		Exhibition Design			2 1
Departm	ental Core						Health Care Design			2 3
DDL110	Understanding Design and Design Movements	2	0	2	3		Design of Assistive Technologies			2 3
	Visualization Techniques		0				AI/ML/DS Driven Design			2 3 2 3
DDL112	Design Process	1	0	2	2		Special Topics in Design Universal Design			2 3
DDP113	Computer Aided Visualization	0.5	0	3	2		Professional Practice in Design			4 3
	Materials & Processes for Model Making		0				Professional Workshops in Design			2 2
	Design Thinking & Design Critique		0			DDL745	Invited Design Seminars	1	0	0 1
	Fundamentals of Design		0				Design for Industry 4.0	2	0	2 3
	Product Visualization Techniques Exploratory Design Methods		0				Design of Sustainable Habitats			2 3
	Applied Ergonomics		0				Self-initiated Design Project			6 3
	Design with Contemporary Technologies		0			DDR852	Strategic Design Management	2	U	2 3
	Elements of Design		0			Onen Ele	actives			
DDD120	Design Project-1	0	0	6	3	Open Ele			_	
	Typography and Layout		0			DDR852	Strategic Design Management			0 0
	Materials and Prototyping		0				Culture and Cognition			0 0
	Advanced Visualization Techniques		0				Visual Methods in Social Research			0 0
	CAD and Digital Prototyping		0				Meaning in Natural Language Media, Culture and Society			0 0
	Engineering for Designers Design for Future		0				Emotion and Cognition			0 0
	Art and Craft Practicum		0				Philosophy and Film			0 0
	Photography, Illustration and Moving Images						Art and Technology			0 0
DDL321			0				Narrative Matters	1	0	0 1
DDL222	Design Research Methods	1	0	2	2	HUL334	From Text to Film	3	3	0 0
	Cognitive Ergonomics	2	0	2	3		Art and Aesthetics			0 0
	Design Project-2 (Simple Product Design)		0				Ethnographic Research Methods			0 1
	Storytelling and Film Making		0				Themes in Modern Indian Thought			0 0
	Market Research and Trend Analysis		0			HSL202	Social Psychological Approaches to Health	3	1	0 4
	System Oriented Design		0			HSI 384	& Wellbeing Codex to Hypertext	3	3	0 0
DDL311	Branding-Identity and Packaging Design Design for Developing Nations		0				Critical Thinking			0 4
	Creativity & Sustainability in Nature		0				Cognitive Psychology			0 0
	Design Project-3		0				Judgment and Decision Making			0 0
•	(Collaborative Design Project)	-	-	-			-			
DDL314	Designing for Society & Culture	1	0	4	3	Note:				
	Design for UI/UX	1	0	4	3	1. Depar	tment of Design is in discussion with th	ne c	on	cerned
	Exhibition and Space Design		0			depart	ments for their approval for open elective cou	ırses		
DDD410	Design Project-4	0	0	12	26		can be the first list of electives, more could	rses	wc	ould be
	(Dissertation Project/Thesis)					added	to the list.			

Total = 158.0

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Contact Hours			30.5			33.0			27.0			31.0				37.0			31.0				32.0			30.0
stinU babarg-noM			1.25			1.25			0			0				0			0				0			0
Credits			17.0			18.0			17.0			21.0				22.0			21.0				20.0			13.0
۵			24			27			20			20 21.0				30			20 2				24 20.0			30 13.0
-			2			0			0	_		0				0			0				0			0
			ف			9			_			Ξ				7			Ξ				8			0
6-asruoJ	NLN100	Language and Writing Skills-1 (Non-graded)	0 0 2 1	NLN101	Language and Writing Skills-2 (Non-graded)	0 0 2 1																				
8-asiuoJ	NEN110	Professional Ethics and Social Responsibility-1 (Non-graded)	0 0 0.5 0.25	NEN111	Professional Ethics and Social Responsibility-2 (Non-graded)	0 0 0.5 0.25				CLV100	Environmental Science	2 0 2 0	4)							.4)						
7-9s1noJ	DDL116	Fundamentals of Design	1 0 4 3	DDL126	Typography and Layout	1 0 4 3	DDL217	Photography, Illustration and Moving Images	2 0 2 3	DDL226	System Oriented Design	1 0 2 2	ion (DDR227) Social Immersion (Non-graded) 0-0-4-2 (Contact Hrs.		Programme Elective-1	2 0 2 3				ed) 0-0-4-2 (Contact Hrs.						
g-əsino)	DDL115	Design Thinking & Design Critique	1 0 2 2	DDD 120	Design Project-1	0 0 6 3	DDP216	Art and Craft Practicum	0 0 2 1	DDL225	Market research and Trend Analysis	1 0 2 2	I Immersion (Non-grade	DDL315	Design for UI/UX	1 0 4 3		Open Elective-2	3 0 0 3	ry Internship (Non-grade						
G-esruoO	DDP114	Materials & Processes for Model Making	0 0 4 2	DDL125	Elements of design	1 0 4 3	DDL215	Design for Future	1 0 2 2	DDL224	Storytelling and Film making	2 0 2 3	cation (DDR227) Socia	DDL314	Designing for Society & Culture	1 0 4 3		Open Elective-1	3 0 0 3	Summer Vacation (DDR324) Industry Internship (Non-graded) 0-0-4-2 (Contact Hrs.		Programme Elective-5	2 0 2 3			
6-esiuoJ	DDP113	Computer Aided Visualization	0.5 0 3 2	-	Design with Contemporary Technologies	1 0 2 2	DDL214	Engineering for Designers	1 0 2 2	DDD320	Design Project-2 (Simple Product Design)	0 0 8 4	Summer Vacati	DDD310	Design Project-3 (Collaborative Design Project)	0 0 8 4		Programme Elective-2	2 0 2 3	Summer Vac		Programme Elective-4	2 0 2 3			
Course-3	DDL112	Design Process	1 0 2 2	DDL123	Applied Ergonomics	1 0 2 2	DDL213	CAD and Digital Prototyping	1 0 4 3	DDL223	Cognitive Ergonomics	2 0 2 3		DDL313	Creativity & Sustainability in Nature	1 0 4 3		Programme Elective-2	2 0 2 3			Open Elective-3	3 0 0 3			
Course-2	DDL111	Visualization Techniques	1 0 4 3	DDL122	Exploratory Design Methods	1 0 2 2	DDL212	Advanced Visualization Techniques	1 0 4 3	DDL222	Design Research Methods	1 0 2 2		DDL312	Design for Developing Nations	1 0 4 3	DDD410	Design Project 4 Dissertation Project / Thesis	0 0 12 6		000510	Design Project 5 Dissertation Project / Thesis (Continued)	0 0 18 9	DDR422	Design Degree Show (Non-Graded Unit)	0 0 4 2
f-esruoJ	DDL110	Understanding Design & Design Movements	2 0 2 3	DDL121	Product Visualization Techniques	1 0 4 3	DDL 211	Materials and Prototyping	1 0 4 3	DDL 321	Model Making	2 0 2 3		DDL 311	Branding-Identity and Packaging Design	1 0 4 3	DDL 228	Exhibition and Space Design	1 0 4 3		DDL 411	Design Management and IPR	1 0 2 2	DSD 620	Design Project 6 (Industry / Research Project)	0 0 26 13
Semester					=			=			2				>			>				M			II	

Bachelor of Design

Bachelor of Technology in **Electrical Engineering**Department of Electrical Engineering

The overall Credit Structure Course Category Institute Core Courses Basic Sciences (BS) Engineering Arts and Science (EAS) Humanities and Social Sciences (HuSS) Programme-linked Courses Departmental Courses Departmental Core Departmental Electives	24 19 15 15	ELL225	Electromagnetics Laboratory Control Engineering-I Control Engineering Laboratory Power Electronics Power Electronics Laboratory Power Engineering-I	3 0 3 0 3 0 3	1 0 1 0 1 0 1 0 1 0 1 0 1 0 1	3 1.5 0 3 3 1.5
Open Category Courses	10	ELL305	•		0 (
Total Graded Credit requirement Non Graded Units	153 11	ELP305	j ,			3 1.5
	•••	ELL311 ELP311	Communication Engineering Communication Engineering Laboratory			0 4 2 1
Institute Core: Basic Sciences		ELD411	B.Tech. Project-I			6 3
CML101 Introduction to Chemistry	3 1 0 4	225 111	Total Credits	Ŭ		60
CMP100 Chemistry Laboratory MTL100 Calculus	0 0 4 2 3 1 0 4					
MTL100 Calculus MTL101 Linear Algebra and Differential Equations	3 1 0 4	Departm	ental Electives			
PYL101 Electromagnetism & Quantum Mechanics	3 1 0 4	ELL301	Electrical and Electronics Instrumentation	3	0	0 3
PYP100 Physics Laboratory	0 0 4 2	ELL312				0 3
SBL100 Introductory Biology for Engineers	3 0 2 4	ELL312	1 67			0 3
Total Credits	24	ELL315	1 0			0 3
Institute Core: Engineering Arts and Sciences		ELL316	Introduction to VLSI Design	3	0	0 3
APL100 Engineering Mechanics	3 1 0 4	ELL318	Digital Hardware Design	3	0	0 3
COL100 Introduction to Computer Science	3 0 2 4	ELL319	Digital Signal Processing			2 4
CVL100 Environmental Science	2 0 0 2	ELL332				0 3
ELL101 Introduction to Electrical Engineering	3 1 0 4	ELL333	Multivariable Control			0 3
ELP101 Introduction to Electrical Engineering (Lab)	0 0 2 1	ELL365	Embedded Systems			0 3
MCP100 Introduction to Engineering Visualization	0 0 4 2	ELL400	Power Systems Protection			0 3
MCP101 Introduction to Product Realization	0 0 4 2	ELL401	Advanced Electromechanics			0 3
through Manufacturing		ELL402	•	3		0 3 0 3
Total Credits	19	ELL405 ELL406	Operating Systems Robotics and Automation			03
Humanities and Social Sciences		ELL407	Power Quality			2 4
	gamant	ELL409	Machine Intelligence and Learning			2 4
Courses from Humanities, Social Sciences and Mana offered under this category	gement 15	ELL410	Multicore Systems			0 3
onered under this category	10	ELL411	Digital Communications			2 4
Programme-Linked Basic/Engineering Arts/Scien	ices Core	ELL703	Optimal Control Theory	3	0	0 3
COL106 Data Structures and Algorithms	3 0 4 5	ELL710	Coding Theory	3	0	0 3
MTL106 Probability and Stochastic Processes	3 1 0 4	ELL715	Digital Image Processing	3	0	2 4
MCL142 Thermal Science for Electrical Engineers	3 0 0 3	ELL716	Telecommunication Switching and Transmission	3	0	0 3
PYL102 Principles of Electronic Materials	3 0 0 3		Multichannel Signal Processing			0 3
Total Credits	15		Wireless Communications			0 3
Devication and all Comp			I.C. Technology			0 3
Departmental Core		ELL738				0 3
ELL201 Digital Electronics	3 0 3 4.5	ELL740	Compact Modeling of Semiconductor Devices On water Device Characterization Laboratory			2 4
ELL202 Circuit Theory	3 1 0 4	ELP740	,			6 3 0 3
ELL203 Electromechanics	3 1 0 4	ELL758 ELL765	Power Quality Smart Grid Technology			0 3
ELP203 Electromechanics Laboratory ELL205 Signals and Systems	0 0 3 1.5 3 1 0 4	ELS310	Independent Study (EL)			0 3
ELLEGO Oliginale and Oyeleme	3 1 0 4	LL0010	macpondon olday (LL)	U	5 '	5 5

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Contact Hours			31.0			24.0				26.0			26.0			25.0			27.0			21.0			12.0
Non-graded Units			19.0 2.25 31.0			1.25				0			0			0			0			0			0
Credits			19.0			18.0 1.25				24.0			22.0			20.5			22.0			15.5			12.0
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Ot-seruoJ	NLN100	Language and Writing Skills-1 (Non-graded)	0 0 2				1-6 of II seme																		
6-92110J	NEN110	Professional Ethics and Social Responsibility-1 (Non-graded)	0 0 0.5 0.25	NLN101	Language and Writing Skills-2 (Non-graded)	0 0 2 1	The other half of First year students attend the Courses 1-6 of II semester first.																		
8-921UOJ	NIN100	Introduction to Engineering (Non-graded)	0 0 2 1	NEN111	Professional Ethics and Social Responsibility-2 (Non-graded)	0 0 0.5 0.25	First year students										ELP302	Power Electronics Laboratory	0 0 3 1.5						
Course-7	MCP101	Product Realization through Manufacturing	0 0 4 2				The other half of							ELP225	Control Engineering Lab	0	ELP305	Design and System Laboratory	0 0 3 1.5						
g-əsinoJ	PYP100	Physics Laboratory	0 0 4 2				st year students.	HUL 2XX		3 1 0 4	ELP203	Electromechanics Laboratory	0 0 3 1.5	ELP212	Electromagnetics Laboratory	0 0 3 1.5	ELP311	Communication Engineering Laboratory	0 0 2 1	ELP303	Power Engineering Laboratory	0 0 3 1.5			
Course-5	MTL100	Calculus	3 1 0 4	CMP100	Chemistry Laboratory	0 0 4 2	er by half of all fir	ELL205	Signals and Systems	3 1 0 4	ELL225	Control Engineering-I	3 1 0 4	ELL305	Computer Architecture		DE 1		3 0 2 4	ELD411	B.Tech. Project	0 0 6 3			
Course-4	PYL101	Electromagnetism & Quantum Mechanics	3 1 0 4	MTL101	Linear Algebra and Differential Equations	3 1 0 4	d in the given ord	ELL211	Physical Electronics	3 0 0 3	MTL106	Probability and Stochastic Processes	3 1 0 4	ELL302	Power Electronics	3 0 0 3	ELL303	Power Engineering-I	3 1 0 4	001		3 0 2 4	HUL3XX		3 0 0 3
Course-3	MCP100	Introduction to Engineering Visualization	0 0 4 2	L101	Introduction to Chemistry	3 1 0 4	above are attende	ELL203	Electromechanics	3 1 0 4	SBL100	Introductory Biology for Engineers	3 0 2 4	CVL100	Environmental Science	2 0 0 2	PYL102	Principles of Electronic Materials	3 0 0 3	DE 2		3 0 0 3	003		3 0 0 3
S-981100	ELP101		0 0 2 1		Introduction to Computer Science	3 0 2 4	Note: Courses 1-6 above are attended in the given order by half of all first year students.	COL106	Data Structures & Algorithms	3 0 4 5	ELL212	Engineering Electromagnetics	3 1 0 4	ELL311	Communication Engineering	3 1 0 4	HUL2XX		3 1 0 4	HUL2XX		3 1 0 4	002		3 0 0 3
F-921100	ELL101	Introduction to Electrical Engineering (Lab.)	3 1 0 4	APL100	Engineering Mechanics	3 1 0 4		ELL202	Circuit Theory	3 1 0 4	ELL201	Digital Electronics	3 0 3 4.5	ELL304	Analog Electronic Circuits	3 1 3 5.5	MCL142	Thermal Science for Electrical Engineers	3 0 0 3				DE 3		3 0 0 3
Semester	Г				=	-			=			2		Г	>			5			₹			=	

Bachelor of Technology in Electrical Engineering Power and Automation Department of Electrical Engineering

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The overall Credit Structure		ELL203	Electromechanics	3	1	0	4
Course Category	Credits	ELP203	Electromechanics Laboratory	0	0	3	1.5
Institute Core Courses		ELL205		3	1	0	4
Basic Sciences (BS)	24	ELL225	Control Engineering-I	3	1	0	4
Engineering Arts and Science (EAS)	19	ELP225	Control Engineering Laboratory	0	0	3	1.5
Humanities and Social Sciences (HuSS)	15	ELL231	Power Electronics and Energy Devices	3	0	0	3
Programme-linked Courses	15	ELL302	Power Electronics	3	0	0	3
Departmental Courses		ELP302	Power Electronics Laboratory	0	0	3	1.5
Departmental Core	60	ELL303	Power Engineering-I	3	1	0	4
Departmental Electives	10	ELP303	Power Engineering Laboratory	0	0	3	1.5
Open Category Courses	10	ELL304	Analog Electronic Circuits	3	1	3	5.5
Total Graded Credit requirement	152	ELL305	Computer Architecture	3	0	0	3
Non Graded Units	11	ELP305	Design and System Laboratory	0	0	3	1.5
Institute Core : Basic Sciences		ELL332	Electric Drives	3	0	0	3
CML101 Introduction to Chemistry	3 1 0 4	ELP332	Electric Drives Laboratory	0	0	3	1.5
CMP100 Chemistry Laboratory	0 0 4 2	ELL363	Power Engineering-II	3	0	0	3
MTL100 Calculus	3 1 0 4	ELL365	Embedded Systems	3	0	0	3
MTL101 Linear Algebra and Differential Equations	3 1 0 4	ELD431	B.Tech. Project-I	0	0	6	3
PYL101 Electromagnetism & Quantum Mechanics	3 1 0 4		Total Credits				60
PYP100 Physics Laboratory	0 0 4 2		Total Ground				•
SBL100 Introductory Biology for Engineers	3 0 2 4						
Total Credits	24		ental Electives				
		ELL301			0		
Institute Core: Engineering Arts and Sciences		ELL311	Communication Engineering		1		
APL100 Engineering Mechanics	3 1 0 4	ELL319	Digital Signal Processing		0		
COL100 Introduction to Computer Science	3 0 2 4	ELL333	Multivariable Control		0		
CVL100 Environmental Science	2 0 0 2	ELL334	DSP Based Control of Drives		0		
ELL101 Introduction to Electrical Engineering	3 1 0 4	ELL400	Power Systems Protection		0		
ELP101 Introduction to Electrical Engineering (Lab)	0 0 2 1	ELL401	Advanced Electromechanics		0		
MCP100 Introduction to Engineering Visualization	0 0 4 2	ELL405	Operating Systems		0		
MCP101 Product Realization through Manufacturing	0 0 4 2	ELL406	Robotics and Automation	3	0		
Total Credits	19	ELL407	Power Quality		-	2	-
		ELL409	Machine Intelligence and Learning		0		
Humanities and Social Sciences		ELL410	Multicore Systems		0		
Courses from Humanities, Social Sciences and Manag	jement	ELL417	Renewable Energy System	3	0	0	3
offered under this category	15	ELL431	Power System Optimization	3	0	0	3
		ELL436	Digital Control	3	0	0	3
Programme-Linked Basic/Engineering Arts/Science	ces Core	ELL437	Switch Mode Power Conversion		0		
COL106 Data Structures and Algorithms	3 0 4 5	ELL453	Power System Dynamics and Control		0		
MTL106 Probability and Stochastic Processes	3 1 0 4	ELL703	Optimal Control Theory	3	0	0	3
MCL142 Thermal Science for Electrical Engineers	3 0 0 3	ELL715	Digital Image Processing	3	0	2	4
PYL102 Principles of Electronic Materials	3 0 0 3	ELL 724	Multichannel Signal Processing		0		
Total Credits	15	ELL730	I.C. Technology	3	0	0	3
		ELP740	On-wafer Device Characterization Laboratory		0		
Departmental Core		ELL758			0		
ELL201 Digital Electronics	3 0 3 4.5	ELL765	Smart Grid Technology		0		
ELL202 Circuit Theory	3 1 0 4	ELS330	Independent Study (EP)	0	3	0	3
•			. , ,				

Total = 153.0

B.Tech. in Electrical Engineering Power and Automation

Contact Hours			31.0			24.0				24.0			26.0			25.0			22.0			24.0			15.0
Non-graded Units						1.25				0			0			0			0			0			0
Credits			19.0 2.25			18.0				21.0			23.0			21.0			19.0			17.0			15.0
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			1			12	ster fi			15	Н		17			=			15			<u>ი</u>			15
Ot-serioo	NLN100	Language and Writing Skills-1 (Non-graded)	0 0 2				1-6 of II seme																		
6-9synoO	NEN110	Professional Ethics and Social Responsibility-1 (Non-graded)	0 0 0.5 0.25	NLN101	Language and Writing Skills-2 (Non-graded)	0 0 2 1	The other half of First year students attend the Courses 1-6 of II semester first.																		
8-azruoJ	NIN100	Introduction to Engineering (Non-graded)	0 0 2 1	NEN111	Professional Ethics and Social Responsibility-2 (Non-graded)	0 0 0.5 0.25	First year students																		
Course-7	MCP101	Product Realization through Manufacturing	0 0 4 2				The other half of				HUL2XX		3 1 0 4				ELP302	Power Electronics Laboratory	0 0 3 1.5	ELP332	Electric Drives Laboratory	0 0 3 1.5			
g-asinoJ	PYP100	Physics Laboratory	0 0 4 2				If of all first year students.				ELP203	Electromechanics Laboratory	0 0 3 1.5	ELP225	Control Engineering-I	0 0 3 1.5	ELP305	Design and System Laboratory	0 0 3 1.5	ELP303	Power Engineering Laboratory	0 0 3 1.5			
G-esruoJ	MTL100	Calculus	3 1 0 4	CMP100	Chemistry Laboratory	0 0 4 2	er by half of all fin	ELL205	Signals and Systems	3 1 0 4	ELL225	Control Engineering-I	3 1 0 4	ELL305	Computer Architecture	3 0 0 3	ELL332	Electric Drives	3 0 0 3	ELD431	B.Tech. Project-I	0 0 6 3	HUL3XX		3 0 0 3
6-esiuoJ	PYL101	Electromagnetism & Quantum Mechanics	3 1 0 4	MTL101	Linear Algebra and Differential Equations	3 1 0 4	d in the given ord	SBL100	Introductory Biology for Engineers	3 0 2 4	MTL106	Probability and Stochastic Processes	3 1 0 4	HUL2XX		3 1 0 4	ELL303	Power Engineering-I	3 1 0 4	0C1		3 0 2 4	003		3 0 0 3
Course-3	MCP100	Introduction to Engineering Visualization	0 0 4 2	CML101	Introduction to Chemistry	3 1 0 4	above are attende	ELL203	Electromechanics	3 1 0 4	CVL100	Environmental Science	2 0 0 2	ELL302	Power Electronics	3 0 0 3	PYL102	Principles of Electronic Materials	3 0 0 3	ELL363	Power Engineering-II	3 0 0 3	002		3 0 0 3
Course-2	ELP101	Introduction to Electrical Engineering (Lab.)	0 0 2 1	COL100	Introduction to Computer Science	3 0 2 4	Note: Courses 1-6 above are attended in the given order by ha	COL106	Data Structures & Algorithms	3 0 4 5	ELL231	Power Electronics and Energy Devices	3 0 0 3	DE 1		3 0 2 4	ELL365	Embedded Systems	3 0 0 3	HUL2XX		3 1 0 4	DE 3		3 0 0 3
F-987110J	ELL101	Introduction to Electrical Engineering	3 1 0 4	APL100	Engineering Mechanics	3 1 0 4		ELL202	Circuit Theory	3 1 0 4	ELL201	Digital Electronics	3 0 3 4.5	ELL304	Analog Electronic Circuits	3 1 3 5.5	MCL142	Thermal Science for Electrical Engineers	3 0 0 3				DE 2		3 0 0 3
Semester		-			=				=			≥			>			5			₹			=	

Bachelor of Technology in **Energy Engineering**Department of Energy Science and Engineering

The over	rall Credit Structure					ESL372	Intelligent Techniques for Energy System Analysis	3	0	0	3
Course C	Category	(Cre	dit	s		Energy Economics				3
Institute	Core Courses						B.Tech Project-I				3
Basic Sc	iences (BS)			4		ESL400	Energy Efficiency	3	0	0	3
	ring Arts and Science (EAS)		1				Total Credits				67
	ies and Social Sciences (HuSS)		1								
•	me-linked Courses		1	2		Departm	ental Electives				
-	ental Courses		_	_		FSI 300	Self-organizing Dynamical Systems	3	0	0	3
•	ental Core		6				Building Integrated Photovoltaics				3
	ental Electives		1 1				Energy, Ecology and Environment				4
•	tegory Courses aded Credit requirement		15				Hydrodynamic Machines	3	1	0	4
	ded Units		1			ESL342	Nanotechnology in Energy Conversion and Storage	3	0	0	3
Institute	Core : Basic Sciences					ESL351	Fundamentals of Internal Combustion Engines	3	0	0	3
CML101	Introduction to Chemistry	3	1	0	4	ESL360	Direct Energy Conversion Methods	3	1	0	4
	Chemistry Laboratory	0	0	4	2	ESL374	Smart Devices for Energy Harvesting	3	0	0	3
	Calculus	3	1	0	4		IoT for Energy Systems				3
MTL101	Linear Algebra and Differential Equations	3	1	0	4		Smart Buildings				3
PYL101	Electromagnetism & Quantum Mechanics	3	1	0	4		Optimization of Energy System				3
PYP100	Physics Laboratory	0	0	4	2	ESL380					4
SBL100	Introductory Biology for Engineers	3	0	2	4		Plasma Science	-	-	-	4
	Total Credits				24		Plasma Sources and Diagnostics				3
							Waste to Energy				3
Program	me-Linked Basic/Engineering Arts/Science	es	Co	re		ESL420	Industry Relevant Photovoltaic Technologies				3
MCL140	Engineering Thermodynamics	3	1	0	4		Hybrid Vehicles				3
MCL242	Heat Transfer	3	1	0	4		Plasma Chemistry	-	-	-	-
MLL100	Introduction to Materials Science and Engg.	3	0	2	4		Plasma Based Technologies for Smart Materials Wind and Tidal Wave Energy				3
	Total Credits				12		Pulse Width Modulation Techniques and AC		0		
						LOLIZI	Motor Drives	J	U	U	J
	Core: Engineering Arts and Sciences					FSI 732	Bioconversion and Processing of Waste	3	0	0	3
	Engineering Mechanics		1				Power System Planning and Operation				3
	Introduction to Computer Science		0				Bioenergy: Resources, Technologies and		0		
	Environmental Science		0				Applications				
	Introduction to Electrical Engineering		1			ESL742	Economics and Financing of Renewable	3	0	0	3
	Introduction to Electrical Engineering (Lab)		0				Energy Systems				
	Introduction to Engineering Visualization		0			ESL746	Hydrogen Energy	3	0	0	3
MCPIUI	Product Realization through Manufacturing	U	0	4		ESL749	Developing Energy Efficiency and Renewable	2	0	2	3
	Total Credits				19		Energy Projects				
Humaniti	ies and Social Sciences						Economics and Planning of Energy Systems				
							Solar Thermal Technologies and Applications				
	from Humanities, Social Sciences and Manage	eme	ent		4-		Solar Photovoltaic Devices and Systems				3
offered ur	nder this category				15		Energy Policy and Planning				3
Departm	ental Core					ESL/62	Computational Fluid Dynamics for Energy	3	0	2	4
	Mechanics of Solids and Fluids	3	1	Λ	1	ECI 700	Systems	2	^	^	2
ESL100			1 1			ESL768	Wind and Small Hydro Energy Systems				3
ESL260			1			ESL769	Design of Wind Turbines				3
	Semiconductors for Energy Systems		0			ESL//4	Quantitative Methods and Planning for Energy	3	U	U	3
ESL261	Analog and Digital Electronics		0			ECI 775	Systems Liquid Spraya for Energy Sector and Industrial	2	Λ	Λ	2
ESL200			1			ESLITS	Liquid Sprays for Energy Sector and Industrial Applications	3	U	U	3
	Electrical Machines		0			ESL776	Industrial Energy and Environment Analysis	3	٥	٥	3
ESL280	Introduction to Plasma Concepts		0				Alternative Fuels for Aircraft and Rocket				3
ESL263			0			LOLIOI	Propulsion	Ū	Ŭ	Ŭ	·
ESL370	Control Systems and Automation		0			ESL784	Cogeneration and Energy Efficiency	3	0	0	3
ESL341	Energy Storage		0			ESL791					
ESL371	Design of Energy Systems		1			ESL796					3
ESL361	Power Systems and Smart Grid Operations		0				Systems				
ESL373	Computational Methods for Energy Systems		0			ESL798		3	0	0	3
ESL352			0			ESL845					3
ESP260					1.5	ESL855	Solar Photovoltaic Power Generation	3	0	0	3
ESP300		0	0	3	1.5	ESD406	B.Tech. Project-II	0	0	18	8 9
	-										

Contact Hours

31.0

24.0

17.0/ 18.0/ 20.0

21.0

Total = 157.0

24.0/ 25.0

25.0

2.25 18.0 1.25 Non-graded Units 0 0 0 0 0 0 19.0 24.0 17.0 18.0 0 19.0 0 Credits 21. 21. 14/ ۵ 7 9 0 9 2 ∞ 9 994 3 က 4 က ς 0 0 4 % _ The other half of First year students attend the Courses 1-6 of II semester first. 12 17 18 15 15 1 15 6 6 _ Language and Writing Skills-1 NLN100 (Non-graded) Course-10 0 0 0.5 0.25 1.5 Professional Ethics and Social Responsibility-1 Energy Innovation Laboratory B.Tech. Project-I Language and Writing Skills-2 ESP300 **NEN110** (Non-graded) NLN101 (Non-graded) **ESD400** Course-9 0 0 0 0 0 0.5 0.25 Social Responsibility-2 Professional Ethics and 4 Heat and Mass Transfer Electrical Energy introduction to **NIN100 NEN111** (Non-graded) HUL2XX **MCL242** ESP260 Non-graded Engineering Laboratory 0 0 0 က Course-8 0 0 က 0 Product Realization through Manufacturing N 4 MCP101 **HUL2XX** 0 4 Course-7 0 0 က Note: Courses 1-6 above are attended in the given order by half of all first year students. N Analog and Digital Electronics Physics Laboratory 3 3 1/0 0/2 ESL261 PYP100 0 4 0 E-3 Course-6 0 0 B. Tech. Project-II (DE) 0 **ESD406** 7 0 Introductory Biology for Chemistry Laboratory Semiconductors for **Energy Systems** SBL100 Energy Storage MTL100 **CMP100 ESL341** 0 4 0 Engineers 2 0 0 0 Calculus **DE-2** 믒 Course-5 0 0 0 0 က 0 က က က က က 0 4 4 Differential Equations 4 Electromagnetism & Quantum Mechanics Linear Algebra and Control System and Electrical Machines Hydrogen Economy Network Analysis **ESL370** 1/0 0/2 **ESL260** ESL262 **ESL352** PYL101 3 1 0 MTL101 0 Automation 0 0 0 003 Course-4 0 0 0 က က Engineering Visualization Fundamentals of Energy Computational Methods N **Energy Resource and** Power Electronics and Drives for Energy Engg. for Energy Systems Introduction to Chemistry Introduction to Energy Efficiency MCP100 CML101 ESL200 ESL373 **ESL400** 0 4 ESL 100 **ESL263** Engineering 0 Utilization 0 2 Course-3 0 0 0 0 က Introduction to Electrical က Introduction to Plasma Concepts Power Systems and Smart Grid Operations Mechanics of Solids Engineering (Lab.) Computer Science **Energy Economics** Introduction to COL100 ESL280 **HUL2XX** APL 105 ESL390 ELP101 0 ESL361 2 ς 0 and Fluids 0 002 Course-2 0 0 0 0 0 က က က က က က က Introduction to Electrical Introduction to Materials Science and Engineering **Engineering Mechanics** Environmental Science က Intelligent Techniques for Energy System Design of Energy Thermodynamics MCL140 MLL100 **CVL100 ESL372** ELL101 **APL100** 0 ESL371 Engineering Engineering 7 0 0 0 Analysis 0 0 0 Systems 001 Course-1 0 0 0 0 က က က ₹ Semester = ≡ ≥ > 5 ₹

21.0

27.0

20.0

B.Tech. in Energy Engineering

Bachelor of Technology in **Materials Engineering**Department of Materials Science and Engineering

Course (Category		Cre	dit	s	MLS302	Research Practice for Beginners	0	0	2	1
	Core Courses				•	MLP352	Mechanical Behavior of Materials Lab.	0	0	3	1.5
	ciences (BS)		2	24		MLP354	Functional Materials Lab.	0	0	3	1.5
	ring Arts and Science (EAS)			9		MLP473	Materials Selection and Design Lab.	0	0	3	1.5
-	ies and Social Sciences (HuSS)		1	5		MLL181	Materials and Sustainable Developments	3	0	0	3
Program	me-linked Courses		1	11		MLD411	B.Tech. Project-I	0	0	8	4
Departm	ental Courses						Total Credits				64
•	nental Core			64							
Departm	nental Electives			2		Departm	ental Electives				
•	tegory Courses			0		MLS300	Independent study	3	0	0	3
	aded Credit requirement		15			MLL361	Iron and Steel Making	2	0	0	2
Non Gra	ded Units		1	1		MLP362	Metallography Lab	0	0	4	2
Institute	Core : Basic Sciences					MLL363	Metal Casting Technology	2	0	2	3
		2	1	0	4	MLD412	B.Tech. Project Part-II	0	0	12	2 6
	Introduction to Chemistry		1	0 4	4	MLD413	Major project in Polymeric Materials	0	0		2 6
	Chemistry Laboratory	0 3	1	0	2 4		Major project in Metallurgy	0	0	12	2 6
	Calculus Linear Algebra and Differential Equations	3	1		4	MLL203	Characterization of Materials-II	3	0	0	
	Electromagnetism & Quantum Mechanics	3	1	0	4	MLL341	Engineering Biomaterials	2	0	0	2
	Physics Laboratory	0	0		2	MLL342	Physical Chemistry of Polymers	3	0	0	3
SBL100	Introductory Biology for Engineers	3		2	4	MLL343	Polymer and Elastomer Technology	3	0	0	3
ODL 100		J	U	_	-	MLL344	Rheology and Processing of Polymers	3	0	2	4
	Total Credits				24	MLL345	Polymer Matrix Composites	2	0	0	2
Institute	Core: Engineering Arts and Sciences					MLL364	Welding Metallurgy	2	0	2	3
		2	1	^	1	MLL365	Powder Metallurgy	3	0	0	3
	Engineering Mechanics	3	1		4	MLL366	Heat Treatment and Surface Engineering	2	0	2	3
	Introduction to Computer Science		0			MLL714	Fracture Mechanics	3	0	0	3
ELL101	Environmental Science Introduction to Electrical Engineering	3	1		2	MLL715	Advanced Engineering Materials	3	0	0	3
	Introduction to Electrical Engineering (Lab)	0			1	MLL716	Engineering Failure Analysis & Prevention	3	0	0	3
	Introduction to Engineering Visualization	0			2	MLL717	Engineering Plastics and Specialty Polymers	3	0	0	3
	Product Realization through Manufacturing		0		2	MLL729	Polymer Blends and Composites	3	0	0	3
IVICI IUI		U	U	-		MLL730	Diffusion & Kinetics	3	0	0	3
	Total Credits				19	MLL732	Porous Materials	3	0	0	3
Program	me-Linked Basic/Engineering Arts/Scien	ces	Co	re		MLL733	Polymer Reaction Engineering	3	0	0	3
	Numerical Methods and Computations	3		0	3	MLL734	Texture and Grain Boundary Engineering	3	0	0	3
	Solid Mechanics	3	1		4		in metals and alloys				
CLL110	Transport Phenomena	3	1		4	MLL735	Polymer Product & Mould Design	3	0	0	3
OLLIIO	·	J	•	U		MLL736	Tribology and Surface Engg. of Materials	3	0	0	3
	Total Credits				11	MLL738	Electronic Devices and Characterization	3	0	0	3
Humanit	ies and Social Sciences					MLL740	Nanostructures and Nanomaterials	3		0	
			4			MLL742	Micro and nanofabrication in Materials Engg	. 3	0	0	3
	from Humanities, Social Sciences and Manag	gem	ent		45	MLL744	Materials for Additive Manufacturing	3	0	0	3
ollered u	nder this category				15	MLL746	Crystals, Symmetry, and Tensors	3	2	0	5
Departm	ental Core					MLL729	Polymer Blends and Composites	3	0	0	3
	Introduction to Materials Science & Engg.	વ	0	2	4	MLL733	Polymer Reaction Engineering	3	0	0	3
	Structure of Materials	2	1	0	3	MLL735	Polymer Product and Mould Design	2	0	2	3
	Intro to Thermodynamics of Materials	3	1		4	MLL741	Biodegradable Polymeric Materials	3	0	0	3
	Characterization of Materials-I	3			4.5	PYL704	Science and Technology of Thin Films	3	0	0	3
	Phase Equilibria and Transformations	2	1	0	3	MLL748	Solid State Diffusion and Kinetics	3	0	0	3
	Math. Methods in Materials Engineering	2	1		3	MLL750	Imperfections in Materials and Applications	3	0	0	3
	Introduction to Polymeric Materials	3		2		MLL752	Creep and Superplasticity of Materials	3	0	0	3
MLL251	Mechanical Behavior of Materials	3	1		4	MLL760	Materials Simulation Methods Using High	2	0	2	3
	Electronic, Optical and Magnetic	3	0		3		Performance Computing				
	Properties of Materials	Ü	Ū	-	٥	PHL704	Science and Technology of thin films	3	0	0	3
MLI 371	Materials Processing	2	0	2	3		Principles and practices of NMR and	3	0		3
	Materials Modelling	1		4	3		Optical Spectroscopy				
	Principles of metal extraction	3	1		4	APL736	Multiscale Modelling of Crystalline Materials	3	0	2	4
	Corrosion and Degradation of Materials	3		2			Chemistry of Nanostructured Materials	3	0	0	
	Materials Selection and Design	3		0	3		Electromagnetics	3			4
	· · · · · · · · · · · · · · · · · · ·	_	-	-	-		-	-			

Total = 155.0

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Contact Hours			31.0			24.0				22.0			23.0			25.0			25.0		,	28.0		13.0
stinU babarg-noN			2.25 3			25 2				0			0 2			0 2			0 2			0 28		0
Credits			19.0 2.			18.0 1.25				20.0			20.5			22.0			20.0			22.5		13.0
۵۰۰۰			14 15			9				4 20			5 20			6 22			10 20			11 22		0
-			က			က	st.			က			က			2			_			2		_
			6			12	ter fir			15			15			717			14			15		12
Op-asinoO	NLN100	Language and Writing Skills-1 (Non-graded)	0 0 2 1				1-6 of II semes																	
6-92110J	NEN110	Professional Ethics and Social Responsibility-1 (Non-graded)	0 0 0.5 0.25	NLN101	Language and Writing Skills-2 (Non-graded)	0 0 2 1	The other half of First year students attend the Courses 1-6 of II semester first																	
8-921UOJ	NIN100	Introduction to Engineering (Non-graded)	0 0 2 1	NEN111	Professional Ethics and Social Responsibility-2 (Non-graded)	0 0 0.5 0.25	First year students										HUL2XX (II)		3 1 0 4					
Course-7	MCP101	Product Realization through Manufacturing	0 0 4 2				The other half of							DEI	Environmental Science Departmental Elective-I	3 0 0 3	MLP 354	Functional Materials Lab	0 0 3 1.5	HUL2XX (III)		3 1 0 4		
Gourse-6	PYP100	Physics Laboratory	0 0 4 2				if of all first year students.	HUL2XX (I)		3 1 0 4	MTL107	Numerical Methods and Computation	3 0 0 3	CVL100	Environmental Science	2 0 0 2	MLP352	Mechanical Behavior of Materials Lab	0 0 3 1.5	001		3 0 0 3		
Gourse-5	MTL100	Calculus	3 1 0 4	CMP100	Chemistry Laboratory	0 0 4 2	der by half of all fir				MLL242	Introduction to Polymeric Materials	3 0 2 4	MLL213	Materials Modelling	1 0 4 3	MLS302	Research Practice for Beginners	0 0 2 1	DE 3		3 0 0 3		
Course-4	PYL101	Electromagnetism & Quantum Mechanics	3 1 0 4	MTL101	Linear Algebra and Differential Equations	3 1 0 4	ed in the given ord	MLL103	Intro. to Thermodynamics of Materials	3 1 0 4	MLL212	Mathematical Methods in Materials Engg.	2 1 0 3	MLL371	Materials Processing	2 0 2 3	MLL264	Glass and Ceramics	2 0 0 2	MLL262	Principles of Metal Extraction	3 1 0 4	HUL3XX	3 0 0 3
Course-3	MCP100	Introduction to Engineering Visualization	0 0 4 2	_	Introduction to Chemistry	3 1 0 4	Note: Courses 1-6 above are attended in the given order by hal	MLL100	Intro. to Materials Science & Engineering	3 0 2 4	MLL202	Phase Equilibria and Transformations	2 1 0 3	MLL253	Electronic, Optical & Magnetic Props. of Mat.	3 0 0 3	MLL372	Materials Selection and Design	3 0 0 3	MLD411	B.Tech. Project-I	0 0 8 4	003	3 1 0 4
Course-2	ELP101		0 0 2 1	C0L100	Introduction to Computer Science	3 0 2 4	Note: Courses 1-	SBL100	Intro. to Biology for Engineers	3 0 2 4	MLL104	Characterization of Materials-I	3 0 3 4.5	MLL251	Mechanical Behavior of Materials	3 1 0 4	MLL452	Corrosion and Degradation of Materials	3 0 2 4	MLL181	Materials and Sustainable Development	3	002	3 0 0 3
F-921100	ELL101	Introduction to Electrical Introduction to Electrical Engineering (Lab.)	3 1 0 4	APL100	Engineering Mechanics	3 1 0 4		APL104	Solid Mechanics	3 1 0 4	MLL102	Structure of Materials	2 1 0 3	CLL110	Transport Phenomena	3 1 0 4	DE 2		3 0 0 3	MLP473	Materials Selection and Design Lab	0 0 3 1.5	DE 4	3 0 0 3
Semester		_			=				≡			≥			>			5			=			

Bachelor of Technology in **Mechanical Engineering**Department of Mechanical Engineering

The ever	rall Credit Structure						MCI 106	Fluid Mechanics	3	1	0) 4
			Cr/	edit	_			Acoustics and Noise Control	3	0		
	Category Core Courses		CIE	anı	5			Vibration Engineering	3	0		
	ciences (BS)		:	24			MCL318	Introduction to Orbital Mechanics	3	0	0	3
	ring Arts and Science (EAS)			19				Automotive Systems	3	0		
	ies and Social Sciences (HuSS)			15				Power Train Design	3	0		
	me-linked Courses			11				Special Topics Production Engineering	3	0		
Departm	ental Courses							Industrial Automation	3	0		4
Departm	nental Core		6	64				Advances in Welding Advanced Machining Processes	3	0		
	nental Electives			12				Mechatronic Applications in Manufacturing	3	0		
•	tegory Courses			10				Gas Dynamics and Propulsion	3	0		
	aded Credit requirement			55				Introduction to Combustion	3	Ö		
Non Gra	ded Units		•	11			MCL344	Refrigeration and Air-conditioning	3	0	2	4
Inetitute	Coro : Pagio Sciences							Reciprocating Internal Combustion Engines		0		
	Core : Basic Sciences					_		Turbomachinery	3	0		4
	Introduction to Chemistry			0				Intermediate Heat Transfer	3	0		
	Chemistry Laboratory	0		4		2		Thermal Management of Electronics	3	0		
	Calculus	3		0				Mechanical Engineering Product Synthesis	1	0		2
	Linear Algebra and Differential Equations	3				4		Investment Planning Value Engineering	3	0		: 4
	Electromagnetism & Quantum Mechanics	3				-		OR Methods in Policy and Governance	3	0		. 4
	Physics Laboratory	0	0			2		Quality and Reliability Engineering	3	0		3
SBL100	Introductory Biology for Engineers	3	0	2				Special Topics in Industrial Engineering	3	0		3
	Total Credits				2	24		Special Topics in Mechanical Engineering	3	0	0	
Institute	Core: Engineering Arts and Sciences							Refrigeration and Air Conditioning Product Design	1	0	0) 1
		2	1	0		1	MCD412	B.Tech. Project-II	0	0		4 7
	Engineering Mechanics Introduction to Computer Science			2				Automotive Structural Design	2	0		3
	Environmental Science			0		2		Design of Brake Systems	2	0		3
	Introduction to Electrical Engineering			0				Modelling and Experiments in Heat Transfer				
	Introduction to Electrical Engineering (Lab)			2				ThermoFluid Analysis of Biosystems	3	0		3
	Introduction to Engineering Visualization	0						Electrochemical Energy Systems Experimental Methods	3	0		
	Product Realization through Manufacturing	0						Thermal Turbomachines	3	0		
11101 101	Total Credits	·	·	•		- 19		Fracture Mechanics in Design	2	0		
	Total Credits				1	19		Engineering Acoustics	3	0		
Program	me-Linked Basic/Engineering Arts/Scien	ces	Co	ore				Active Noise Control	3	0	0	3
MLL100	Introduction to Materials Science	3	0	2		4		Orthopedic Biomechanics and Implant Design	2			
	and Engineering							Design for Noise, Vibration and Harshness	2			3
MTL107	Numerical Methods and Computations	3		0		3		Mechatronics Product Design	2	0		
MTL108	Introduction to Statistics	3	1	0		4		Machine Tool Design	2	0		3
	Total Credits				1	11		Design for Manufacture and Assembly Automotive Prime Movers	2	0		
	to a seed O setal O stances							Mechanical Design of Prime Mover Elements		0		
Humanit	ies and Social Sciences						MCL723	Vehicle Dynamics	2			3
Courses	from Humanities, Social Sciences and Manag	gem	ent					Biomechanics of Trauma in Automotive Design	3	0	0	3
offered u	nder this category				1	15		Design Electronic Assist Systems in Automobiles			0	3
Donartm	ental Core							Design of Steering Systems	3	0		
		_		_	_	_		Nanomechanics	2	0		
APL104		3						Designing with Advanced Materials	3	0	2	
	Fluid Mechanics	3	1					Analytical Dynamics	3	0	0	
	Kinematics and Dynamics of Machines	3	0			4		Air Pollution: Sources and Apportionment Automotive Design	3	0	2	
	Manufacturing Processes-I Engineering Thermodynamics	3	0			3 4		Dynamics of Multibody Systems	2	0	2	
	Mechanical Engineering Drawing	2	0			4 3.5		Plant Equipment Design	3	Ö	0	
	Design of Machines	3	0			3.3 4		Design of Precision Machines	2	0	2	
	Control Theory and Applications	3	0			- 4		Mechatronics Product Design	3	0	2	4
	Manufacturing Processes-II	3	0			3	MCL750	Product Design and Manufacturing	1	0	4	. 3
	Manufacturing Laboratory-I	0		2			MCL753	Manufacturing Informatics	3	0	2	4
	Energy Systems and Technologies			5 1		4		Service System Design	3	0	0	
	Heat and Mass Transfer	3		0				Supply Chain Management	3	0	0	
	Introduction to Operations Research	3		0				Entrepreneurship	3	0	0	
	Mechanical Engineering Laboratory-I	0		3			MCL 775	Project Management Special Topics in IE	3	0	0	
	CAD and Finite Element Analysis	3	0					Advances in Metal Forming	3	0		
	Manufacturing Laboratory-II	0	0			1		Machine Tool Design	3	0		
	Manufacturing System Design	3	0			3		Surface Engineering	3	0	2	
	Mechanical Engineering Laboratory-II	0	0			2		Laser Processing of Materials	3	Ö	2	
	B.Tech. Project	0	0			4		Freedom and Constraints in Design	3	0	0) 3
	CAM and Automation	2	0	2		3		Medical Robotics	2	0	2	
	Total Credits				•	64		Convective Heat Transfer	3	0		
					١	•		Heating, Ventilating and Air-conditioning	3	0		
Departm	ental Electives							Rotor Dynamics	2	0		3
MCD310	Mini Project	0	0	6		3		Advanced Operations Research	3	0	U	3
MCL104	Solid Mechanics	3	1	0		4	*with perm	ission of course coordinator only				

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	6-92110O	NEN110	Professional Ethics and Social Responsibility-1 (Non-graded)	1 0 0 0.5 0.25	NLN101	and Language and y-2 Writing Skills-2 (Non-graded)	0.25 0 0 2	The other half of First year students attend the Courses 1-6 of II semester first.																	
	8-92YUOJ	NIN100	Introduction to Engineering ing (Non-graded)	2 0 0 2	NEN111	Professional Ethics and Social Responsibility-2 (Non-graded)	0 0 0.5 0	of First year stude									4			4					
	F-9s1uoJ	MCP101	Product Realization y through Manufacturing	2 0 0 4				4						4	HUL2XX		1 3 1 0	HUL2XX	901	2 3 1 0			3		
	g-əsinoJ	PYP100	Physics Laboratory	4 0 0 4		٨	2	Il first year studen		es	4	HUL2XX	- Bu	5 3 1 0	MCP231	Manufacturing Laboratory-I	4 0 0 2	CVL100	Environmental Science	1 2 0 0	DE 2 (3)		2 3 0 0		
	g-asınoɔ	MTL100	Calculus	3 1 0	CMP100	Chemistry Laboratory	0 0 4	order by half of al	MCL111	Kinematics and Dynamics of Machines	3 0 2	MCL201	Mechanical Engineering Drawing	2 0 3 3	MCL211	Design of Machines	3 0 2	MCP331	ng Manufacturing Laboratory-II	.5 0 0 2	MCP401	Mechanical Engineering Lab-II	0 0 4	HUL3XX	
)	₽-9s1uoJ	PYL101	Electromagnetism & nn Quantum Mechanics	3 1 0 4	MTL101	Linear Algebra and Differential Equations	3 1 0 4	ided in the given	MCL140	Engineering Thermodynamics	3 1 0 4	MTL108	Introduction to Statistics	3 1 0 4	MTL107	Numerical Methods and Computations	3 0 0 4	MCP301	CAD and Finite Element Mechanical Engineering Analysis Lab-I	0 0 3 1	00 1 (3)		3 0 0 3	DE 4 (3)	
)	6-921100	MCP100	Introduction to Engineering Visualization	0 0 4 2	CML101	Introduction to Chemistry	3 1 0 4	Note: Courses 1-6 above are attended in the given order by half of all first year students.	APL104	Solid Mechanics	3 1 0 4	MCL241	Energy Systems and Technologies	3 0.5 1 4	MCL242	Heat and Mass Transfer	3 1 0 4	MCL311	CAD and Finite Elemen Analysis	3 0 2 4	DE 1 (3)		3 0 0 3	0C 3 (4)	
	S-9s1100	ELP101	Introduction to Electrical Engineering (Lab.)	0 0 2 1	C0L100	Introduction to Computer Science	3 0 2 4	Note: Courses 1-	APL106	Fluid Mechanics	3 1 0 4	MCL131	Manufacturing Processes-I	3 0 0 3	MCL231	Manufacturing Processes-II	3 0 0 3	MCL212	Control Theory and Applications	3 0 2 4	MCD411	B.Tech. Project	0 0 8 4	00 2 (3)	
	F-921U0J	ELL101	Introduction to Electrical Introduction to Electrical Engineering (Lab.)	3 1 0 4	APL100	Engineering Mechanics	3 1 0 4		MLL100	Introduction to Materials Science and Engineering	3 0 2 4	SBL100	Introductory Biology for Engineers	3 0 2 4	MCL261	Introduction to Operations Research	3 0 0 3	MCL361	Manufacturing System Design	3 0 0 3	MCL431	CAM and Automation	2 0 2 3	DE 3 (3)	
	Semester	1	_		1	=			1	=		l	≥		l	>		1	5		l	₹			₹

Bachelor of Technology in Production and Industrial Engineering Department of Mechanical Engineering

Course Category Institute Core Courses Basic Sciences (BS) Engineering Arts and Science Humanities and Social Science Programme-linked Courses Departmental Courses Departmental Electives Open Category Courses Total Graded Credit requirer Non Graded Units Institute Core: Basic Science CML101 Introduction to Chet CMP100 Chemistry Laborato MTL100 Calculus MTL101 Linear Algebra and	ees (HuSS)		1 1 .	24 19 15 11	.o	MCL3 MCL3 MCL3 MCL3	16 18 21	Acoustics and Noise Control Vibration Engineering Introduction to Orbital Mechanics Automotive Systems	3 3 3 3		0 0 2	3 3
Basic Sciences (BS) Engineering Arts and Science Humanities and Social Science Programme-linked Courses Departmental Courses Departmental Electives Open Category Courses Total Graded Credit requirer Non Graded Units Institute Core: Basic Science CML101 Introduction to Cher CMP100 Chemistry Laborato MTL100 Calculus	ees (HuSS)		1	19 15		MCL3 MCL3	21	Automotive Systems	3	0	2	
Engineering Arts and Science Humanities and Social Science Programme-linked Courses Departmental Courses Departmental Core Departmental Electives Open Category Courses Total Graded Credit requires Non Graded Units Institute Core: Basic Science CML101 Introduction to Chel CMP100 Chemistry Laborato MTL100 Calculus	ees (HuSS)		1	19 15		MCL3		,				4
Humanities and Social Science Programme-linked Courses Departmental Courses Departmental Core Departmental Electives Open Category Courses Total Graded Credit requires Non Graded Units Institute Core: Basic Science CML101 Introduction to Chell CMP100 Chemistry Laborato MTL100 Calculus	ees (HuSS)		6	15			22	Dower Train Design	2	Λ		
Departmental Courses Departmental Core Departmental Electives Open Category Courses Total Graded Credit requirer Non Graded Units Institute Core: Basic Science CML101 Introduction to Cher CMP100 Chemistry Laborato MTL100 Calculus	nent		6	11				Power Train Design			0	
Departmental Core Departmental Electives Open Category Courses Total Graded Credit requires Non Graded Units Institute Core: Basic Science CML101 Introduction to Cher CMP100 Chemistry Laborate MTL100 Calculus	nent							Special Topics Production Engineering	3		0	3 4
Departmental Electives Open Category Courses Total Graded Credit requirer Non Graded Units Institute Core: Basic Science CML101 Introduction to Cher CMP100 Chemistry Laborate MTL100 Calculus	nent							Industrial Automation Advances in Welding	3		2	
Open Category Courses Total Graded Credit requirer Non Graded Units Institute Core: Basic Science CML101 Introduction to Cher CMP100 Chemistry Laborato MTL100 Calculus	nent			66				Advanced Machining Processes	3		0	
Total Graded Credit requirer Non Graded Units Institute Core: Basic Science CML101 Introduction to Cher CMP100 Chemistry Laborate MTL100 Calculus	nent			12				Mechatronic Applications in Manufacturing	3			4
Non Graded Units Institute Core : Basic Science CML101 Introduction to Cher CMP100 Chemistry Laborate MTL100 Calculus	nent			10				Gas Dynamics and Propulsion	3	0	2	4
Institute Core : Basic Science CML101 Introduction to Cher CMP100 Chemistry Laborate MTL100 Calculus			15) / 1				Introduction to Combustion	3		0	
CML101 Introduction to Cher CMP100 Chemistry Laborato MTL100 Calculus								Refrigeration and Air-conditioning	3		2	
CMP100 Chemistry Laborato MTL100 Calculus	es							Reciprocating Internal Combustion Engines	3	0		4
MTL100 Calculus	nistry	3	1	0	4			Turbomachinery Intermediate Heat Transfer	3	0	2	
	ry	0	0	4	2			Thermal Management of Electronics		0		
MTL101 Linear Algebra and		3	1	0	4			Mechanical Engineering Product Synthesis	1		2	
	Differential Equations	3	1	0	4			Investment Planning	3	0		
PYL101 Electromagnetism &	Quantum Mechanics	3	1			MCL3	64	Value Engineering	3	0	2	4
PYP100 Physics Laboratory		0	0	4	2	MCL3	66	OR Methods in Policy and Governance	3	0	0	3
SBL100 Introductory Biology	for Engineers	3	0	2	4			Quality and Reliability Engineering	3		0	
Total Credits					24			Special Topics in Industrial Engineering	3		0	
								Special Topics in Mechanical Engineering		0		
Institute Core: Engineering								Refrigeration and Air Conditioning Product Design	0		0	1 4 7
APL100 Engineering Mecha		3	1					B.Tech. Project-II Automotive Structural Design	-			4 7
COL100 Introduction to Com		3		2				Design of Brake Systems		0		
CVL100 Environmental Scie								Modelling and Experiments in Heat Transfer				
ELL101 Introduction to Elec		3	1					Thermofluid Analysis of Biosystems	3	0		
ELP101 Introduction to Elec		0		2		MCL4	43	Electrochemical Énergy Systems	3	0	0	3
MCP100 Introduction to Engi		0				MCL7	05	Experimental Methods	3			4
MCP101 Product Realization	through Manufacturing	U	U	4				Fracture Mechanics in Design	2		2	
Total Credits					19			Engineering Acoustics	3		0	
Programme-Linked Basic/E	ngineering Arts/Scien	201	Co	ro				Active Noise Control	3 2		0	3
					4			Orthopedic Biomechanics and Implant Design Design for Noise, Vibration and Harshness	2			3
MLL100 Introduction to Materia MTL107 Numerical Methods	•	g 3 3		2	3			Mechatronics Product Design	2	0		
MTL107 Numerical Metrious MTL108 Introduction to Stati	•	3	1	0	4			Network Models for Public Systems	3		0	
	51103	J	٠	U				Machine Tool Design	2		2	
Total Credits					11			Design for Manufacture and Assembly	2		2	
Humanities and Social Scien	nces							Automotive Prime Movers	3	0		
Courses from Humanities, So	rial Sciences and Manac	nem	≙nt					Mechanical Design of Prime Mover Elements		0		
offered under this category	siai odiciloca alla Mallaç	JCIII	CIII		15			Vehicle Dynamics Biomechanics of Trauma in Automotive Design				ა 3
0 ,					. •			Design Electronic Assist Systems in Automobiles				
Departmental Core								Design of Steering Systems		0		
APL104 Solid Mechanics		3	1	0	4			Nanomechanics	2			3
MCL111 Kinematics and Dyr	amics of Machines	3	0	2	4	MCL7	'30	Designing with advanced materials	3	0	2	4
MCL132 Metal Forming and	Press Tools	3	0	0	3			Analytical Dynamics	3	0	0	3
MCL133 Near Net Shape Ma	nufacturing	3		0				Air Pollution: Sources and Apportionment	3		0	
MCL134 Metrology and Qual		3		1				Automotive Design	3	0		
MCL135 Welding and Allied		3		0				Dynamics of Multibody Systems	2		2	
MCL136 Material Removal P		3		0				Plant Equipment Design	3 2		0	3 3
MCL141 Thermal Science fo	ū	3	1		4			Design of Precision Machines Mechatronics Product Design	3			4
MCL201 Mechanical Engine				3				Product Design and Manufacturing	1			3
MCL211 Design of Machines		3		2				Manufacturing Informatics	3			4
MCL212 Control Theory and		3		2				Service System Design	3		0	
MCP232 Production Enginee	-	0		2		MCL7	56	Supply Chain Management	3	0	0	3
MCL261 Introduction to Oper MCP261 Industrial Engineeri		3 0		0 2				Entrepreneurship	3	0		
_	•	3						Project Management	3		0	
MCL262 Stochastic Modellin MCL311 CAD and Finite Ele		3	n	0 2	ى ⊿			Special Topics in IE	3		0	
MCL331 Micro and Nano Ma	-	3	0					Advances in Metal Forming	3		0	
MCP332 Production Enginee		0	0					Machine Tool Design Surface Engineering	3			4 4
MCL361 Manufacturing Syst	-	3	0					Laser Processing of Materials	3			4
MCP361 Industrial Engineeri	•	0	0		1			Freedom and Constraints in Design	3		0	
MCD411 B.Tech. Project	J	0	0		4			Medical Robotics	2		2	
MCL431 CAM and Automatic	n		0					Convective Heat Transfer	3			3
								Heating, Ventilating and Air-conditioning		0		3
Total Credits					Dr							
Total Credits					66			Rotor Dynamics				3
Total Credits Departmental Electives					00			Rotor Dynamics Advanced Operations Research				3

Total = 157.0

B. Tech. in Production and Industrial Engineering

Contact Hours			31.0			24.0				22.0			24.0			23.0			25.0			24.0			19.0
Non-graded Units			2.25			1.25				0			0			0			0			0			0
StibenJ		,	14 19.0			18.0				20.0			21.5			20.5			21.0			18.0			19.0
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Ot-asruoJ	NLN100	Language and Writing Skills-1 (Non-graded)	0 0 2				1-6 of II seme																		
6-9sruoJ	NEN110	Professional Ethics and Social Responsibility-1 (Non-graded)	0 0 0.5 0.25	NLN101	Language and Writing Skills-2 (Non-graded)	0 0 2 1	The other half of First year students attend the Courses 1-6 of II semester first.																		
6-62urse-8	NIN100	Introduction to Engineering (Non-graded)	0 0 2 1	NEN111	Professional Ethics and Social Responsibility-2 (Non-graded)	0 0 0.5 0.25	First year students										CVL100	Environmental Science	2 0 0 2						
Course-7	MCP101	Product Realization through Manufacturing	0 0 4 2				The other half of							MCL262	Stochastic Modelling and Simulation	3 0 0 3	MCL331	Micro and Nano Manufacturing	3 0 0 3						
G-osrse-6	PYP100	Physics Laboratory	0 0 4 2				st year students.				HUL2XX		3 1 0 4	MCP232	Production Engineering Laboratory-I	0 0 2 1	MCL136	Material Removal Processes	3 0 0 3	DE 1 (3)		3 0 0 3	DE 4 (3)		3 0 0 3
Gourse-5	MTL100	Calculus	3 1 0 4	CMP100	Chemistry Laboratory	0 0 4 2	er by half of all fir	HUL2XX		3 1 0 4	MCL201	Mechanical Engineering Drawing	2 0 3 3.5	MCL211	Design of Machines	3 0 2 4	MCP332	Production Engineering Laboratory-II	0 0 2 1	HUL2XX		3 1 0 4	HUL3XX		3 0 0 3
6-esiuoJ	PYL101	Electromagnetism & Quantum Mechanics	3 1 0 4	MTL101	Linear Algebra and Differential Equations	3 1 0 4	d in the given ord	MCL111	Kinematics and Dynamics of Machines	3 0 2 4	MTL108	Introduction to Statistics	3 1 0 4	MTL107	Numerical Methods and Computations	3 0 0 3	MCP261	Industrial Engineering Laboratory-I	0 0 2 1	00 1 (3)		3 0 0 3	DE 3 (3)		3 0 0 3
Course-3	MCP100	Introduction to Engineering Visualization	0 0 4 2	CML101	Introduction to Chemistry	3 1 0 4	above are attende	MCL141	Thermal Science for Manufacturing	3 1 0 4	MCL133	Near Net Shape Manufacturing	3 0 0 3	MCL135	Welding and Allied Processes	3 0 0 3	MCL311	CAD and Finite Element Analysis	3 0 2 4	MCP361	Industrial Engineering Laboratory-II	0 0 2 1	OC 3 (4)		3 1 0 4
Course-2	ELP101		0 0 2 1	COL100	Introduction to Computer Science	3 0 2 4	Note: Courses 1-6 above are attended in the given order by half of all first year students.	APL 104	S	3 1 0 4	MCL132	Metal Forming and Press Tools	3 0 0 3	MCL134	Metrology and Quality Assurance	3 0 1 3.5	MCL212	Control Theory and Applications	3 0 2 4	MCD411	B.Tech. Project	0 0 8 4	00 2 (3)		3 0 0 3
Course-1	ELL101	Introduction to Electrical Introduction to Electrical Engineering (Lab.)	3 1 0 4	APL100	Engineering Mechanics	3 1 0 4		MLL100	Introduction to Materials Science and Engineering	3 0 2 4	SBL100	Introductory Biology for Engineers	3 0 2 4	MCL261	Introduction to Operations Research	3 0 0 3	MCL361	Manufacturing System Design	3 0 0 3	MCL431	CAM and Automation	2 0 2 3	DE 2 (3)		3 0 0 3
Semester		_			=				=			≥			>			>			₹			闄	

Bachelor of Technology in Mathematics and Computing Department of Mathematics

	rall Credit Structure					ELL789	3 ,	3 0	
	Category	(Cred	tit	s		Computer Graphics Computer Vision	3 0	
	Core Courses		2				Deep Learning for Natural Language Processing	3 0	
	ciences (BS) ring Arts and Science (EAS)		24 19				Number Theory	3 0	
	ies and Social Sciences (HuSS)		15				Combinatorics	3 0	
	me-linked Courses		12.5				Boundary Value Problems	3 0	0 3
Departm	ental Courses						Mathematical Programming Techniques	3 0	0 3
•	iental Core		63.5				Measure Integral and Probability	3 0	
	ental Electives		12 10				Mini Project	0 0	
	ntegory Courses aded Credit requirement		156				Parallel Algorithms Numerical Optimization	3 0	
	ded Units		12				Fuzzy Sets and Applications	3 0	
							Neurocomputing and Applications	3 0	
	Core : Basic Sciences	_		_			Stochastic Processes and its Applications	3 0	
	Introduction to Chemistry		1				Category Theory	3 0	0 3
	Chemistry Laboratory Calculus		0				Computational Algebra and its Applications	3 0	
	Linear Algebra and Differential Equations		1				Cryptography	3 0	
	Electromagnetism & Quantum Mechanics		1				Introduction to Chaotic Dynamical Systems	3 0	
	Physics Laboratory		0				Financial Mathematics	3 0	
	Introductory Biology for Engineers	3	0	2	4		Stochastic of Finance Introductory Actuarial Mathematics	3 0	
	Total Credits				24		Advanced Number Theory	3 0	
4144-	Const Engineering Auto and Sciences						Analytic Number Theory	3 0	
	Core: Engineering Arts and Sciences	-	,	<u></u>			Commutative Algebra	3 0	
	Engineering Mechanics		1			MTL739	Representation of Finite Groups	3 0	0 3
	Introduction to Computer Science Environmental Science		0				Fractal Geometry	3 0	
	Introduction to Electrical Engineering		1				Operator Theory	3 0	
	Introduction to Electrical Engineering (Lab)		0				Fourier Analysis	3 0	
	Introduction to Engineering Visualization		0				Mathematical Theory of Coding Advanced Matrix Theory	3 0	
	Product Realization through Manufacturing		0				Mathematical Logic	3 0	
	Total Credits				19		Symbolic Dynamics	3 0	
Droarom	ma Linkad Pasia/Engineering Arts/Science		C 0.				Principles of Computer Graphics	3 0	
	me-Linked Basic/Engineering Arts/Science						Algebraic Geometry	3 0	0 3
COL106	Data Structures and Algorithms	3	0	4	5		Lie Algebras and Lie Groups	3 0	
ELL201	Digital Electronics	3	0	3	4.5		Introduction to Algebraic Topology	3 0	
PYL102	Principles of Electronic Materials	3	0	0	3		Advanced Algorithms	3 0	
	Total Credits				12.5		Basic Ergodic Theory Probability Theory	3 0	
Donortm	entel Core						Introduction to Game Theory	3 0	
	ental Core	_	^	^			Multivariate Statistical Methods	3 0	
	Computer Architecture Design and System Laboratory		0		ა 1.5	MTL768	Graph Theory	3 0	0 3
	Differential Equations		0			MTL773	Wavelets and Applications	3 0	0 3
	Optimization Methods and Applications		0				Graph Algorithms	3 0	
	Linear Algebra and Applications		0			MTL780	Parameterized Algorithms for NP-hard	3 0	0 3
	Algebra		0			MTI 704	Problems	2.0	^
MTL106	Probability and Stochastic Processes		1				Finite Element Theory and Applications Natural Language Processing	3 0	
	Numerical Methods and Computations	3	0	0	3		Modern Methods in Partial	3 0	
	Real and Complex Analysis		1			WITETOL	Differential equations	0 0	•
	Discrete Mathematical Structures		1			MTL793	Numerical Methods for Hyperbolic PDEs	3 0	0 3
	Computing Laboratory		0				Advanced Probability Theory	3 0	0 3
	Analysis and Design of Algorithms Statistical Methods		1 1			MTL795	Numerical Method for Partial	3 1	0 4
WIILJOO	B.Tech. Project		0				Differential Equations		
	B. Teon. 1 Toject		0				Mathematical Analysis in Learning Theory	3 0	
MTD411	Functional Analysis		-				Special Module in Dynamical System Mathematical Foundation of Artificial Intelligence	1 0	
MTD411 MTL421	Functional Analysis Computational Methods for		0	_		IVI I LO I I	- Manachananca i Cultuanon di Altiliciai Illiciilidelice		() '
MTD411 MTL421			0	_					
MTD411 MTL421 MTL445 MTL458	Computational Methods for Differential Equations Operating Systems	3	0		4	MTL843	Mathematical Modeling of Credit Risk	3 0	0 ;
MTD411 MTL421 MTL445 MTL458 MTL782	Computational Methods for Differential Equations Operating Systems Data Mining	3 3	0	2	4	MTL843 MTL851	Mathematical Modeling of Credit Risk Applied Numerical Analysis	3 0 3 0	0 3
MTD411 MTL421 MTL445 MTL458 MTL782	Computational Methods for Differential Equations Operating Systems	3 3	0	2	4	MTL843 MTL851 MTL854	Mathematical Modeling of Credit Risk Applied Numerical Analysis Interpolation and Approximation	3 0	0 ; 0 ;
MTD411 MTL421 MTL445 MTL458 MTL782	Computational Methods for Differential Equations Operating Systems Data Mining	3 3	0	2 2 0	4	MTL843 MTL851 MTL854	Mathematical Modeling of Credit Risk Applied Numerical Analysis	3 0 3 0 3 0	0 ; 0 ;
MTD411 MTL421 MTL445 MTL458 MTL782 MTL783	Computational Methods for Differential Equations Operating Systems Data Mining Theory of Computation Total Credits	3 3	0	2 2 0	4 3	MTL843 MTL851 MTL854 MTL855	Mathematical Modeling of Credit Risk Applied Numerical Analysis Interpolation and Approximation Multiple Decision Procedures in Ranking	3 0 3 0 3 0	0 3 0 3 0 3 0 3
MTD411 MTL421 MTL445 MTL458 MTL782 MTL783	Computational Methods for Differential Equations Operating Systems Data Mining Theory of Computation Total Credits ental Electives	3 3 3	0 0	2 2 0 6	4 3 3.5	MTL843 MTL851 MTL854 MTL855 MTL860 MTL863	Mathematical Modeling of Credit Risk Applied Numerical Analysis Interpolation and Approximation Multiple Decision Procedures in Ranking and Selection Linear Algebra Algebraic Number Theory	3 0 3 0 3 0 3 0 3 0 3 0	0 3 0 3 0 3 0 3 0 3 0 3
MTD411 MTL421 MTL445 MTL458 MTL782 MTL783 Departm COL334	Computational Methods for Differential Equations Operating Systems Data Mining Theory of Computation Total Credits ental Electives Computer Networks	3 3 3	0 0 0	2 2 0 6	4 3 3.5	MTL843 MTL851 MTL854 MTL855 MTL860 MTL863 MTV874	Mathematical Modeling of Credit Risk Applied Numerical Analysis Interpolation and Approximation Multiple Decision Procedures in Ranking and Selection Linear Algebra Algebraic Number Theory Analysis	3 0 3 0 3 0 3 0 3 0 3 0 3 0	0 3 0 3 0 3 0 3 0 3 0 3
MTD411 MTL421 MTL458 MTL458 MTL782 MTL783 Departm COL334 COL728	Computational Methods for Differential Equations Operating Systems Data Mining Theory of Computation Total Credits ental Electives Computer Networks Compiler Design	3 3 3 3	0 0 0	2 2 0 6 2	4 3 3.5 4 4.5	MTL843 MTL854 MTL855 MTL855 MTL860 MTL863 MTV874 MTL882	Mathematical Modeling of Credit Risk Applied Numerical Analysis Interpolation and Approximation Multiple Decision Procedures in Ranking and Selection Linear Algebra Algebraic Number Theory Analysis Applied Analysis	3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0	0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
MTD411 MTL421 MTL445 MTL458 MTL782 MTL783 Departm COL334	Computational Methods for Differential Equations Operating Systems Data Mining Theory of Computation Total Credits ental Electives Computer Networks Compiler Design	3 3 3 3 3	0 0 0	2 2 0 6 :	4 3 3.5 4 4.5 3	MTL843 MTL851 MTL854 MTL855 MTL860 MTL863 MTV874 MTL882 MTL883	Mathematical Modeling of Credit Risk Applied Numerical Analysis Interpolation and Approximation Multiple Decision Procedures in Ranking and Selection Linear Algebra Algebraic Number Theory Analysis	3 0 3 0 3 0 3 0 3 0 3 0 3 0	

Total = 156.0

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Contact Hours			31.0			24.0				23.0			26.0			21.0			21.0			22.0			21.0
Non-graded Units			2.25			1.25				0			0			0			0			0			0
Credits			19.0			18.0 1.25				21.0			21.5			21.0			18.5			20.0			17.0
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Course-10	NLN100	Language and Writing Skills-1 (Non-graded)	0 0 2				1-6 of II seme																		
6-esunoე	NEN110	Professional Ethics and Social Responsibility-1 (Non-graded)	0 0 0.5 0.25	NLN101	Language and Writing Skills-2 (Non-graded)	0 0 2 1	The other half of First year students attend the Courses 1-6 of II semester first																		
6-esruoJ	NIN100	Introduction to Engineering (Non-graded)	0 0 2 1	NEN111	Professional Ethics and Social Responsibility-2 (Non-graded)	0 0 0.5 0.25	First year students																		
Course-7	MCP101	Product Realization through Manufacturing	0 0 4 2				The other half of I																		
g-əsinoƏ	PYP100	Physics Laboratory	0 0 4 2				If of all first year students.	HUL2XX		3 1 0 4	HUL2XX		3 1 0 4	HUL2XX		3 1 0 4	ELP305	Design and System Laboratory	0 0 3 1.5	HUL3XX		3 0 0 3			
G-osruco	MTL100	Calculus	3 1 0 4	CMP100	Chemistry Laboratory	0 0 4 2	er by half of all firs	MTL104	Linear Algebra and Applications	3 0 0 3	MTP290	Computing Laboratory	0 0 4 2	MTL342	Analysis and Design of Algorithms	3 1 0 4	DE 1		3 0 0 3	1 00		3 0 0 3	MTD421	B.Tech. Project	0 0 8 4
6-9sinoJ	PYL101	Electromagnetism & Quantum Mechanics	3 1 0 4	MTL101	Linear Algebra and Differential Equations	3 1 0 4	d in the given orde	CVL100	Environmental Science	2 0 0 2	SBL100	Introduction to Biology for Engineers	3 0 2 4	MTL107	Numerical Methods and Analysis and Design of Computation Algorithms	3 0 0 3	MTL411	Functional Analysis	3 0 0 3	MTL458	Operating Systems	3 0 2 4	DE 4		3 0 0 3
Course-3	MCP100	Introduction to Engineering Visualization	0 0 4 2	CML101	Introduction to Chemistry	3 1 0 4	above are attende	PYL102	Principles of Electronic Materials	3 0 0 3	MTL103	Optimization Methods and Applications	3 0 0 3	MTL105	Algebra	3 0 0 3	MTL390	Statistical Methods	3 1 0 4	DE 2		3 0 0 3	DE 3		3 0 0 3
Course-2	ELP101		0 0 2 1	COL100	Introduction to Computer Science	3 0 2 4	Note: Courses 1-6 above are attended in the given order by ha	MTL180	Discrete Mathematical Structures	3 1 0 4	ELL201	Digital Electronics	3 0 3 4.5	ELL305	Computer Architecture	3 0 0 3	MTL782	Data Mining	3 0 2 4	MTL783	Theory of Computation	3 0 0 3	0C 3		3 0 0 3
Course-1	ELL101	Introduction to Electrical Introduction to Electrical Engineering (Lab.)	3 1 0 4	APL100	Engineering Mechanics	3 1 0 4		COL106	Data Structures & Algorithms	3 0 4 5	MTL122	Real and Complex Analysis	3 1 0 4	MTL106	Probability and Stochastic Processes	3 1 0 4	MTL102	Differential Equations	3 0 0 3	MTL712	Computational Methods for Differential Equations	3 0 2 4	0C 2		3 1 0 4
Semester		-			=			Г	=			2			>			5		Γ	=			=	

Dual Degree Programme: Bachelor of Technology and Master of Technology in Mathematics and Computing Department of Mathematics

The over	rall Credit Structure				MTL712	Computational Methods for Differential	3	0	2	4
	Category	(Cred	lits	MTI 792	Equations Data Mining	2	Λ	2	1
	Core Courses ciences (BS)		24	i	WIIL/02	Data Mining Total Credits	3	U		4 63.5
	ring Arts and Science (EAS)		19			Total Credits				03.3
	ies and Social Sciences (HuSS)		15		Departm	ental Electives				
-	me-linked Courses		12.5	5		Computer Networks			2	
•	ental Courses ental Core		59.5	5	ELL365	,			0	
•	ental Electives		6			Number Theory Combinatorics			0	
	tegory Courses		12			Boundary Value Problems	3	0	0	3
	ech. Credit requirement ded Units		148 11			Mathematical Programming Techniques	3	0	0	3
M.Tech.			''			Measure Integral and Probability	3	0	0	3
	ime Core Courses		24	ļ		Mini Project Parallel Algorithms	0	0	6 0	3
•	me Electives Courses		18			Analytic Number Theory			0	
	Гесh. Requirement aded Requirement		42 190	_		Graph Theory				3
rotal Ort	adda Roquiloment					Wavelets and Applications			0	
Institute	Core : Basic Sciences				MTL780	Parameterized Algorithms for NP-hard Problems	3	0	0	3
	Introduction to Chemistry	3		4	MTL799	Mathematical Analysis in Learning Theory	3	0	0	3
	Chemistry Laboratory Calculus		0 4 1 0							
	Linear Algebra and Differential Equations	3		4	Program	Core				
PYL101		3		4		Multivariate Statistical Methods			0	
	Physics Laboratory			2		Finite Elements and Applications			0 12	
SBL100	Introductory Biology for Engineers	3	0 2			Major Project Part-I (MT) Major Project Part-II (MT)				12
	Total Credits			24		Major Project Part-I			8	
Institute	Core: Engineering Arts and Sciences				MTD854*	Major Project Part-II	0	0	28	3 14
APL100	Engineering Mechanics	3	1 0	4		Total Credits				22
	Introduction to Computer Science	3		4	*MTD853	and MTD854 together are alternatives to	M	TD	85 [,]	1 and
	Environmental Science		0 0		MTD852	· ·				
	Introduction to Electrical Engineering	3	1 0	4						
F1 P101	Introduction to Electrical Engineering (Lah)	0	0 2	1	Drogram	Electives				
	Introduction to Electrical Engineering (Lab) Introduction to Engineering Visualization		0 2 0 4			Electives Compiler Design	2	Λ	2	4.5
MCP100	Introduction to Electrical Engineering (Lab) Introduction to Engineering Visualization Product Realization through Manufacturing	0		2	COL728	Compiler Design				4.5 4
MCP100	Introduction to Engineering Visualization	0	0 4	2					2	
MCP100 MCP101	Introduction to Engineering Visualization Product Realization through Manufacturing <i>Total Credits</i>	0	0 4 0 4	2 2 19	COL728 ELL715 ELL786 ELL789	Compiler Design Digital Image Processing Multimedia Systems Intelligent Systems	3 3 3	0 0 0	2 0 0	4 3 3
MCP100 MCP101 Program	Introduction to Engineering Visualization Product Realization through Manufacturing Total Credits me-Linked Basic/Engineering Arts/Scient	0 0	0 4 0 4 Core	2 2 19	COL728 ELL715 ELL786 ELL789 ELL792	Compiler Design Digital Image Processing Multimedia Systems Intelligent Systems Computer Graphics	3 3 3	0 0 0	2 0 0	4 3 3 3
MCP100 MCP101 Program	Introduction to Engineering Visualization Product Realization through Manufacturing <i>Total Credits</i>	0 0 ces	0 4 0 4 Core	2 2 19	COL728 ELL715 ELL786 ELL789 ELL792 ELL793	Compiler Design Digital Image Processing Multimedia Systems Intelligent Systems Computer Graphics Computer Vision	3 3 3 3	0 0 0 0	2 0 0 0	4 3 3 3 3
MCP100 MCP101 Program COL106 ELL201	Introduction to Engineering Visualization Product Realization through Manufacturing Total Credits me-Linked Basic/Engineering Arts/Scien Data Structures and Algorithms	0 0 ces 3	0 4 0 4 Core	2 2 19 e 5 4.5	COL728 ELL715 ELL786 ELL789 ELL792 ELL793 ELL884 MTL704	Compiler Design Digital Image Processing Multimedia Systems Intelligent Systems Computer Graphics Computer Vision Deep Learning for Natural Language Processing Numerical Optimization	3 3 3 3 3	0 0 0 0 0	2 0 0 0	4 3 3 3 3 3
MCP100 MCP101 Program COL106 ELL201	Introduction to Engineering Visualization Product Realization through Manufacturing Total Credits me-Linked Basic/Engineering Arts/Scien Data Structures and Algorithms Digital Electronics	0 0 ces 3	0 4 0 4 Core 0 4 0 3	2 2 19 e 5 4.5	COL728 ELL715 ELL786 ELL789 ELL792 ELL793 ELL884 MTL704 MTL717	Compiler Design Digital Image Processing Multimedia Systems Intelligent Systems Computer Graphics Computer Vision Deep Learning for Natural Language Processing Numerical Optimization Fuzzy Sets and Applications	3 3 3 3 3 3 3	0 0 0 0 0 0	2 0 0 0 0 0 0	4 3 3 3 3 3 3 3
MCP100 MCP101 Program COL106 ELL201 PYL102	Introduction to Engineering Visualization Product Realization through Manufacturing Total Credits me-Linked Basic/Engineering Arts/Scien Data Structures and Algorithms Digital Electronics Principles of Electronic Materials Total Credits	0 0 ces 3	0 4 0 4 Core 0 4 0 3	2 2 19 5 4.5 3	COL728 ELL715 ELL786 ELL789 ELL792 ELL793 ELL884 MTL704 MTL717	Compiler Design Digital Image Processing Multimedia Systems Intelligent Systems Computer Graphics Computer Vision Deep Learning for Natural Language Processing Numerical Optimization Fuzzy Sets and Applications Neurocomputing and Applications	3 3 3 3 3 3 3 3	0 0 0 0 0 0 0	2 0 0 0 0 0 0 0	4 3 3 3 3 3 3 3 3 3
MCP100 MCP101 Program COL106 ELL201 PYL102	Introduction to Engineering Visualization Product Realization through Manufacturing Total Credits Ime-Linked Basic/Engineering Arts/Scien Data Structures and Algorithms Digital Electronics Principles of Electronic Materials Total Credits ies and Social Sciences	0 0 3 3 3	Cor 0 4 0 3 0 0	2 2 19 5 4.5 3	COL728 ELL715 ELL786 ELL789 ELL792 ELL793 ELL884 MTL704 MTL717 MTL720 MTL725	Compiler Design Digital Image Processing Multimedia Systems Intelligent Systems Computer Graphics Computer Vision Deep Learning for Natural Language Processing Numerical Optimization Fuzzy Sets and Applications Neurocomputing and Applications Stochastic Processes and its Applications	3 3 3 3 3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0	2 0 0 0 0 0 0 0 0	4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
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Program COL106 ELL201 PYL102 Humanit Courses offered u Departm ELL305	Introduction to Engineering Visualization Product Realization through Manufacturing Total Credits Ime-Linked Basic/Engineering Arts/Scien Data Structures and Algorithms Digital Electronics Principles of Electronic Materials Total Credits ies and Social Sciences from Humanities, Social Sciences and Manageder this category ental Core Computer Architecture	0 (0 ()	0 4 0 4 Corr 0 4 0 3 0 0 0	2 2 19 6 5 4.5 3 12.5	COL728 ELL715 ELL786 ELL789 ELL792 ELL793 ELL884 MTL704 MTL717 MTL720 MTL725 MTL728 MTL728 MTL730 MTL731 MTL731	Compiler Design Digital Image Processing Multimedia Systems Intelligent Systems Computer Graphics Computer Vision Deep Learning for Natural Language Processing Numerical Optimization Fuzzy Sets and Applications Neurocomputing and Applications Stochastic Processes and its Applications Category Theory Computational Algebra and its Applications Cryptography Introduction to Chaotic Dynamical Systems Financial Mathematics	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	$\begin{smallmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 $	$\begin{smallmatrix} 2 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 &$	4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
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Program COL106 ELL201 PYL102 Humanit Courses offered u Departm ELL305 ELP305 MTL102 MTL103 MTL104 MTL105 MTL106 MTL107 MTL122 MTL180	Introduction to Engineering Visualization Product Realization through Manufacturing Total Credits Ime-Linked Basic/Engineering Arts/Scien Data Structures and Algorithms Digital Electronics Principles of Electronic Materials Total Credits ies and Social Sciences from Humanities, Social Sciences and Management of this category ental Core Computer Architecture Design and System Laboratory Differential Equations Optimization Methods and Applications Linear Algebra and Applications Algebra Probability and Stochastic Processes Numerical Methods and Computations	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 4 4 Correlation 0 0 4 0 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 2 19 5 4.5 3 12.5 15 3 3 4 3 4 4 4	COL728 ELL715 ELL786 ELL792 ELL793 ELL884 MTL704 MTL717 MTL720 MTL725 MTL728 MTL728 MTL730 MTL731 MTL731 MTL732 MTL733 MTL734 MTL735 MTL735 MTL736 MTL738 MTL738 MTL738 MTL739 MTL739 MTL741 MTL742 MTL743	Compiler Design Digital Image Processing Multimedia Systems Intelligent Systems Computer Graphics Computer Vision Deep Learning for Natural Language Processing Numerical Optimization Fuzzy Sets and Applications Neurocomputing and Applications Stochastic Processes and its Applications Category Theory Computational Algebra and its Applications Cryptography Introduction to Chaotic Dynamical Systems Financial Mathematics Stochastic of Finance Introductory Actuarial Mathematics Advanced Number Theory Analytic Number Theory Commutative Algebra Representation of Finite Groups Fractal Geometry	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	$\begin{smallmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 $	$\begin{smallmatrix} 2 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 &$	4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
Program COL106 ELL201 PYL102 Humanit Courses offered u Departm ELL305 ELP305 MTL102 MTL103 MTL104 MTL105 MTL106 MTL107 MTL122 MTL180 MTP290 MTL342	Introduction to Engineering Visualization Product Realization through Manufacturing Total Credits Ime-Linked Basic/Engineering Arts/Scient Data Structures and Algorithms Digital Electronics Principles of Electronic Materials Total Credits ies and Social Sciences from Humanities, Social Sciences and Management of the scategory ental Core Computer Architecture Design and System Laboratory Differential Equations Optimization Methods and Applications Linear Algebra and Applications Algebra Probability and Stochastic Processes Numerical Methods and Computations Real and Complex Analysis Discrete Mathematical Structures Computing Laboratory Analysis and Design of Algorithms	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 4 0 4 Correlation 0 0 4 0 3 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 1 0 0 0 0 1 0	2 2 19 5 4.5 3 12.5 15 3 3 4 3 4 4 4 2 4	COL728 ELL715 ELL786 ELL792 ELL793 ELL884 MTL704 MTL717 MTL720 MTL725 MTL728 MTL728 MTL730 MTL731 MTL731 MTL732 MTL733 MTL734 MTL735 MTL734 MTL735 MTL736 MTL738 MTL738 MTL738 MTL739 MTL741 MTL742 MTL743 MTL744 MTL745	Compiler Design Digital Image Processing Multimedia Systems Intelligent Systems Computer Graphics Computer Vision Deep Learning for Natural Language Processing Numerical Optimization Fuzzy Sets and Applications Neurocomputing and Applications Stochastic Processes and its Applications Category Theory Computational Algebra and its Applications Cryptography Introduction to Chaotic Dynamical Systems Financial Mathematics Stochastic of Finance Introductory Actuarial Mathematics Advanced Number Theory Analytic Number Theory Commutative Algebra Representation of Finite Groups Fractal Geometry Operator Theory Fourier Analysis Mathematical Theory of Coding Advanced Matrix Theory	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	$\begin{smallmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 $	$\begin{smallmatrix} 2 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 &$	4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
Program COL106 ELL201 PYL102 Humanit Courses offered u Departm ELL305 ELP305 MTL102 MTL103 MTL104 MTL105 MTL106 MTL107 MTL122 MTL180 MTP290 MTL342 MTL783	Introduction to Engineering Visualization Product Realization through Manufacturing Total Credits Ime-Linked Basic/Engineering Arts/Scient Data Structures and Algorithms Digital Electronics Principles of Electronic Materials Total Credits ies and Social Sciences from Humanities, Social Sciences and Management of the scategory ental Core Computer Architecture Design and System Laboratory Differential Equations Optimization Methods and Applications Linear Algebra and Applications Algebra Probability and Stochastic Processes Numerical Methods and Computations Real and Complex Analysis Discrete Mathematical Structures Computing Laboratory Analysis and Design of Algorithms Theory of Computation	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 4 4 Correlation 0 0 4 0 3 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 1 0 0 0 0 1 1 0	2 2 19 5 4.5 3 12.5 15 3 3 4 3 4 4 2 4 3	COL728 ELL715 ELL786 ELL792 ELL793 ELL884 MTL704 MTL717 MTL720 MTL725 MTL728 MTL728 MTL730 MTL731 MTL731 MTL732 MTL733 MTL734 MTL735 MTL734 MTL735 MTL736 MTL736 MTL737 MTL738 MTL737 MTL738 MTL738 MTL739 MTL741 MTL742 MTL742 MTL743 MTL744	Compiler Design Digital Image Processing Multimedia Systems Intelligent Systems Computer Graphics Computer Vision Deep Learning for Natural Language Processing Numerical Optimization Fuzzy Sets and Applications Neurocomputing and Applications Stochastic Processes and its Applications Category Theory Computational Algebra and its Applications Cryptography Introduction to Chaotic Dynamical Systems Financial Mathematics Stochastic of Finance Introductory Actuarial Mathematics Advanced Number Theory Analytic Number Theory Commutative Algebra Representation of Finite Groups Fractal Geometry Operator Theory Fourier Analysis Mathematical Theory of Coding Advanced Matrix Theory Mathematical Logic	333333333333333333333333333333333333333	$\begin{smallmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 $	$2 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ $	4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
Program COL106 ELL201 PYL102 Humanit Courses offered u Departm ELL305 ELP305 MTL102 MTL103 MTL104 MTL105 MTL106 MTL107 MTL122 MTL180 MTP290 MTL342 MTL783 MTL390	Introduction to Engineering Visualization Product Realization through Manufacturing Total Credits Ime-Linked Basic/Engineering Arts/Scient Data Structures and Algorithms Digital Electronics Principles of Electronic Materials Total Credits ies and Social Sciences from Humanities, Social Sciences and Management of the scategory ental Core Computer Architecture Design and System Laboratory Differential Equations Optimization Methods and Applications Linear Algebra and Applications Algebra Probability and Stochastic Processes Numerical Methods and Computations Real and Complex Analysis Discrete Mathematical Structures Computing Laboratory Analysis and Design of Algorithms Theory of Computation Statistical Methods	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	O 4 4 Correlation O 0 4 O 3 O O O O O O O O O O O O O O O O O	2 2 19 5 4.5 3 12.5 15 3 3 4 4 4 2 4 3 4	COL728 ELL715 ELL786 ELL792 ELL793 ELL884 MTL704 MTL717 MTL720 MTL725 MTL728 MTL728 MTL730 MTL731 MTL731 MTL732 MTL733 MTL734 MTL735 MTL734 MTL735 MTL736 MTL736 MTL737 MTL737 MTL741 MTL742 MTL742 MTL743 MTL744 MTL745 MTL747	Compiler Design Digital Image Processing Multimedia Systems Intelligent Systems Computer Graphics Computer Vision Deep Learning for Natural Language Processing Numerical Optimization Fuzzy Sets and Applications Neurocomputing and Applications Stochastic Processes and its Applications Category Theory Computational Algebra and its Applications Cryptography Introduction to Chaotic Dynamical Systems Financial Mathematics Stochastic of Finance Introductory Actuarial Mathematics Advanced Number Theory Analytic Number Theory Commutative Algebra Representation of Finite Groups Fractal Geometry Operator Theory Fourier Analysis Mathematical Theory of Coding Advanced Matrix Theory Mathematical Logic Symbolic Dynamics	333333333333333333333333333333333333333	$\begin{smallmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 $	$2 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ $	4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
Program COL106 ELL201 PYL102 Humanit Courses offered u Departm ELL305 ELP305 MTL102 MTL103 MTL104 MTL105 MTL106 MTL107 MTL122 MTL180 MTP290 MTL342 MTL783 MTL390 MTL411	Introduction to Engineering Visualization Product Realization through Manufacturing Total Credits Ime-Linked Basic/Engineering Arts/Scient Data Structures and Algorithms Digital Electronics Principles of Electronic Materials Total Credits ies and Social Sciences from Humanities, Social Sciences and Management of the scategory ental Core Computer Architecture Design and System Laboratory Differential Equations Optimization Methods and Applications Linear Algebra and Applications Algebra Probability and Stochastic Processes Numerical Methods and Computations Real and Complex Analysis Discrete Mathematical Structures Computing Laboratory Analysis and Design of Algorithms Theory of Computation Statistical Methods Functional Analysis	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	O 4 4 Corr O 4 4 O 3 O O O O O O O O O O O O O O O	2 2 19 5 4.5 3 12.5 3 1.5 3 3 4 4 4 2 4 3 4 3	COL728 ELL715 ELL786 ELL792 ELL793 ELL884 MTL704 MTL717 MTL720 MTL725 MTL728 MTL728 MTL730 MTL731 MTL731 MTL732 MTL733 MTL734 MTL735 MTL734 MTL735 MTL736 MTL736 MTL737 MTL737 MTL741 MTL742 MTL741 MTL742 MTL743 MTL744 MTL745 MTL745 MTL747	Compiler Design Digital Image Processing Multimedia Systems Intelligent Systems Computer Graphics Computer Vision Deep Learning for Natural Language Processing Numerical Optimization Fuzzy Sets and Applications Neurocomputing and Applications Stochastic Processes and its Applications Category Theory Computational Algebra and its Applications Cryptography Introduction to Chaotic Dynamical Systems Financial Mathematics Stochastic of Finance Introductory Actuarial Mathematics Advanced Number Theory Analytic Number Theory Commutative Algebra Representation of Finite Groups Fractal Geometry Operator Theory Fourier Analysis Mathematical Theory of Coding Advanced Matrix Theory Mathematical Logic Symbolic Dynamics Principles of Computer Graphics	333333333333333333333333333333333333333	$\begin{smallmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 $	$2 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ $	4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
Program COL106 ELL201 PYL102 Humanit Courses offered u Departm ELL305 ELP305 MTL102 MTL103 MTL104 MTL105 MTL106 MTL107 MTL122 MTL180 MTP290 MTL342 MTL783 MTL390 MTL411	Introduction to Engineering Visualization Product Realization through Manufacturing Total Credits Ime-Linked Basic/Engineering Arts/Scient Data Structures and Algorithms Digital Electronics Principles of Electronic Materials Total Credits ies and Social Sciences from Humanities, Social Sciences and Management of the scategory ental Core Computer Architecture Design and System Laboratory Differential Equations Optimization Methods and Applications Linear Algebra and Applications Algebra Probability and Stochastic Processes Numerical Methods and Computations Real and Complex Analysis Discrete Mathematical Structures Computing Laboratory Analysis and Design of Algorithms Theory of Computation Statistical Methods	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	O 4 4 Corr O 4 4 O 3 O O O O O O O O O O O O O O O	2 2 19 5 4.5 3 12.5 15 3 3 4 4 4 2 4 3 4	COL728 ELL715 ELL786 ELL789 ELL792 ELL793 ELL884 MTL704 MTL717 MTL720 MTL725 MTL728 MTL728 MTL730 MTL731 MTL731 MTL732 MTL733 MTL734 MTL735 MTL734 MTL735 MTL736 MTL736 MTL737 MTL741 MTL742 MTL743 MTL744 MTL745 MTL745 MTL745 MTL745 MTL755	Compiler Design Digital Image Processing Multimedia Systems Intelligent Systems Computer Graphics Computer Vision Deep Learning for Natural Language Processing Numerical Optimization Fuzzy Sets and Applications Neurocomputing and Applications Stochastic Processes and its Applications Category Theory Computational Algebra and its Applications Cryptography Introduction to Chaotic Dynamical Systems Financial Mathematics Stochastic of Finance Introductory Actuarial Mathematics Advanced Number Theory Analytic Number Theory Commutative Algebra Representation of Finite Groups Fractal Geometry Operator Theory Fourier Analysis Mathematical Theory of Coding Advanced Matrix Theory Mathematical Logic Symbolic Dynamics	333333333333333333333333333333333333333	$\begin{smallmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 $	$2 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ $	4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3

MTL760	Advanced Algorithms	3	0	0	3	MTV791	Special Module in Dynamical System	1	0	0	1
MTL761	Basic Ergodic Theory	3	0	0	3	MTL811	Mathematical Foundation of Artificial	3	0	0	3
MTL762	Probability Theory	3	0	0	3	3	Intelligence				
MTL776	Graph Algorithms	3	0	0	3	MTL843		-	-	0	-
MTL763	Introduction to Game Theory	3	0	0	3	MTL851	1.1			0	
MTL780	Parameterized Algorithms for NP-hard	3	0	0	3		the first section of the first	-	-	0	-
	Problems					MTL855	3	3	0	0	3
MTL785		3	٥	0	3	1	and Selection				
MTL792				0		M1F860	3	-	-	0	-
WILLIBE		3	U	U	3	IVI I L863	Algebraic Number Theory	-	-	0	-
	Differential equations						Analysis	3	0	0	3
MTL793	Numerical Methods for Hyperbolic PDEs	3	0	0	3	MTL882	Applied Analysis	3	0	0	3
MTL794	Advanced Probability Theory	3	0	0	3	MTL883	Physical Fluid Mechanics	3	0	0	3
MTL795	Numerical Method for Partial	3	1	0	4	MTL888	Boundary Elements Methods with	3	0	0	3
	Differential Equations						Computer Implementation				

	Contact Hours			31.0			24.0				25.0			26.0			21.0			21.0			22.0			18.0			27.0			24.0
	Non-graded Units			2.25			.25				0			0			0			0			0			0			0			0
ľ	Credits			19.0			18.0 1.25 24.0				21.0			21.5			21.0			8.5			20.0			18.0			21.0			12.0
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	Or-asruoJ	NLN100	Language and Writing Skills-1 (Non-graded)	0 0 2 1				Il semester first.																								
)	6-92110J	NEN110	Professional Ethics and Social Responsibility-1 (Non-graded)	0 0 0.5 0.25	NLN101	Language and Writing Skills-2 (Non-graded)	0 0 2 1	the Courses 1-6 of II																								
4	8-azruoJ	NIN100	Introduction to Engineering (Non-graded)	0 0 2 1	NEN111	Professional Ethics and Social Responsibility-2 (Non-graded)	0 0 0.5 0.25	The other half of First year students attend the Courses 1-6 of																								
-	T-92110Ĵ	MCP101	Product Realization through Manufacturing	0 0 4 2				The other half of First																								
	g-əsınoე	PYP100	Physics Laboratory	0 0 4 2					HUL2XX		3 1 0 4	HUL2XX		3 1 0 4	HUL2XX		3 1 0 4	ELP305	Design and System Lab.	0 0 3 1.5	нигзхх		3 0 0 3	PE 4		3 0 0 3	0E 2		3 0 0 3			
	G-esuro	MTL100	Calculus	3 1 0 4	CMP100	Chemistry Laboratory	0 0 4 2	order by half of all f	MTL104	Linear Algebra and Applications	3 0 0 3	MTP290	Computing Laboratory	0 0 4 2	MTL342	Analysis and Design of Algorithms	3 1 0 4	DE 1		3 0 0 3	00 1		3 0 0 3	PE 3		3 0 0 3	PE 6		3 0 0 3			
	6-921100	PYL101	Electromagnetism & Quantum Mechanics	3 1 0 4	MTL101	Linear Algebra and Differential Equations	3 1 0 4	tended in the given	CVL100	Environmental Science	2 0 0 2	SBL100	Introduction to Biology for Engineers	3 0 2 4	MTL107	Numerical Methods and Computation	3 0 0 3	MTL411	Functional Analysis	3 0 0 3	MTL458	Operating Systems	3 0 2 4	PE 2		3 0 0 3	PE 5		3 0 0 3			
	6-92110J	MCP100	Introduction to Engineering Visualization	0 0 4 2	CML101	Introduction to Chemistry	3 1 0 4	Note: Courses 1-6 above are attended in the given order by half of all first year students.	PYL102	Principles of Electronic Materials	3 0 0 3	MTL103	Optimization Methods and Applications	3 0 0 3	MTL105	Algebra	3 0 0 3	MTL390	Statistical Methods	3 1 0 4	DE 2		3 0 0 3	PE 1		3 0 0 3	MTL766	Multivariate Statistical Methods	3 0 0 3			
)	S-92110O	ELP101	Introduction to Electrical Engineering (Lab.)	0 0 2 1	COL100	Introduction to Computer Science	3 0 2 4	Note: Cour	MTL180	Discrete Mathematical Structures	3 1 0 4	ELL201	Digital Electronics	3 0 3 4.5	ELL305	Computer Architecture	3 0 0 3	MTL782	2	3 0 2 4	MTL783	Theory of Computation	3 0 0 3	0E 1		3 0 0 3	MTL781	Finite Elements Theory and Applications	3 0 0 3			_
000	F-92110O	ELL101	Introduction to Electrical Engineering	3 1 0 4	APL100	Engineering Mechanics	3 1 0 4		COL106	Data Structures & Algorithms	3 0 4 5	MTL122	Real and Complex Analysis	3 1 0 4	MTL106	Probability and Stochastic Processes	3 1 0 4	MTL102	<u>e</u>	3 0 0 3	MTL712	Computational Methods for Differential Equations	3 0 2 4	00.2		3 0 0 3	MTD851		0 0 12 6	MTD852		
f	Semester		_			=	-			=			2			>	_	Г	<u> </u>			=			▋			×		Г	×	_

Bachelor of Technology in **Engineering Physics**Department of Physics

Course	rall Credit Structure Category		Cre	iης	its		ental Electives Independent Study	0	3	U)
	Core Courses		5,6	. url		PYL301	Vacuum Technology & Surface Science	3	0		
	ciences (BS)			24			Nuclear Science and Engineering	3	0		
	ring Arts and Science (EAS)			19		PYL303	Materials Science and Engineering	3	0		
	ies and Social Sciences (HuSS)			15			Superconductivity and Applications	3	0		
rogram	me-linked Courses		14	1.5	,	PYL305	Engineering Applications of Plasmas	3	0		
epartm	ental Courses					PYL306	Microelectronic Devices	3	0		
	ental Core			58	}	PYL307		3	0		
Departm	ental Electives			12	!	PYL311	Elements of Material Processing	3		0	
pen Ca	tegory Courses			10)		Lasers		0		
otal Gra	aded Credit requirement		152	2.5	;		Semiconductor Optoelectronics	3	0		
on Gra	ded Units			11			Fourier Optics and Holography	3	0		
							Low Dimensional Physics	3	0		
stitute	Core : Basic Sciences						Nanoscale Fabrication	3	0		
ML101	Introduction to Chemistry	3	1	0	4		Nanoscale Microscopy	2	0		
MP100	Chemistry Laboratory	0	0	4	2	PYL324	Spectroscopy of Nanomaterials	2	0		
TL100	Calculus	3	1	0	4	PYL331	Applied Quantum Mechanics	3	0		
	Linear Algebra and Differential Equations	3		0			General Theory of Relativity & Cosmology	3	0		
	Electromagnetism & Quantum Mechanics			0		PYL411	Quantum Electronics	3	0	_	_
	Physics Laboratory		0			PYD412	Project-II	0	0	1	1(
BL100	Introductory Biology for Engineers	3	0	2	4		Ultrafast Laser Systems and Applications	3	0	0)
	Total Credits				24		Fiber and Integrated Optics	3	0		
etitute	Core: Engineering Arts and Sciences					PYD414	Project-III	0	0		
	Core: Engineering Arts and Sciences			_		PYL414	Engineering Optics	3	0	0)
	Engineering Mechanics		1			PYV418	Selected Topics in Photonics	2	0	0)
	Introduction to Computer Science		0			PYV419	Special Topics in Photonics	1	0	0)
	Environmental Science			0		PYL421	Functional Nanostructures	3	0	0)
	Introduction to Electrical Engineering			0		PYL422	Spintronics	3	0	0	J
	Introduction to Electrical Engineering (Lab)		0			PYL423	Nanoscale Energy Materials & Devices	3	0	0	J
	Introduction to Engineering Visualization		0				Selected Topics in Nanotechnology	2	0	0	J
ICP101	Product Realization through Manufacturing	U	0	4	2		Special Topics in Nanotechnology	1	0	0	J
	Total Credits				19	PYL431	Relativistic Quantum Mechanics	2	0	0)
roaram	me-Linked Basic/Engineering Arts/Scien	CAS	Co	ro		PYL432	Quantum Electrodynamics	3	0		
						PYL433	Introduction to Gauge Field Theories	2	0		
	Chemical Synthesis of Functional Materials						Particle Accelerators	2	0		
LL201	o a constant of the constant o				4.5		Advanced Computational Physics	2	1		
LL205	Signals and Systems		1 0				Selected Topics in Theoretical Physics	2			
SL350	Energy Conservation and Management	3	U	U			Special Topics in Theoretical Physics	1	0		
	Total Credits				14.5	PYL701	Physical Foundations of Materials Science	3	0		
umanit	ies and Social Sciences							3	0		
			4				Physics of Semiconductor Devices	3	0		
	from Humanities, Social Sciences and Mana	gem	ient		45	PYL707	Characterization Techniques for Materials				
nerea ui	nder this category				15	PYL711	Introduction to Nonlinear Dynamics		1		
epartm	ental Core					PYL723	Vacuum Science and Cryogenics		0		
YP111	Engineering Physics Laboratory-I	0	0	6	3	PYL726	Semiconductor Device Technology	3	0		
YL121	Mathematical Physics-I	3		0		PYL730	Plasma Theory and Simulations	3	0		
	Quantum Mechanics			0		PYL740	,	3	0		
	Optics and Photonics-I	3		0		PYL741		3	0		
	Solid State Physics-I	3		0			General Relativity	3	0		
	Classical Mechanics & Relativity	3		0		PYL743	. ,	3	0		
	Statistical Physics	3		0		PYL744	High Energy Physics	3	0	0)
YL204	•	3		0		PYL745	Advanced Statistical Mechanics	3	0	0)
YL204	Electrodynamics	3		0		PYL746	Non-equilibrium Statistical Mechanics	3	0	0	J
YL205	Mathematical Physics-II	3		0		PYL748	Quantum Optics	3	0		
/L208		3		0		PYL749	Quantum Information and Computation	3	0		
YL200	Optics and Photonics-II			0		PYL750	Topology in Condensed Matter Physics	3	0		
	Engineering Physics Laboratory-II		0			PYL753	Optical Systems Design	3	0		
	Engineering Physics Laboratory-II Engineering Physics Laboratory-III	0		6		PYL756		3	0		
			0			PYL759	Fourier optics and holography Computational optical imaging				
				U		F1L/59	COMPUTATIONAL ODUCAL IMADING	3	0	U	J
YP224								0			
YP224 YD411			0			PYL760 PYL800	Biomedical optics and Bio-photonics Numerical and Computational Methods	3	0	0	0

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Contact Hours			31.0			24.0				26.0			26.0			24.0			26.0			19.0			13.0
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Credits			19.0			18.0				23.0			21.5			21.0			22.0			15.0			13.0
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Course-10	NLN100	Language and Writing Skills-1 (Non-graded)	0 0 2				1-6 of II semes																		
6-92110J	NEN110	Professional Ethics and Social Responsibility-1 (Non-graded)	0 0 0.5 0.25	NLN101	Language and Writing Skills-2 (Non-graded)	0 0 2 1	The other half of First year students attend the Courses 1-6 of II semester first																		
8-921 1 00	NIN100	Introduction to Engineering (Non-graded)	0 0 2 1	NEN111	Professional Ethics and Social Responsibility-2 (Non-graded)	0 0 0.5 0.25	First year students																	<u> </u>	
Course-7	MCP101	Product Realization through Manufacturing	0 0 4 2				The other half of																		
g-esinoJ	PYP100	Physics Laboratory	0 0 4 2				If of all first year students.	PYP111	Engineering Physics Laboratory-I	0 0 6 3	PYP212	Engineering Physics Laboratory-II	0 0 6 3	PYP223	Engineering Physics Laboratory-III	0 0 6 3	PYP224	Engineering Physics Laboratory-IV	0 0 6 3						
Course-5	MTL100	Calculus	3 1 0 4	CMP100	Chemistry Laboratory	0 0 4 2	er by half of all fin	HUL2XX		3 1 0 4	ESL350	Energy Conservation and Management	3 0 0 3	CML102	Chemical Synthesis of Functional Materials	3 0 0 3	SBL100	Introductory Biology for Engineers	3 0 2 4	CVL100	Environmental Science	2 0 0 2			
Course-4	PYL101	Electromagnetism & Quantum Mechanics	3 1 0 4	MTL101	Linear Algebra and Differential Equations	3 1 0 4	d in the given orde	PYL125	Solid State Physics-I	3 1 0 4	ELL201	Digital Electronics	3 0 3 4.5	HUL2XX		3 1 0 4	HUL2XX		3 1 0 4	PYD411	Project-I	0 0 8 4	00 3		3 0 0 3
Course-3	MCP100	Introduction to Engineering Visualization	0 0 4 2	CML101	Introduction to Chemistry	3 1 0 4	above are attende	PYL123	Optics & Photonics-I	3 1 0 4	PYL206	Mathematical Physics-II	3 1 0 4	ELL205	Signals and Systems	3 1 0 4	DE 1		3 0 0 3	HUL3XX		3 0 0 3	0C 2		3 1 0 4
S-981100	ELP101		0 0 2 1	COL100	Introduction to Computer Science	3 0 2 4	Note: Courses 1-6 above are attended in the given order by ha	PYL121	Mathematical Physics-I	3 1 0 4	PYL208	Solid State Physics-II	3 0 0 3	PYL205	Electrodynamics	3 1 0 4	PYL204	Computational Physics	3 1 0 4	0C 1		3 0 0 3	DE 4		3 0 0 3
f-921u0J	ELL101	Introduction to Electrical Introduction to Electrical Engineering Engineering (Lab.)	3 1 0 4	APL100	Engineering Mechanics	3 1 0 4		PYL127	Classical Mechanics & Relativity	3 1 0 4	PYL122	Quantum Mechanics	3 1 0 4	PYL209	Optics & Photonics-II	3 0 0 3	PYL202	Statistical Physics	3 1 0 4	DE 2		3 0 0 3	DE 3		3 0 0 3
Semester			_		=	_		Г	=			2			>			5	_		=		Γ	=	

Bachelor of Technology in **Textile Technology** Department of Textile and Fibre Engineering

The overall Credit Structure						TXL232	Fabric Manufacture-II	3	0	0	3
Course Category		(red	ite		TXP232	Fabric Manufacture Laboratory-II	0	0	2	1
Institute Core Courses		•	, cu				Technology of Textile	3	0	0	3
Basic Sciences (BS)			24	Ļ			Preparation & Finishing				
Engineering Arts and Science (EAS)			19			TXP241	Technology of Textile Preparation &	0	0	3	1.5
Humanities and Social Sciences (HuS	(S)		15	,			Finishing Lab				
Programme-linked Courses	,		12)		TXL242	•	3	0	0	3
Departmental Courses						TXP242	Technology of Textile Coloration Lab	0	0	3	1.5
Departmental Core			52	2		TXL361		3	0	0	3
Departmental Electives			16	6		TXP361	Evaluation of Textiles Lab	0	0	2	
Open Category Courses			10)		TXL371	Theory of Textile Structures	3	1	0	
Total Graded Credit requirement			148			TXL372	,	2	0		
Non Graded Units			11			TXD401	. ,	0	0	8	
Institute Core : Basic Sciences							Total Credits				52
CML101 Introduction to Chemistry			10 04	4		Departm	ental Electives				
CMP100 Chemistry Laboratory							Mini Project	0	0	6	2
MTL100 Calculus				4		TXR301		0	1	2	
MTL101 Linear Algebra and Different PYL101 Electromagnetism & Quantu			10				Professional Practices Independent Studies	0	3		3
			04			TXL321	·	3	0	0	
PYP100 Physics Laboratory SBL100 Introductory Biology for Engi			04			TXL321	3 1 3	3	0	0	3
	lileeis	5	0 2				Costing and its Application in Textiles	3	1	0	-
Total Credits				ž	24		Applied Statistics for Textile Engineers	3	0		
Institute Core: Engineering Arts and	Sciences						Major Project Part-II	0	0	16	
APL100 Engineering Mechanics		3	1 0	4	_	TXL700			0	2	
COL100 Introduction to Computer Sc			02			TXL700		3	0	0	
CVL100 Environmental Science			0 0			TXL710	, ,	3	0	0	
ELL101 Introduction to Electrical Eng				4		TXL713	Textured Yarn Technology	3	0	0	
ELP101 Introduction to Electrical Eng			0 2			TXL724	37	3	0		
MCP100 Introduction to Engineering			04			TXL740	Science & App. of Nanotechnology in Textiles		0	0	
MCP101 Product Realization through			0 4			TXL740		3	0	0	
<u> </u>	Manadadaning	•	0 1			IALITI	Allied Industries	J	U	U	5
Total Credits					19	TXL750		3	0	0	3
Programme-Linked Basic/Engineer	ing Arts/Scienc	es (Core)		TXL752		3	0	0	
MLL100 Introduction to Materials Science			0 2		L	TXL766	Design and Manuf. of Textile Structural	3	0		
and Engineering	CHOC		0 2	7	•	17(2700	Composites	Ū	Ū	Ŭ	Ü
APL103 Experimental Methods		3	0 2	Δ	ı	TXL773	Medical Textiles	3	0	0	3
APL 105 Mechanics of Solids and Flu			10			TXL774			0	0	
Total Credits		•			12		Technical Textiles	3	0	0	
Total Credits					12		Design & Manuf. of Text. Reinforced Composites		0	0	
Humanities and Social Sciences						TXL777		3	0	0	3
Courses from Humanities, Social Scien	nces and Manage	-me	nt			TXL780	Principles of Characterization of	3			
offered under this category	1000 and manage		,,,,,	1	15		Functional and Technical Textiles				
energe and and eategery				•		TXL781	Project Appraisal and Finance	3	0	0	3
Departmental Core						TXL782	Production and Operations Management in	3	0	0	3
TXL130 Polymer Chemistry		3	0 0	3	3		Textile Industry				
TXL111 Textile Fibres			02			TXL783	Design of Experiments and Statistical Techniques	3	0	0	3
TXL211 Structure and Physical Prop			0 0			TXL785	Heat and Mass Transport in Fibrous Materials	3	0	0	3
TXL212 Manufactured Fibre Technol				3		TXL786	Technology of Textile Coating and Lamination	n 2	0	2	3
TXP212 Manufactured Fibre Technology				1			Process Cont. and Econ. in Manmade Fibre Prod.				1
TXL221 Yarn Manufacture-I			0 0			TXV702	Management of Textile Business	1	0	0	1
TXP221 Yarn Manufacture Laborator				1		TXV703	Special Module in Textile Product Mgmt.	1	0	0	1
TXL222 Yarn Manufacture-II				3		TXV704	Special Module in Yarn Manufacture	1	0	0	1
TXP222 Yarn Manufacture Laborator			0 2			TXV705	Special Module in Fabric Manufacture	1	0	0	1
TXL231 Fabric Manufacture-I	-		0 0				Special Module in Fibre Science	1	0	0	1
TXP231 Fabric Manufacture Laborate			0 2				Special Module in Textile Chemical Processing	1	0	0	1
	-						_				

TT1	Contact Hours			31.0			24.0				23.0			28.0			23.0			20.0			20.0			16.0
1	stinU babsag-noM			2.25			1.25				0			0			0			0			0			0
	Credits			19.0			18.0				20.0			23.5			19.5			18.0			16.0			14.0
	۵			14			9				9			6			7			4			∞			4
				9			12 3	iirst.	_		16 1			18			5			14 2			12 0			12 0
				-				ster 1	Н		Γ															$\overline{\Box}$
	Ot-asmoo	NLN100	Language and Writing Skills-1 (Non-graded)	0 0 2				1-6 of II seme																		
	6-9synoo	NEN110	Professional Ethics and Social Responsibility-1 (Non-graded)	0 0 0.5 0.5	NLN101	Language and Writing Skills-2 (Non-graded)	0 0 2 1	The other half of First year students attend the Courses 1-6 of II semester first				APL105	Mechanics of Solids and Fluids	3 1 0 4												
	8-asruoJ	NIN100	Introduction to Engineering (Non-graded)	0 0 2 1	NEN111	Professional Ethics and Social Responsibility-2 (Non-graded)	0 0 0.5 0.5	First year students				TXP241	Technology for Textile Prep. and Finishing Lab	0 0 3 1.5	TXP242	Technology of Textile Coloration Lab	0 0 3 1.5									
	7-ashuoJ	MCP101	Product Realization through Manufacturing	0 0 4 2				The other half of I				TXP221	Yarn Manufacture Laboratory–I	0 0 2 1	TXP232	Fabric Manufacture Laboratory–II	0 0 2 1	TXP361	Evaluation of Textiles Lab	0 0 2 1						
	g-əsino)	PYP100	Physics Laboratory	0 0 4 2				alf of all first year students.	HUL2XX		3 1 0 4	TXP231	Fabric Manufacture Laboratory–l	0 0 2 1	TXP222	Yarn Manufacture Laboratory–II	0 0 2 1	TXP212	Manufactured Fibre Technology Lab	0 0 2 1						
	G-esiuoJ	MTL100	Calculus	3 1 0 4	CMP100	Chemistry Laboratory	0 0 4 2	er by half of all fir	CVL100	Environmental Science	2 0 0 2	TXL221	Yarn Manufacture⊣	3 0 0 3	HUL2XX		3 1 0 4	HUL2XX		3 1 0 4	DE 2 (3)		3 0 0 3			
	6-esiuoJ	PYL101	Electromagnetism & Quantum Mechanics	3 1 0 4	MTL101	Linear Algebra and Differential Equations	3 1 0 4	d in the given ord	APL103	Experimental Methods	3 0 2 4	SBL100	Introductory Biology for Engineers	3 0 2 4	TXL212	Manufactured Fibre Technology	3 0 0 3	DE 1 (3)		3 0 0 3	HUL3XX		3 0 0 3	OC 3 (4)		3 0 2 4
chnology	6-esiuoJ	MCP100	Introduction to Engineering Visualization	0 0 4 2	CML101	Introduction to Chemistry	3 1 0 4	above are attende	TXL130	Polymer Chemistry	3 0 0 3	TXL241	Technology of Textile Preparation & Finishing	3 0 0 3	TXL242	Technology of Textile Coloration	3 0 0 3	TXL372	Speciality Yarns and Fabrics	2 0 0 2	TXD411	B.Tech. Project	0 0 8 4	0C 2(3)		3 0 0 3
B.Tech. in Textile Technology	Course-2	ELP101	Introduction to Electrical Engineering (Lab.)	0 0 2 1	COL100	Introduction to Computer Science	3 0 2 4	Note: Courses 1-6 above are attended in the given order by h	TXL111	Textile Fibres	2 0 2 3	TXL231	Fabric Manufacture-I	3 0 0 3	TXL232	Fabric Manufacture—II	3 0 0 3	TXL371	Theory of Textile Structures	3 1 0 4	DE 4 (3)		3 0 0 3	00 1 (3)		3 0 0 3
rech. in	F-921100	ELL101	Introduction to Electrical Engineering	3 1 0 4	APL100	Engineering Mechanics	3 1 0 4		MLL100	Introduction to Materials Science and Engineering	3 0 2 4	TXL211	Structure and Physical Properties of Fibres	3 0 0 3	TXL222	Yarn Manufacture-II	3 0 0 3	TXL361	Evaluation of Textile Materials	3 0 0 3	DE 3 (3)		3 0 0 3	DE 5 (4)		3 0 2 4
B.	Semester		_			=				=		L	2			>			5			=			=	

3. CAPABILITY-LINKED OPTIONS FOR UNDERGRADUATE STUDENTS

As described in Common Rules, Section 1.8, students can make use of additional credits in two blocks of 20 credits to opt for

(a) Minor/Interdisciplinary Area Specialization

(b) Departmental Specialization

A student based on his/her performance and interest can choose either one on both. Successful completion of minor area credits and/or Interdisciplinary/Departmental Specialization will be indicated on the degree.

When a student opts for such a specialization and/or a minor area, he/she can use 10 open category (OC) credits (mandatory degree requirement) towards the specialization and/or minor area requirements. For example, a student registered for B.Tech (Chemical Engg.) and opting for minor area in Computer Science, can opt for courses prescribed for the minor area, as part of mandatory 10 credits requirements under OC. He/she will need to do additional 10 credits for completing the Minor area requirements.

A set of pre-defined courses of total 20 credits in a focus area comprises a Departmental Specialization if the courses belong to the parent Department of an undergraduate programme, or a Minor/Interdisciplinary Area Specialization if the courses belong to a different Department/Centre/School. Additional conditions and details are given in this section.

If any course of a Minor/Interdisciplinary area overlaps with any core course (DC or PC category courses) or elective course (DE or PE category courses) of the student's programme, then credits from this course will not count towards the minor area credit requirements, though this course may contribute towards satisfying the requirement of the Minor/Interdisciplinary area. In such a case, the requirement of 20 credits must be completed by taking other courses of the Minor Area or Departmental/Interdisciplinary specialization. A student interested in opting for a Capability-linked option can register for the same online, on a first-come first served basis, after he/she completes at least 2 courses, preferably the core courses (wherever applicable) of the Minor Area/Interdisciplinary/Departmental Specialization being applied for.

The maximum number of credits per semester may be relaxed upto 28 by Dean, Acaemics for those students who apply for capability-linked option through proper channel.

Minor Area in Atmospheric Sciences (Centre for Atmospheric Sciences)

Minor Area Core										
ASL320	Climate Change: Impacts, Adaptation and Mitigation	3	0	2	4					
ASL340	Fundamentals of Weather and Climate	3	0	0	3					
ASL350	Introduction to Oceanography	3	0	0	3					
ASL360	The Earth's Atmosphere: Physical Principles	3	0	0	3					
ASL370	Indian Monsoon, Global Warming and	3	0	0	3					
401000	Climate Change	_	_	_	_					
ASL380	Climate Modelling	3	0	U	3					
	Total Credits				6					

	Minor	Area	Electi	ves
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Climate of the Past: Lessons for the Future	3	0	0	3
Fundamentals of Air Pollution Science	3	0	0	3
Minor Area Project	0	0	10	5
Physics of the Atmosphere	3	0	0	3
Dynamics of the Atmosphere	3	0	0	3
Atmospheric Chemistry and Air Pollution	3	0	0	3
Science of Climate Change	3	0	0	3
Physical and Dynamical Oceanography	3	0	0	3
Boundary Layer Meteorology	3	0	0	3
Dispersion of Air Pollutants	3	0	0	3
Mesoscale Meteorology	3	0	0	3
Atmospheric Aerosols	3	0	0	3
Cloud Physics	3	0	0	3
Remote Sensing of the Atmosphere and Ocean	3	0	0	3
Synoptic Meteorology	3	0	0	3
Tropical Weather and Climate	3	0	0	3
General Circulation of the Atmosphere	3	0	0	3
Land-Atmosphere Interactions	3	0	0	3
Renewable Energy Meteorology	3	0	0	3
Earth System Modelling	3	0	0	3
Air-Sea Interaction	3	0	0	3
Coastal Ocean and Estuarine Processes	3	0	0	3
Impacts of Climate Change and Air	3	0	0	3
Pollution on Human Health				
	Fundamentals of Air Pollution Science Minor Area Project Physics of the Atmosphere Dynamics of the Atmosphere Atmospheric Chemistry and Air Pollution Science of Climate Change Physical and Dynamical Oceanography Boundary Layer Meteorology Dispersion of Air Pollutants Mesoscale Meteorology Atmospheric Aerosols Cloud Physics Remote Sensing of the Atmosphere and Ocean Synoptic Meteorology Tropical Weather and Climate General Circulation of the Atmosphere Land-Atmosphere Interactions Renewable Energy Meteorology Earth System Modelling Air-Sea Interaction Coastal Ocean and Estuarine Processes Impacts of Climate Change and Air	Fundamentals of Air Pollution Science 3 Minor Area Project 0 Physics of the Atmosphere 3 Dynamics of the Atmosphere 3 Atmospheric Chemistry and Air Pollution 3 Science of Climate Change 3 Physical and Dynamical Oceanography 3 Boundary Layer Meteorology 3 Dispersion of Air Pollutants 3 Mesoscale Meteorology 3 Atmospheric Aerosols 3 Cloud Physics 3 Remote Sensing of the Atmosphere and Ocean 3 Synoptic Meteorology 3 Tropical Weather and Climate 3 General Circulation of the Atmosphere 3 Land-Atmosphere Interactions 3 Renewable Energy Meteorology 3 Earth System Modelling 3 Air-Sea Interaction 5 Coastal Ocean and Estuarine Processes 3 Impacts of Climate Change and Air 3	Fundamentals of Air Pollution Science 3 0 Minor Area Project 0 0 Physics of the Atmosphere 3 0 Dynamics of the Atmosphere 3 0 Atmospheric Chemistry and Air Pollution 3 0 Science of Climate Change 3 0 Physical and Dynamical Oceanography 3 0 Boundary Layer Meteorology 3 0 Dispersion of Air Pollutants 3 0 Mesoscale Meteorology 3 0 Atmospheric Aerosols 3 0 Cloud Physics 3 0 Remote Sensing of the Atmosphere and Ocean 3 0 Synoptic Meteorology 3 0 Tropical Weather and Climate 3 0 General Circulation of the Atmosphere 3 0 Land-Atmosphere Interactions 3 0 Renewable Energy Meteorology 3 0 Earth System Modelling 3 0 Air-Sea Interaction 3 0 Coastal Ocean and Estuarine Processes 3 0 Impacts of Climate Change and Air 3 0	Fundamentals of Air Pollution Science 3 0 0 Minor Area Project 0 0 10 Physics of the Atmosphere 3 0 0 Atmospheric Chemistry and Air Pollution 3 0 0 Science of Climate Change 3 0 0 Physical and Dynamical Oceanography 3 0 0 Boundary Layer Meteorology 3 0 0 Dispersion of Air Pollutants 3 0 0 Mesoscale Meteorology 3 0 0 Atmospheric Aerosols 3 0 0 Cloud Physics 3 0 0 Remote Sensing of the Atmosphere and Ocean 3 0 0 Science of Climate Change 3 0 0 Atmospheric Aerosols 3 0 0 Cloud Physics 3 0 0 Remote Sensing of the Atmosphere and Ocean 3 0 0 Synoptic Meteorology 3 0 0 Tropical Weather and Climate 3 0 0 General Circulation of the Atmosphere 3 0 0 Land-Atmosphere Interactions 3 0 0 Renewable Energy Meteorology 3 0 0 Earth System Modelling 3 0 0 Coastal Ocean and Estuarine Processes 3 0 0 Impacts of Climate Change and Air 3 0 0

ASP766	Atmospheric Measurements and Analysis	1	0	4	3
	Hands-on				
ASV892	An Introduction to Renewable Energy	1	0	0	1
	Meteorology				
ASL822	Climate Variability	3	0	0	3
ASL823	Geophysical Fluid Dynamics	3	0	0	3
	,	-	-	-	_

Minor Area in Biological Sciences (Kusuma School of Biological Sciences)

Minor Area Core

SBL201	High-Dimensional Biology	3	0	0	3	
SBP200	Introduction to Practical Modern Biology	0	0	4	2	
SBL733	Introduction and Techniquies:	3	0	0	3	
	Immunometabolism					

5

Total Credits

Minor Ar						
SBD301	Mini Project	0	0	6	3	
SBL701	Biometry	3	0	0	3	
SBL702	Systems Biology	3	0	0	3	
SBL704	Human Virology	3	0	0	3	
SBL707	Bacterial Pathogenesis	3	0	0	3	
SBL708	Epigenetics in Health and Disease	3	0	0	3	
SBL705	Biology of Proteins	3	0	0	3	
SBL703	Advanced Cell Biology	3	0	0	3	
SBL706	Biologics	3	0	0	3	
SBL709	Marine Bioprospecting	3	0	0	3	
SBL710	Chemical Biology	3	0	0	3	
SBL711	Cell Signalling	3	0	0	3	
SBL712	Dynamics of Infection Biology	3	0	0	3	
SBL713	Introduction to structural Biology	3	0	0	3	
SBL714	Plant Biology and Human Health	3	0	0	3	
SBL720	Genome and Healthcare	3	0	0	3	
SBL721	Techniques in Biomolecular Interactions	3	0	0	3	
SBL722	Stem Cell Biology	3	0	0	3	
SBL723	Principles of Neural Excitability and	3	0	0	3	
	Communication					
SBL724	Decoding Protein Modifications in Biology	3	0	0	3	

SBL726 Endocylosia and Intracellular Trafficing 3 0 0 3 MSL818 Blusiness Process Re-engineering 2 0 0 3 SBL726 Brotogolar Motors Salt 727 Advanced Developmental Blotopy 3 0 0 3 MSL827 Brotogolar Motors Salt 727 Advanced Developmental Blotopy 3 0 0 3 MSL828 Strategic Changes Environment 3 0 0 3 SBL726 Brotogolar Profess In Tumor Blotopy 3 0 0 3 MSL825 Strategic Changes & Resolution Change 3 Resolution of Cell 3 0 0 3 SBL726 Conceptial Transcription and Change 1 SBL726 Conceptial President Management 3 0 0 3 SBL726 Changes In Tumor Blotopy 3 0 0 0 3 SBL726 Changes In Tumor Blotopy 3 0 0 0 3 SBL726 Changes In Tumor Blotopy 3 0 0 0 3 SBL726 Changes In Tumor Blotopy 3 0 0 0 3 SBL726 Changes In Tumor Blotopy 3 0 0 0 3 SBL726 Changes In Tumor Blotopy 3 0 0 0 3 SBL726 Changes In Tumor Blotopy 3 0 0 0 3												
SBL728 Morgan Anna Service Servi	SBL725	,					MSL819	Business Process Re-engineering				
SBL729 Emerging Trends in Tumor Biology 3 0 0 3	SBL726	Biological Motors	30	0	3		MSL820	Global Business Environment	3	0	0	3
SBL729 Emerging Trends in Tumor Biology 3 0 0 3	SBL727	Advanced Developmental Biology	3 0	0	3		MSL821	Strategy Execution Excellence	3	0	0	3
SBL726			3 0	0	3			0,	3	0	n	3
SBL750 Concepts in Three-Dimensional Colluture 3 0 0 3 SBL750 Continuitative Biology of SBL750 Cont		3 3 3 3 3								-	-	-
SBL76 Quantifative Biology 3 0 3 MSL826 Strategies in Functional Management 3 0 0 3 SBL76 Chemical and Molecular Foundation of Cell 3 0 0 3 SBL76 Signal Transduction and Drug Target 3 0 0 3 SBL80 Signal Transduction and Drug Target 3 0 0 3 SBL80 Signal Transduction and Drug Target 3 0 0 3 SBL80 Signal Transduction and Drug Target 3 0 0 3 SBL80 Signal Transduction and Drug Target 3 0 0 3 SBL80 Signal Transduction and Drug Target 3 0 0 3 SBL80 Signal Management and Drug Target 3 0 0 3 SBL80												
SBL75 Chemical and Molecular Foundation of Cell 3 0 3 MSLB20 Marcinocoloural Finance and Drug Target 3 0 0 3 MSLB20 Marcinocoloural Finance and Drug Target 3 0 0 3 MSLB20 Marcinocoloural Finance and Drug Target 3 0 0 3 MSLB20 Marcinocoloural Finance and Drug Target 3 0 0 3 MSLB20 MSL												
SBL802 Signal Transduction and Drug Target 3 0 0 3		0,						•				
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	SBL801	Signal Transduction and Drug Target	3 0	0	3		MSL827	International Competitiveness	3	0	0	3
SBL898 Serbingues in Marmanian Cell Culture 1							MSL828	Global Strategic Management	3	0	0	3
SEW898 Rechniques in Mammalian Celli Culture 3 0 0 3	SBI 802		3 0	٥	3					n	n	3
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Minor Area in Business Management (Department of Management Studies) Minor Area Core (All four courses leading to 12 credits) Minor Area Core (All four courses) leading to 12 credits) Minor Area Core (All four courses) leading to 12 credits) Miscard (Toganizational & People Management 3 o 0 a Miscard (Miscard Management 3 o 0 a Miscard Management All (Miscard Management 3 o 0 a Miscard Management All (Miscard Miscard Management All (Miscard Management All (Miscard Management All (Miscard Miscard Management All (Miscard Miscard Management All (Miscard Miscard Management All (Miscard Miscard Miscard Miscard Management All (Miscard Miscard		•										
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MISL320 Organizational & People Management 3 0 0 3		•	dita						1.5	0	0	1.5
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MSL303 Marketing Management 3 0 0 3	MSL301	Organizational & People Management	3 0	0	3				1.5	0	0	15
MSL303 Marketing Management 3 0 0 3 MSL304 Managing Operations 3 0 0 3 MSL304 MSL304 Supply Chain Modeling 3 0 0 3 MSL303 MSL304 MSL304 Supply Chain Modeling 3 0 0 3 MSL303 MSL304 MSL304 Supply Chain Modeling 3 0 0 3 MSL303 MSL304 MSL304 Supply Chain Modeling 3 0 0 3 MSL303 MSL304 MSL304 MSL304 Supply Chain Modeling 3 0 0 3 MSL304 MSL304 MSL304 Supply Chain Modeling 3 0 0 3 MSL304	MSL302	Managerial Accounting & Financial Management	3 0	0	3							
MSL304 Managing Operations 3 0 0 3 MSL840 Manufacturing Strategy 3 0 0 3 MINCARD Electives (9 credits required)							WOLOGO		•	Ŭ	•	•
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MIDLRO Entrepreneurial Finance				٠								
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MDL804 Behavioral Finance												
MDL8.04 Behavioral Finance 1.5 0 0 1.5 MSL845 Total Project Systems Management 3 0 0 3 MSL340 Financial Institutions and Markets 3 0 0 3 MSL341 Financial Institutions and Markets 3 0 0 3 MSL341 Management 3 0 0 3 MSL341 Sinancial Institutions and Markets 3 0 0 3 MSL341 Management 3 0 0 3 MSL341 Management 3 0 0 3 MSL341 MSL341 Management 3 0 0 3 MSL341	MDL802 I	Entrepreneurial Finance	3	0	0	3	MSL844	Systems Reliability, Safety and	3	0	0	3
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MSL802 Management of Intellectual Property Rights 3 0 0 3 MSL876 Economics of Digital Business 1.5 0 0 1.5 MSL804 Procurement Management 3 0 0 3 MSL877 Electronic Government 1.5 0 0 1.5 MSL805 Services Operations Management 3 0 0 3 MSL878 Electronic Payments 1.5 0 0 1.5 MSL806 Mergers & Acquisitions 3 0 0 0 3 MSL879 Current & Emerging Issues in Finance 3 0 0 3 MSL807 Selected Topics in Strategic Management 1 0 0 1 MSL880 Selected Topics in Management Methodology 3 0 0 3 MSL808 Systems Thinking 3 0 0 3 MSL881 Management of Public Sector Enterprises 3 0 0 3 MSL810 Advanced Data Mining for Business Decisions 1.5 0 0 1.5 MSL811 Management Control Systems 3 0 0 3 MSL812 Flexible Systems Management 3 0 0 3 MSL812 Flexible Systems Management 3 0 0 3 MSL813 Systems Methodology for Management 3 0 0 3 MSL814 Data Visualization 1.5 0 0 1.5 MSL815 Decision Support and Expert Systems 3 0 0 3 MSL816 Total Quality Management 3 0 0 3 MSL881 Data Warehousing for Business Decision 1.5 0 0 1.5 MSL881 Total Quality Management 3 0 0 3 MSL884 Current & Emerging Issues in Public Sector 3 0 0 3 MSL817 Systems Waste & Sustainability 3 0 0 3 MSL888 Current & Emerging Issues in Public Sector 3 0 0 3 MSL881 Data Warehousing for Business Decision 1.5 0 0 1.5 MSL881 Data Warehousing for Business Decision 1.5 0 0 1.5 MSL881 Data Warehousing for Business Decision 1.5 0 0 1.5 MSL881 Data Warehousing Issues in Public Sector 3 0 0 1 1.5 MSL881 Data Warehousing Issues in Public Sector 3 0 0 1 1.5 MSL881 Data Warehousing Issues in Public Sector 3 0 0 1 1.5 MSL881 Data Warehousing Issues in Public Sector 3 0 0 1 1.5 MSL881 Data Warehousing Issues in Public Sector 3 0 0 1 1.5 MSL881 Data Warehousing Issues in Public Sector 3 0 0 1 1.5 MSL881 Data Warehousing Issues in Public Sector 3 0 0 1 1.5 MSL881 Data Warehousing Issues in Public Sector 3 0 0 1 1.5 MSL881 Data Warehousing Issues in Public Sector 3 0 0 1 1.5 MSL881 Data Warehousing Issues in Public Sector 3 0 0 1 1.5 MSL881 Data Warehousing Issues in Public Sector 3 0 0 1 1.5 MSL881 Data Warehous	MSL781	Macroeconomic Dynamics	3	0	0	3	MSL874	Indian Financial System	1.5	0	0	1.5
MSL802 Management of Intellectual Property Rights 3 0 0 0 3 MSL876 Economics of Digital Business 1.5 0 0 1.5 MSL804 Procurement Management 3 0 0 3 MSL877 Electronic Government 1.5 0 0 1.5 MSL805 Services Operations Management 3 0 0 3 MSL878 Electronic Payments 1.5 0 0 1.5 MSL806 Mergers & Acquisitions 3 0 0 0 3 MSL879 Current & Emerging Issues in Finance 3 0 0 3 MSL807 Selected Topics in Strategic Management 1 0 0 1 MSL880 Selected Topics in Management Methodology 3 0 0 3 MSL808 Systems Thinking 3 0 0 3 MSL881 Management of Public Sector Enterprises 3 0 0 3 MSL810 Advanced Data Mining for Business Decisions 1.5 0 0 1.5 MSL811 Management Control Systems 3 0 0 3 MSL812 Flexible Systems Management 3 0 0 3 MSL884 Information System Strategy 3 0 0 3 MSL813 Systems Methodology for Management 3 0 0 3 MSL884 Data Visualization 1.5 0 0 1.5 MSL885 Decision Support and Expert Systems 3 0 0 3 MSL886 Total Quality Management 3 0 0 3 MSL887 Data Warehousing for Business Decision 1.5 0 0 1.5 MSL888 Data Warehousing for Business Decision 1.5 0 0 1.5 MSL881 Total Quality Management 3 0 0 3 MSL888 Data Warehousing for Business Decision 1.5 0 0 1.5 MSL881 Total Quality Management 3 0 0 3 MSL888 Data Warehousing for Business Decision 1.5 0 0 1.5 MSL881 Total Quality Management 3 0 0 3 MSL888 Data Warehousing for Business Decision 1.5 0 0 1.5 MSL881 Total Quality Management 3 0 0 3 MSL888 Data Warehousing for Business Decision 1.5 0 0 1.5 MSL881 Total Quality Management 3 0 0 0 3 MSL888 Data Warehousing for Business Decision 1.5 0 0 1.5 MSL881 Total Quality Management 3 0 0 0 3 MSL888 Data Warehousing for Business Decision 3 0 0 3 MSL881 Systems Waste & Sustainability 3 0 0 3 MSL888 Current & Emerging Issues in Public Sector 3 0 0 3	MSL801	Technology Forecasting & Assessment	3	0	0	3	MSL875	International Financial Management	3	0	0	3
MSL804 Procurement Management 3 0 0 3 MSL877 Electronic Government 1.5 0 0 1.5 MSL805 Services Operations Management 3 0 0 3 MSL878 Electronic Payments 1.5 0 0 1.5 MSL806 Mergers & Acquisitions 3 0 0 3 MSL879 Current & Emerging Issues in Finance 3 0 0 3 MSL807 Selected Topics in Strategic Management 1 0 0 1 MSL880 Selected Topics in Management Methodology 3 0 0 3 MSL808 Systems Thinking 3 0 0 3 MSL881 Management of Public Sector Enterprises 3 0 0 3 MSL809 Cyber Security: Managing Risks 3 0 0 3 MSL881 Management Operations Management Control Systems 3 0 0 3 MSL881 Management Control Systems Management 3 0 0 3 MSL882 Enterprise Cloud Computing 1.5 0 0 1.5 MSL811 Management Control Systems Management 3 0 0 3 MSL883 ICTs, Development and Business 1.5 0 0 1.5 MSL812 Flexible Systems Management 3 0 0 3 MSL884 Information System Strategy 3 0 0 3 MSL813 Systems Methodology for Management 3 0 0 3 MSL885 Digital Marketing-Analytics & Optimization 3 0 0 3 MSL814 Data Visualization 1.5 0 0 1.5 MSL886 IT Consulting & Practice 3 0 0 0 3 MSL815 Decision Support and Expert Systems 3 0 0 3 MSL885 Data Warehousing for Business Decision 1.5 0 0 1.5 MSL816 Total Quality Management 3 0 0 3 MSL888 Current & Emerging Issues in Public Sector 3 0 0 3	MSL802	Management of Intellectual Property Rights	3	0	0	3	MSL876	Economics of Digital Business	1.5	0	0	1.5
MSL805 Services Operations Management 3 0 0 0 3 MSL878 Electronic Payments 1.5 0 0 1.5 MSL806 Mergers & Acquisitions 3 0 0 0 3 MSL879 Current & Emerging Issues in Finance 3 0 0 0 3 MSL807 Selected Topics in Strategic Management 1 0 0 0 1 MSL880 Selected Topics in Management Methodology 3 0 0 3 MSL808 Systems Thinking 3 0 0 3 MSL881 Management of Public Sector Enterprises 3 0 0 0 3 MSL810 Advanced Data Mining for Business Decisions 1.5 0 0 1.5 MSL811 Management Control Systems 3 0 0 0 3 MSL881 Enterprise Cloud Computing 1.5 0 0 1.5 MSL811 Management Control Systems Management 3 0 0 3 MSL883 ICTs, Development and Business 1.5 0 0 1.5 MSL812 Flexible Systems Management 3 0 0 3 MSL884 Information System Strategy 3 0 0 3 MSL813 Systems Methodology for Management 1.5 0 0 1.5 MSL885 Digital Marketing-Analytics & Optimization 3 0 0 3 MSL814 Data Visualization 1.5 0 0 1.5 MSL885 Decision Support and Expert Systems 3 0 0 3 MSL885 Decision Support and Expert Systems 3 0 0 3 MSL885 Data Warehousing for Business Decision 1.5 0 0 1.5 MSL816 Total Quality Management 3 0 0 0 3 MSL888 Data Warehousing for Business Decision 1.5 0 0 1.5 MSL817 Systems Waste & Sustainability 3 0 0 3 MSL888 Current & Emerging Issues in Public Sector 3 0 0 0 3			3			3		<u> </u>				
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MSL812 Flexible Systems Management 3 0 0 3 MSL884 Information System Strategy 3 0 0 3 MSL813 Systems Methodology for Management 3 0 0 3 MSL885 Digital Marketing-Analytics & Optimization 3 0 0 3 MSL814 Data Visualization 1.5 0 0 1.5 MSL886 IT Consulting & Practice 3 0 0 0 3 MSL815 Decision Support and Expert Systems 3 0 0 3 MSL887 Mobile Commerce 3 0 0 0 3 MSL816 Total Quality Management 3 0 0 3 MSL888 Data Warehousing for Business Decision 1.5 0 0 1.5 MSL817 Systems Waste & Sustainability 3 0 0 3 MSL889 Current & Emerging Issues in Public Sector 3 0 0 3	MSL811	Management Control Systems	3	0	0	3	MSL883	ICTs, Development and Business	1.5	0	0	1.5
MSL813 Systems Methodology for Management MSL814 Data Visualization 1.5 0 0 1.5 MSL885 Digital Marketing-Analytics & Optimization 3 0 0 3 MSL885 Digital Marketing-Analytics & Optimization 3 0 0 3 MSL886 IT Consulting & Practice 3 0 0 3 MSL885 Decision Support and Expert Systems 3 0 0 3 MSL887 Mobile Commerce 3 0 0 0 3 MSL881 Data Warehousing for Business Decision 1.5 0 0 1.5 MSL817 Systems Waste & Sustainability 3 0 0 3 MSL889 Current & Emerging Issues in Public Sector 3 0 0 3		•						•				
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MSL818 Industrial waste Management 3 0 0 3 Management							M2F888		3	U	U	3
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MSL891 Data Analytics using SPSS	1.5	0	0	1.5
MSL892 Predictive Analytics	1.5	0	0	1.5
MSL895 Advanced Data Analysis for Management	3	0	0	3
MSL896 International Economic Policy	3	0	0	3
MSL897 Consultancy Process & Skills	3	0	0	3
MSL898 Consultancy Professional Practice	3	0	0	3
MSL899 Current & Emerging Issues in Consultancy	3	0	0	3
Management				
MTL732 Financial Mathematics	4	3	1	0
MSV826 Frontiers in OB & HR Management	1	0	0	1
MSV827 Frontiers in Finance	1	0	0	1
MSV828 Frontiers in Information Systems Mgmt.	1	0	0	1
MSV832 Frontiers in Strategic Management	1	0	0	1
MSV820 Contemporary Issues in IT Management	1	0	0	1
MSV821 Contemporary Issues in Operations Mgmt.	1	0	0	1
MSV816 Contemporary Issue in Management	1	0	0	1
MSV801 Selected Topics in OB & HR Management	1	0	0	1
MSV802 Selected Topics in Finance	1	0	0	1
MSV803 Selected Topics in IT Management	1	0	0	1
MSV804 Selected Topics in Operations Management	1	0	0	1
MSV805 Selected Topics in Economics	1	0	0	1
MSV806 Selected Topics in Marketing Management	1	0	0	1
MSL890 Financial Engineering	3	0	0	3
MSL310 Financial Institutions and Markets	3	0	0	3
MSL718 Management of Blockchain Technology	1.5	0	0	1.5
MSL782 Business Cycles and Global Economy	1.5	0	0	1.5
MSL783 Global Economic Development	1.5	0	0	1.5
MSL784 Sovereign Debt and Default	3	0	0	3

Minor Area in Entrepreneurship (Department of Management Studies)

Minor Area Core: 5 Courses (Total of 12 Credits)

MSL305	New Venture Creation	2	0	2	3	
MSL306	Ideation and Prototyping	2	0	2	3	
MSL307	Venture Financing & Teaming	2	0	2	3	
MSD308	Product Viability & Market Traction	0	0	3	1.5	
MSD309	Business Plan & Funding	0	0	3	1.5	

Minor Area Electives : 3 Courses (Total of 9 Credits) from the following lists

TOHOWING	j iloto					
MSL301	Organization & People Management	3	0	0	3	
MSL302	Managerial Accounting & Financial Management	3	0	0	3	
MSL303	Marketing Management	3	0	0	3	
MSL304	Managing Operations	3	0	0	3	
MSL310	Financial Institutions and Markets	3	0	0	3	
MSL311	Emerging Trends in Finance	3	0	0	3	
MSL401	Entrepreneurial Design Thinking	3	0	0	3	
MSL402	Social Innovation & Entrepreneurship	3	0	0	3	
MSL403	Entrepreneurial Market Strategies	3	0	0	3	
MSL404	Entrepreneurial Business Development	3	0	0	3	
MSL405	Financial Accounting & Compliance for Startups	3	0	0	3	
MSL406	Company Law, Governance, IPR & Legal	3	0	0	3	
	Issues for Startups					
MSL407	Corporate Innovation & Entrepreneurship	3	0	0	3	
MSL408	Startup Performance Management	3	0	0	3	
MSL409	Entrepreneurship and Life Balance	3	0	0	3	
MSL706	Business Law	3	0	0	3	
MSL720	Macroeconomic Environment of Business	3	0	0	3	
MSL721	Econometrics	3	0	0	3	
MSL734	Management of Small & Medium Scale	3	0	0	3	
	Industrial Enterprises					

Minor Area in Economics (Department of Humanities and Social Sciences)

Minor Area Core (Minimum of 8 credits)

HUL211	Introduction to Economics	3	1	0	4	
HUL212	Microeconomics	3	1	0	4	
HUL213	Macroeconomics	3	1	0	4	
HUL217	History of Economic Thought	3	1	0	4	

Minor Area Electives

HUL286	Social Science Approaches to Development	3	1 0	4
HUL311	Applied Game Theory	3	0 0	3
HUL312	Distribution and Growth	3	0 0	3
HUL314	International Economics	3	0 0	3
HUL315	Econometric Methods	3	0 0	3
HUL316	Indian Economic Problems and Policies	3	0 0	3
HUL318	Public Finance and Public Economics	3	0 0	3
HUL319	Comparative Development Paths: Asia and the world	3	0 0	3
HUL320	Selected Topics in Economics	3	0 0	3
HUL372	Agrarian India: Past and Present	3	0 0	3
HSD700	Minor Project	0	0 6	3
HSL711	Macro Development Economics	3	0 0	3
HSL712	Microeconomics	3	0 0	3
HSL713	Macroeconomics	3	0 0	3
HSL714	International Economics	3	0 0	3
HUL715	Time Series Econometrics and Forecasting	3	0 0	3
HSL716	Industrial Economics	3	0 0	3
HSL717	Perspectives on Indian Economy	3	0 0	3
HUL718	Political Economy of Development	3	0 0	3
HSL719	Advanced Econometrics	3	0 0	3
HSL720	Development Economics	3	0 0	3
HUL731	Perspectives on Development	3	0 0	3
HUL735	Research Methods in Economics	1	0 2	2
HUL736	Planning and Economic Development	3	0 0	3
HUL737	Advanced Growth Theory	3	0 0	3
HUL738	International Economics	2	1 0	3
HUL755	Fascism: Philosophical Perspectives	3	0 0	3
HUL756	Time Series Econometrics and Forecasting	3	0 0	3
HUL762	Industrial Economics	3	0 0	3
HSL781	Potential and Perils of the Digital Welfare	3	0 0	3
HSL811	Advanced Economic Growth Theory	3	0 0	3
HSL813	Foundations of Decision Theory	3	0 0	3
HSL814	Research Methods in Economics	1	0 2	2
HSL815	Theory of Market Design	3	0 0	3
	Game Theory Health Economics	3	0 0	3
	Labor Economics	3	0 0	3
		3	0 0	3
113L02U	Advanced Topics in Economics	J	0 0	3

Minor Area in Computational Mechanics (Department of Applied Mechanics)

3 0 2 4

Minor Area Core

APL300 Computational Mechanics

APL705	Finite Element Method	3	0 2	4
Minor Ar	ea Electives			
APD311	Project	0	0 8	4
APL300	Computational Mechanics	3	0 2	4
APL310	Constitutive Modelling	3	0 2	4
APL340	Chaos	3	0 2	4
APL360	Engineering Fluid Flows	3	1 0	4
APL380	Biomechanics	3	0 0	3
APL410	Computational Fluid Dynamics	3	0 2	4
APL440	Parallel Processing in Computational Mechanics	3	0 2	4
APL705	Finite Element Method	3	0 2	4
APL710	Computer Aided Design	3	0 2	4
APL736	Multiscale Modelling of Crystalline Materials	3	0 2	4

Minor Area in Design (Department of Design)

Minor Area Core (10 credits)

	Total Credits				10
DSD799	Design Project	1	0	6	4
DSL751	Form and Aesthetics	2	0	2	3
DSP721	Design and Innovation Methods	1	0	4	3

Minor Area Electives (Minimum of 10 credits)

DSL782 Design for Usability 2 0 2 3

DSR832										
	Design for User Experience	3	0 0) 3	}	COL730	Parallel Programming	3	0	2 4
DSR862	Design in Indian Context	3	0 0) 3	}		Virtualization and Cloud Computing	3	0	2 4
	Strategic Design Management	2					Cloud Computing Technology Fundamentals			2 4
	Design for Sustainability	2					Software Engineering	3		2 4
	Transportation Design	2					Foundations of Automatic Verification	3		2 4
	Special Topics in Design I	3						3		0 3
							Algorithmic Graph Theory			
	Special Topics in Design II) 3			Geometric Algorithms	3	0	
	Special Modules in Design	1					Complexity Theory	3		0 3
	Applied Ergonomics	1					Approximation Algorithms	3		0 3
	Exhibitions and Environmental Design	2					Mathematical Programming	3		0 3
DSR812	Media Studies	2					Model Centric Algorithm Design	3	0	2 4
DSR762	Vehicle Design	2	0 2	2 3	}	COL758	Advanced Algorithms	3	0	2 4
COP315	Embedded System Design Project	1	0 6	3 4	Ļ	COL759	Cryptography & Computer Security	3	0	0 3
MCL749	Mechatronics Product Design	3	0 2	2 4			Advanced Data Management	3	0	2 4
	Product Design and Manufacturing	1	0 4	1 3	3		Data Mining	3		2 4
	Product Design and Development	3					Database Implementation	3		2 4
	Computer Aided Design			2 4			Information Retrieval and Web Search	3		2 4
	Design Engineering			2 4						2 4
	Inclusive Innovation	3					Introduction to Logic and Functional Programming			
							Wireless Networks	3		2 4
	Medical Device Design			2 4			Advanced Artificial Intelligence	3		2 4
	! Minor Biodesign Project	0					Natural Language Processing	3		2 4
	Design Methods	3				COL774	Machine Learning	3		2 4
MCL744	Design for Manufacture and Assembly	3	0 2	2 4		COL776	Learning Probabilistic Graphical Models	3	0	2 4
						COL780	Computer Vision	3	0	2 4
Minor	Area Non Departmental Electives	in	Ma	ate	rial	COL781	Computer Graphics	3	0	3 4.5
Science	e					COL783	Digital Image Analysis	3	0	3 4.5
							Advanced Functional Brain Imaging	3	0	2 4
Wilnor A	rea Electives						Advanced Topics in Embedded Computing	3		0 3
MCL336	Advances in Wedding	3	0	2	4		System Level Design and Modelling	3	0	0 3
MCL769	Metal Forming Analysis	3	0	2	4		Principles of Multiprocessor Systems	3	0	
MCL780	Casting Technology	3	0	2	4		Advanced Distributed Systems	3		2 4
	Welding Science and Technology	3	0	2	4					
	Processing and Mechanics of Composites			2			Processor Design Laboratory	0		8 4
	Polymer Processing	3		0			Reconfigurable Computing	3		0 3
WILLIZO	1 diyilici 1 focessing	J	U	U	J		Advanced Computer Graphics	3		2 4
Minor	Area in Computer Science (Dep	art	me	ant	of		Distributed Computing	3		0 3
		uit		,,,,	OI.		Semantics of Programming Languages	3		0 3
Compi	uter Science and Engineering)					COL832	Proofs and Types	3		0 3
Note : A	student needs to do a minimum of three cours	es o	ut c	of M	linor	COL851	Special Topics in Operating Systems	3	0	0 3
										0 0
Area Co	re and remaining courses from Milhor Area Fie	ectiv	es			COL852	Special Topics in Compilers	3	0	0 3
	re and remaining courses from Minor Area Ele	ectiv	es.					3		
	rea Core	ectiv	es.			COL860	Special Topics in Parallel Computation	3	0	0 3 0 3
Minor A	•	ectiv 3		4	5	COL860 COL861	Special Topics in Parallel Computation Special Topics in Hardware Systems	3	0	0 3 0 3 0 3
Minor A	rea Core	3	0	4 0		COL860 COL861 COL862	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems	3 3	0 0 0	0 3 0 3 0 3 0 3
Minor A COL106 COL202	Data Structures and Algorithms Discrete Mathematical Structures	3	0		4	COL860 COL861 COL862 COL863	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science	3 3 3 3	0 0 0	0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design	3 3 3	0 1 0	0 4	4 5	COL860 COL861 COL862 COL863 COL864	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence	3 3 3 3 3	0 0 0 0	0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture	3 3 3 3	0 1 0	0 4 2	4 5 4	COL860 COL861 COL862 COL863 COL864 COL865	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications	3 3 3 3 3	0 0 0 0 0	0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages	3 3 3 3	0 1 0 0	0 4 2 4	4 5 4 5	COL860 COL861 COL862 COL863 COL864 COL865 COL866	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms	3 3 3 3 3 3	0 0 0 0 0	0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices	3 3 3 3 0	0 1 0 0 0	0 4 2 4 6	4 5 4 5 3	COL860 COL861 COL862 COL863 COL864 COL865 COL866	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks	3 3 3 3 3 3 3	0 0 0 0 0 0	0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems	3 3 3 3 0 3	0 1 0 0 0 0	0 4 2 4 6 4	4 5 4 5 3 5	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL867 COL868	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems	3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0	0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence*	3 3 3 3 0 3 3	0 1 0 0 0 0	0 4 2 4 6 4 2	4 5 4 5 3 5 4	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL867 COL868 COL869	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency	3 3 3 3 3 3 3	0 0 0 0 0 0	0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL334	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks	3 3 3 3 0 3 3 3	0 1 0 0 0 0 0	0 4 2 4 6 4 2 2	4 5 4 5 3 5 4 4	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL867 COL868 COL869	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems	3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0	0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL334 COL351	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms	3 3 3 3 0 3 3	0 1 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0	4 5 4 5 3 5 4 4 4	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL867 COL868 COL869 COL870	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency	3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0	0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL334 COL351	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks	3 3 3 3 0 3 3 3	0 1 0 0 0 0 0 0	0 4 2 4 6 4 2 2	4 5 4 5 3 5 4 4 4	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL867 COL868 COL869 COL870 COL871	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Machine Learning	3 3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0	0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL334 COL351	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms	3 3 3 3 0 3 3 3 3	0 1 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0	4 5 4 5 3 5 4 4 4	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL867 COL868 COL869 COL870 COL871	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Machine Learning Special Topics in Programming Languages Special Topics in Cryptography	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0	0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL334 COL351	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms Introduction to Automata and Theory of	3 3 3 3 0 3 3 3 3 3 3 3	0 1 0 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0	4 5 4 5 3 5 4 4 4 3	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL867 COL868 COL869 COL870 COL871	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Machine Learning Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language	3 3 3 3 3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0	0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL334 COL351 COL352	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms Introduction to Automata and Theory of Computation Introduction to Database Mgmt Systems*	3 3 3 3 0 3 3 3 3 3 3 3	0 1 0 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0 0	4 5 4 5 3 5 4 4 4 3	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL867 COL868 COL870 COL871 COL872 COL873	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Machine Learning Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing	3 3 3 3 3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0 0 0	0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL334 COL351 COL352	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms Introduction to Automata and Theory of Computation Introduction to Database Mgmt Systems* Introduction to Parallel and Distributed	3 3 3 3 0 3 3 3 3 3 3 3	0 1 0 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0 0	4 5 4 5 3 5 4 4 4 3	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL867 COL868 COL870 COL871 COL872 COL873	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Machine Learning Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language	3 3 3 3 3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0 0 0	0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL334 COL351 COL352	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms Introduction to Automata and Theory of Computation Introduction to Database Mgmt Systems* Introduction to Parallel and Distributed Programming	3 3 3 3 0 3 3 3 3 3 3 3	0 1 0 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0 0	4 5 4 5 3 5 4 4 4 3 4 3	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL867 COL869 COL870 COL871 COL872 COL873	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Machine Learning Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0 0 0	0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL334 COL351 COL352	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms Introduction to Automata and Theory of Computation Introduction to Database Mgmt Systems* Introduction to Parallel and Distributed	3 3 3 3 0 3 3 3 3 3 3 3	0 1 0 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0 0	4 5 4 5 3 5 4 4 4 3	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL867 COL869 COL870 COL871 COL872 COL874	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Machine Learning Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0 0 0	0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL334 COL351 COL352 COL362 COL362 COL380	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms Introduction to Automata and Theory of Computation Introduction to Database Mgmt Systems* Introduction to Parallel and Distributed Programming Total Credits (any three above courses)	3 3 3 3 0 3 3 3 3 3 3 3	0 1 0 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0 0	4 5 4 5 3 5 4 4 4 3 4 3	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL867 COL870 COL871 COL872 COL874 COL876 COL876 COL876	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Machine Learning Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3		0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL334 COL351 COL352 COL362 COL362 COL380	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms Introduction to Automata and Theory of Computation Introduction to Database Mgmt Systems* Introduction to Parallel and Distributed Programming Total Credits (any three above courses) rea Electives	3 3 3 3 3 3 3 3 3 3 2	0 1 0 0 0 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0 0	4 5 4 5 3 5 4 4 4 3 4 3 2-15	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL869 COL870 COL871 COL872 COL874 COL874 COL876 COL876 COL878	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Machine Learning Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Minor Project	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 0		0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL334 COL351 COL352 COL362 COL380	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms Introduction to Automata and Theory of Computation Introduction to Database Mgmt Systems* Introduction to Parallel and Distributed Programming Total Credits (any three above courses) Tea Electives Design Project (Non-Graded)	3 3 3 3 3 3 3 3 3 3 3 2	0 1 0 0 0 0 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0 0 2 2 2	4 5 4 5 3 5 4 4 4 3 3 2-15	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL867 COL870 COL871 COL873 COL874 COL874 COL876 COL876 COL878	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Machine Learning Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Minor Project M.Tech. Project Part-I	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 0 0		0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL351 COL352 COL362 COL380 Minor A COD300 COD310	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms Introduction to Automata and Theory of Computation Introduction to Database Mgmt Systems* Introduction to Parallel and Distributed Programming Total Credits (any three above courses) rea Electives Design Project (Non-Graded) Mini Project	3 3 3 3 3 3 3 3 3 3 2	0 1 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0 0 2 2 2 4 6 6 4 2 2 4 6 6 7 1 2 1 2 1 2 2 1 2 2 1 2 1 2 2 1 2 2 1 2 2 1 2	4 5 4 5 3 5 4 4 4 3 3 2-15	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL867 COL870 COL871 COL873 COL874 COL874 COL876 COL876 COL886 COL886 COL8879 COL879 COL879	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Machine Learning Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Minor Project M.Tech. Project Part-I M.Tech. Project Part-II	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 0		0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL351 COL352 COL362 COL380 Minor A COD300 COD310 COP315	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms Introduction to Automata and Theory of Computation Introduction to Database Mgmt Systems* Introduction to Parallel and Distributed Programming Total Credits (any three above courses) rea Electives Design Project (Non-Graded) Mini Project Embedded System Design Project	3 3 3 3 3 3 3 3 3 3 2	0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0 0 2 2 4 6 6 4 2 2 4 6 6 6 6 6 7 1 2 7 1 2 7 1 7 1 7 1 7 1 7 1 7 1 7 1	4 5 4 5 3 5 4 4 4 3 3 2-15	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL869 COL870 COL871 COL874 COL874 COL876 COL878 COL879 COL871	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Machine Learning Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Minor Project M.Tech. Project Part-I M.Tech. Project Part-II Professional Practices (CS)	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 0 0		0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL351 COL352 COL362 COL380 Minor A COD300 COD310 COP315	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms Introduction to Automata and Theory of Computation Introduction to Database Mgmt Systems* Introduction to Parallel and Distributed Programming Total Credits (any three above courses) rea Electives Design Project (Non-Graded) Mini Project	3 3 3 3 3 3 3 3 3 3 3 2	0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0 0 2 2 2 4 6 6 4 2 2 4 6 6 7 1 2 1 2 1 2 2 1 2 2 1 2 1 2 2 1 2 2 1 2 2 1 2	4 5 4 5 3 5 4 4 4 3 3 2-15	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL869 COL870 COL871 COL874 COL874 COL876 COL878 COL879 COL871	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Machine Learning Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Minor Project M.Tech. Project Part-I M.Tech. Project Part-II	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3		0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL354 COL352 COL362 COL380 Minor A COD300 COD310 COP315 COL341	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms Introduction to Automata and Theory of Computation Introduction to Database Mgmt Systems* Introduction to Parallel and Distributed Programming Total Credits (any three above courses) rea Electives Design Project (Non-Graded) Mini Project Embedded System Design Project	3 3 3 3 3 3 3 3 3 3 2	0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0 0 2 2 4 6 6 4 2 2 4 6 6 6 6 6 7 1 2 7 1 2 7 1 7 1 7 1 7 1 7 1 7 1 7 1	4 5 4 5 3 5 4 4 4 3 3 22-15	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL869 COL870 COL871 COL874 COL874 COL876 COL878 COL879 COL871 COL876 COL886 COL874 COL876 COL886 COL886 COL886 COL886 COL886 COL886 COL886 COL886 COL886 COL886 COL886 COL886 COL886 COL886 COL886 COL886 COL871 CO	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Machine Learning Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Minor Project M.Tech. Project Part-I M.Tech. Project Part-II Professional Practices (CS)	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL354 COL352 COL362 COL380 Minor A COD300 COD310 COP315 COL341 COL718	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms Introduction to Automata and Theory of Computation Introduction to Database Mgmt Systems* Introduction to Parallel and Distributed Programming Total Credits (any three above courses) rea Electives Design Project (Non-Graded) Mini Project Embedded System Design Project Machine Learning	3 3 3 3 3 3 3 3 3 3 3 2	0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0 0 2 2 4 6 6 4 2 2 4 6 6 6 6 7 2 7 4 7 4 6 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7	4 5 4 5 3 5 4 4 4 3 3 22-15	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL869 COL870 COL871 COL874 COL874 COL876 COL886 COL886 COL891 COD891 COD891 COS310 COS310 COV877	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Programming Languages Special Topics in Programming Languages Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Minor Project M.Tech. Project Part-I M.Tech. Project Part-II Professional Practices (CS) Independent Study (CS)	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3		0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL351 COL352 COL362 COL380 Minor A COD300 COD310 COP315 COL341 COL718	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms Introduction to Automata and Theory of Computation Introduction to Database Mgmt Systems* Introduction to Parallel and Distributed Programming Total Credits (any three above courses) rea Electives Design Project (Non-Graded) Mini Project Embedded System Design Project Machine Learning Architecture of High Performance Computers Synthesis of Digital Systems	3 3 3 3 3 3 3 3 3 3 3 2	0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0 0 2 2 4 6 6 6 2 2 2 2 2 2 2 2 2 2 2 2 2 2	4 5 4 5 3 5 4 4 4 3 3 4 3 22-15	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL869 COL871 COL874 COL874 COL876 COL886 COL8861 COL879 COL871 COL871 COL871 COL871 COL871 COL871 COL871 COL871 COL876 COL876 COL876 COL886 COD891 COD891 COD893 COR310 COV877 COV878	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Programming Languages Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Minor Project M.Tech. Project Part-I M.Tech. Project Part-II Professional Practices (CS) Independent Study (CS) Special Module on Visual Computing Special Module in Machine Learning	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	000000000000000000000000000000000000000	0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL351 COL352 COL362 COL380 Minor A COD300 COD310 COP315 COL341 COL718 COL719 COL722	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms Introduction to Automata and Theory of Computation Introduction to Database Mgmt Systems* Introduction to Parallel and Distributed Programming Total Credits (any three above courses) rea Electives Design Project (Non-Graded) Mini Project Embedded System Design Project Machine Learning Architecture of High Performance Computers Synthesis of Digital Systems Introduction to Compressed Sensing	3 3 3 3 3 3 3 3 3 3 3 2	0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0 0 2 2 4 6 6 2 2 0 0 1 2 0 1 1 1 1 1 1 1 1 1 1 1 1 1	4 5 4 5 3 5 4 4 4 3 2 2-15	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL869 COL870 COL871 COL874 COL874 COL878 COL878 COL879	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Machine Learning Special Topics in Programming Languages Special Topics in Programming Languages Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Minor Project M.Tech. Project Part-I M.Tech. Project Part-II Professional Practices (CS) Independent Study (CS) Special Module on Visual Computing Special Module in Financial Algorithms	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL352 COL352 COL362 COL380 Minor A COD300 COD310 COP315 COL341 COL718 COL719 COL722 COL724	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms Introduction to Automata and Theory of Computation Introduction to Database Mgmt Systems* Introduction to Parallel and Distributed Programming Total Credits (any three above courses) rea Electives Design Project (Non-Graded) Mini Project Embedded System Design Project Machine Learning Architecture of High Performance Computers Synthesis of Digital Systems Introduction to Compressed Sensing Advanced Computer Networks	3 3 3 3 3 3 3 3 3 3 2	0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0 0 2 2 4 6 6 2 2 2 0 2 0 2 2 0 2 0 2 2 0 2 2 0 2 2 0 2 2 0 2 2 0 2 2 0 2 2 0 2 2 0 2 2 0 2 2 0 2 2 0 2 2 2 2 0 2	4 5 4 5 3 5 4 4 4 3 22-15	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL869 COL870 COL871 COL872 COL874 COL876 COL886 COL886 COL891 COD891 COD891 COD891 COV877 COV878 COV877 COV878 COV879 COV880	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Machine Learning Special Topics in Programming Languages Special Topics in Programming Languages Special Topics in Cryptography Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Minor Project M.Tech. Project Part-I M.Tech. Project Part-II Professional Practices (CS) Independent Study (CS) Special Module on Visual Computing Special Module in Financial Algorithms Special Module in Parallel Computation	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	000000000000000000000000000000000000000	0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL351 COL352 COL362 COL380 Minor A COD300 COD310 COP315 COL341 COL718 COL719 COL722 COL724 COL726	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms Introduction to Automata and Theory of Computation Introduction to Database Mgmt Systems* Introduction to Parallel and Distributed Programming Total Credits (any three above courses) rea Electives Design Project (Non-Graded) Mini Project Embedded System Design Project Machine Learning Architecture of High Performance Computers Synthesis of Digital Systems Introduction to Compressed Sensing Advanced Computer Networks Numerical Algorithms	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0 0 2 2 4 6 6 2 2 2 0 2 2 2 2 2 2 2 2 2 2 2 2 2 2	4 5 4 5 3 5 4 4 4 4 3 3 4 4 4 4 4 4 4 4	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL869 COL870 COL871 COL872 COL873 COL874 COL876 COL886 COD891 COD891 COD891 COS310 COV877 COV878 COV878 COV878 COV8880 COV8881	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Machine Learning Special Topics in Programming Languages Special Topics in Programming Languages Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Minor Project M.Tech. Project Part-I M.Tech. Project Part-II Professional Practices (CS) Independent Study (CS) Special Module on Visual Computing Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Hardware Systems	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	000000000000000000000000000000000000000	0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL351 COL352 COL362 COL380 Minor A COD300 COD310 COP315 COL341 COL718 COL719 COL722 COL724 COL726 COL727	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms Introduction to Automata and Theory of Computation Introduction to Database Mgmt Systems* Introduction to Parallel and Distributed Programming Total Credits (any three above courses) rea Electives Design Project (Non-Graded) Mini Project Embedded System Design Project Machine Learning Architecture of High Performance Computers Synthesis of Digital Systems Introduction to Compressed Sensing Advanced Computer Networks Numerical Algorithms Rapid Mising in Markov Chains	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0 0 2 2 4 6 6 2 2 2 0 2 0 2 0 2 0 2 0 0 2 0 0 2 0	4 5 4 5 3 5 4 4 4 3 4 4 3 2 2-15	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL867 COL870 COL871 COL872 COL873 COL874 COL876 COL886 COD891 COD893 COR310 COS310 COV877 COV878 COV879 COV880 COV881 COV882	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Machine Learning Special Topics in Programming Languages Special Topics in Programming Languages Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Minor Project M.Tech. Project Part-I M.Tech. Project Part-I Professional Practices (CS) Independent Study (CS) Special Module on Visual Computing Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Hardware Systems Special Module in Software Systems	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3		0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL352 COL352 COL362 COL380 Minor A COD300 COD310 COP315 COL341 COL718 COL719 COL722 COL724 COL725 COL727 COL728	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms Introduction to Automata and Theory of Computation Introduction to Database Mgmt Systems* Introduction to Parallel and Distributed Programming Total Credits (any three above courses) rea Electives Design Project (Non-Graded) Mini Project Embedded System Design Project Machine Learning Architecture of High Performance Computers Synthesis of Digital Systems Introduction to Compressed Sensing Advanced Computer Networks Numerical Algorithms Rapid Mising in Markov Chains Compiler Design	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0 0 2 2 4 6 6 2 2 2 0 2 0 2 0 2 0 2 0 2 0 2 0 0 2 0 0 2 0 0 2 0	4 5 4 5 3 5 4 4 4 4 3 4 4 4 3 4 4 4 3 4 4 4 3 4 4 5 5 3 5 5 6 5 6 6 6 6 6 6 6 6 6 6 6 6 6	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL867 COL870 COL871 COL872 COL873 COL874 COL876 COL886 COD891 COD893 COR310 COS310 COV877 COV878 COV878 COV888 COV888 COV888 COV8882 COV888	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Machine Learning Special Topics in Programming Languages Special Topics in Programming Languages Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Minor Project M.Tech. Project Part-I M.Tech. Project Part-I Professional Practices (CS) Independent Study (CS) Special Module on Visual Computing Special Module in Machine Learning Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Hardware Systems Special Module in Theoretical Computer Science	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3		0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor A COL106 COL202 COL215 COL216 COL226 COP290 COL331 COL333 COL352 COL352 COL362 COL380 Minor A COD300 COD310 COP315 COL341 COL718 COL719 COL722 COL724 COL725 COL727 COL728	Data Structures and Algorithms Discrete Mathematical Structures Digital Logic and System Design Computer Architecture Programming Languages Design Practices Operating Systems Principles of Artificial Intelligence* Computer Networks Analysis and Design of Algorithms Introduction to Automata and Theory of Computation Introduction to Database Mgmt Systems* Introduction to Parallel and Distributed Programming Total Credits (any three above courses) rea Electives Design Project (Non-Graded) Mini Project Embedded System Design Project Machine Learning Architecture of High Performance Computers Synthesis of Digital Systems Introduction to Compressed Sensing Advanced Computer Networks Numerical Algorithms Rapid Mising in Markov Chains	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 4 2 4 6 4 2 2 0 0 2 2 4 6 6 2 2 2 0 2 0 2 0 2 0 2 0 2 0 2 0 0 2 0 0 2 0 0 2 0	4 5 4 5 3 5 4 4 4 3 4 4 3 2 2-15	COL860 COL861 COL862 COL863 COL864 COL865 COL866 COL867 COL870 COL871 COL872 COL873 COL874 COL876 COL886 COD891 COD893 COR310 COS310 COV877 COV878 COV878 COV888 COV888 COV888 COV8882 COV888	Special Topics in Parallel Computation Special Topics in Hardware Systems Special Topics in Software Systems Special Topics in Theoretical Computer Science Special Topics in Artificial Intelligence Special Topics in Computer Applications Special Topics in Algorithms Special Topics in High Speed Networks Special Topics in Database Systems Special Topics in Concurrency Special Topics in Machine Learning Special Topics in Programming Languages Special Topics in Programming Languages Special Topics in Natural Language Processing Special Topics in Compilers and Language Implementation Special Topics in Formal Methods Special Topics in Operating Systems Minor Project M.Tech. Project Part-I M.Tech. Project Part-I Professional Practices (CS) Independent Study (CS) Special Module on Visual Computing Special Module in Financial Algorithms Special Module in Parallel Computation Special Module in Hardware Systems Special Module in Software Systems	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3		0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3

	Special Module in Computer Applications Special Module in Algorithms	1	0			Біорпа	rmaceuticals and Fine Chemicals (D			on i tmei
	Special Module in High Speed Networks Special Module in Database Systems	1 1		0		of Che	mical Engineering)	Ċ		
	Special Module in Concurrency	1		0		Minor Ar	ea/Specialization Core			
Minor	Area in Cogeneration and Energy	Ef	fic	اما	1CV	CLD415	Major Project in Biopharmaceuticals and Fine Chemicals	0	0	105
	rtment of Energy Science and Engi				_		Total Credits			5
Minor A	•				,	Minor	on (Consideration Floatives			
	Economics of Energy Conservation	3	0	0	3		rea/Specialization Electives	2	0	0 3
	Cogeneration and Energy Efficiency	3	0	0		CLL296 CLL730	Nano-engineering of Soft Materials Structure, Transport and Reactions in	3		0 3
ESL785	Energy Analysis	3	0	0	3		BioNano Systems	-	Ī	
	Total Credits				9	CLL742	Experimental Characterization of BioMacromolecules	3	0	0 3
Minor A	rea Electives					CLL767		3	0	0 3
ESL714	Power Plant Engineering	3	0	0	3	CLL775	Polymerization Process Modeling	3	0	0 3
	Power Generation, Transmission and Distribution			0		CLL778	Interfacial Behaviour and Transport	3	0	0 3
	Integrated Energy Systems	3	0	0		011.770	of Biomolecules	_	^	0 0
	Waste Heat Recovery	3		0	3	CLL779	Molecular Biotechnology and in-vitro Diagnostics	3	0	0 3
	Industrial Energy and Environmental Analysis Alternative Fuels for Transportation	3	0	0		CLL780	Bioprocessing and Bioseparations	3	0	0 3
	Exergy Analysis	3	0	0		CLL781	Process Operations Scheduling	3	0	0 3
	3, 3, 1					CLL786	Fine Chemicals Technology	3		0 3
Minor	Area in Renewable Energy (Dep	art	me	ent	of	CLL791	Chemical Product and Process Integration	3		0 3
Energy	y Science and Engineering)					CLL792	Chemical Product Development and Commercialization	3	0	0 3
Minor A	rea Electives					CLL793	Membrane Science and Engineering	3	0	0 3
	Energy Laboratories	0	0	6	3	SBL705		3		0 3
	Biomass - A Renewable Resource	3		0						
ESL732	Bioconversion and Processing of Waste	3	0	0	3		Area / Departmental Specialization i			
ESL742	Economics and Financing of Renewable	3	0	0	3	Fluids	and Materials (Department of	CI	1e	mica
E01 755	Energy Systems	2	^	^	2	Engine	ering)			
	Solar Photovoltaic Devices and Systems Wind Energy and Hydro Power Systems	3	0	0		Minor Ar	rea/Specialization Core			
	Solar Energy Utilization	3		0			Major Project in Complex Fluids	0	0	105
	Solar Architecture	3		0		022	Total Credits	·	Ĭ	5
ESL875	Alternative Fuels for Transportation	3	0	0			Total Credits			J
ESL880	Solar Thermal Power Generation	3	0	0	3	Minor Ar	rea/Specialization Electives			
Minor	Area in Technologies for Sustain	ah	ما	D:	ırəl	CLL296	Nano-engineering of Soft Materials	3		0 3
	opment (Centre for Rural Develop					CLL766 CLL767	Interfacial Engineering	3		0 3
Techno		JIII	CII		iiid	CLL767 CLL770	Structures and Properties of Polymers Introduction to Microfluidics & Microfabrication	3	0	0 3
						CLL771	Introduction to Complex Fluids	3		0 3
Minor A	rea Core (Any three of the following course	s)				CLL772	Transport Phenomena in Complex Fluids	3	0	0 3
	Biomass Production	3	0	0		CLL773	Thermodynamics of Complex Fluids	3	0	0 3
	Rural Resources and Livelihoods	3	0	0		CLL774	Simulation Techniques for Complex Fluids	3	0	0 3
	Rural Energy Systems Technologies for Water and Waste Mgmt.	3 2	0	0	3	CLL775 CLL776	Polymerization Process Modeling Granular Materials	3	0	0 3
	Technology Alternatives for Rural Development	3	0	0		CLL777	Complex Fluids Technology	3	0	0 3
RDL760		3	0	0			, and the second of the second	-	-	
INDLIGO	To to L Our elite				9		rea/Departmental Specialization in	End		
NDL700	Total Credits									ering
						Enviro	nment (Department of Chemical En		1e	•
Minor A	rea Electives	3	0	0	3		nment (Department of Chemical En rea/Specialization Core		10	
Minor A		3	0	0	3	Minor Ar	•			105
Minor Ar RDL701 RDL710	Rural Industrialization Policies, Programmes and Cases Rural India and Planning for Development	3		0		Minor Ar	ea/Specialization Core	ıgiı		
Minor Ar RDL701 RDL710 RDL726	Rural Industrialization Policies, Programmes and Cases Rural India and Planning for Development Herbal, Medicinal and Aromatic Plants	3	0	0	3	Minor Ar CLD412	Major Project in Energy and Environment Total Credits	ıgiı		105
Minor Ar RDL701 RDL710 RDL726	Rural Industrialization Policies, Programmes and Cases Rural India and Planning for Development Herbal, Medicinal and Aromatic Plants Technology for Utilization of Wastelands	3	0	0	3	Minor Ar	Major Project in Energy and Environment Total Credits rea/Specialization Electives	0	0	105 5
Minor Ar RDL701 RDL710 RDL726 RDL740	Rural Industrialization Policies, Programmes and Cases Rural India and Planning for Development Herbal, Medicinal and Aromatic Plants Technology for Utilization of Wastelands and Weeds	3 3 3	0 0 0	0 0 0	3 3 3	Minor Ar CLD412 Minor Ar CLL704	Major Project in Energy and Environment Total Credits rea/Specialization Electives Natural Gas Processing	0	0	105 5
Minor Ar RDL701 RDL710 RDL726 RDL740 RDL801	Rural Industrialization Policies, Programmes and Cases Rural India and Planning for Development Herbal, Medicinal and Aromatic Plants Technology for Utilization of Wastelands and Weeds Successful Forms of Grassroot Organizations	3	0	0	3 3 3	Minor Ar CLD412 Minor Ar CLL704 CLL705	Major Project in Energy and Environment Total Credits Pea/Specialization Electives Natural Gas Processing Petroleum Reservoir Engineering	0	0 0 0	105 5 0 3 0 3
Minor Ar RDL701 RDL710 RDL726 RDL740 RDL801 RDL807	Rural Industrialization Policies, Programmes and Cases Rural India and Planning for Development Herbal, Medicinal and Aromatic Plants Technology for Utilization of Wastelands and Weeds	3 3 3	0 0 0	0 0 0	3 3 3	Minor Ar CLD412 Minor Ar CLL704	Major Project in Energy and Environment Total Credits Tea/Specialization Electives Natural Gas Processing Petroleum Reservoir Engineering Petroleum Production Engineering	0	0	105 5
Minor At RDL701 RDL710 RDL726 RDL740 RDL801 RDL807 RDD750 RDP750	Rural Industrialization Policies, Programmes and Cases Rural India and Planning for Development Herbal, Medicinal and Aromatic Plants Technology for Utilization of Wastelands and Weeds Successful Forms of Grassroot Organizations Women, Technology and Development Minor Project Biomass Lab	3 3 3 2 0 0	0 0 0 0	0 0 0 0 2 6 6	3 3 3 3 3 3	Minor Ar CLD412 Minor Ar CLL704 CLL705 CLL706	Major Project in Energy and Environment Total Credits Pea/Specialization Electives Natural Gas Processing Petroleum Reservoir Engineering	0 3 3 3	0 0 0 0	105 5 0 3 0 3 0 3
Minor At RDL701 RDL710 RDL726 RDL740 RDL801 RDL807 RDD750 RDP750 RDL702	Rural Industrialization Policies, Programmes and Cases Rural India and Planning for Development Herbal, Medicinal and Aromatic Plants Technology for Utilization of Wastelands and Weeds Successful Forms of Grassroot Organizations Women, Technology and Development Minor Project Biomass Lab Karigar & Traditional Industries	3 3 3 2 0 0 3	0 0 0 0 0 0	0 0 0 0 2 6 6 2	3 3 3 3 3 3 4	Minor Ar CLD412 Minor Ar CLL704 CLL705 CLL706 CLL720 CLL721 CLL722	Major Project in Energy and Environment Total Credits rea/Specialization Electives Natural Gas Processing Petroleum Reservoir Engineering Petroleum Production Engineering Principles of Electrochemical Engineering Electrochemical Methods Electrochemical Conversion and Storage Devices	0 3 3 3 3 3 3	0 0 0 0 0 0 0	105 5 0 3 0 3 0 3 0 3 0 3 0 3
Minor At RDL701 RDL710 RDL726 RDL740 RDL801 RDL807 RDD750 RDP750 RDL702 RDL725	Rural Industrialization Policies, Programmes and Cases Rural India and Planning for Development Herbal, Medicinal and Aromatic Plants Technology for Utilization of Wastelands and Weeds Successful Forms of Grassroot Organizations Women, Technology and Development Minor Project Biomass Lab Karigar & Traditional Industries Ecological Perspective of Growth & Development	3 3 3 3 2 0 0 3 3	0 0 0 0 0 0 0	0 0 0 0 2 6 6 2 0	3 3 3 3 3 3 4 3	Minor Ar CLD412 Minor Ar CLL704 CLL705 CLL706 CLL720 CLL721 CLL722 CLL723	Major Project in Energy and Environment Total Credits rea/Specialization Electives Natural Gas Processing Petroleum Reservoir Engineering Petroleum Production Engineering Principles of Electrochemical Engineering Electrochemical Methods Electrochemical Conversion and Storage Devices Hydrogen Energy and Fuel Cell Technology	0 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0	105 5 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor At RDL701 RDL710 RDL726 RDL740 RDL801 RDL807 RDD750 RDP750 RDL702 RDL725	Rural Industrialization Policies, Programmes and Cases Rural India and Planning for Development Herbal, Medicinal and Aromatic Plants Technology for Utilization of Wastelands and Weeds Successful Forms of Grassroot Organizations Women, Technology and Development Minor Project Biomass Lab Karigar & Traditional Industries Ecological Perspective of Growth & Development Conservation and Recycling Practice in	3 3 3 2 0 0 3	0 0 0 0 0 0	0 0 0 0 2 6 6 2	3 3 3 3 3 3 4 3	Minor Ar CLD412 Minor Ar CLL704 CLL705 CLL706 CLL720 CLL721 CLL722	Major Project in Energy and Environment Total Credits rea/Specialization Electives Natural Gas Processing Petroleum Reservoir Engineering Petroleum Production Engineering Principles of Electrochemical Engineering Electrochemical Methods Electrochemical Conversion and Storage Devices Hydrogen Energy and Fuel Cell Technology Environmental Engineering and	0 3 3 3 3 3 3	0 0 0 0 0 0 0	105 5 0 3 0 3 0 3 0 3 0 3 0 3
Minor At RDL701 RDL710 RDL726 RDL740 RDL801 RDL807 RDD750 RDP750 RDL702 RDL725	Rural Industrialization Policies, Programmes and Cases Rural India and Planning for Development Herbal, Medicinal and Aromatic Plants Technology for Utilization of Wastelands and Weeds Successful Forms of Grassroot Organizations Women, Technology and Development Minor Project Biomass Lab Karigar & Traditional Industries Ecological Perspective of Growth & Development Conservation and Recycling Practice in Rural Area	3 3 3 2 0 0 3 3 3 3	0 0 0 0 0 0 0	0 0 0 2 6 6 2 0 2	3 3 3 3 3 3 4 3 4	Minor Ar CLD412 Minor Ar CLL704 CLL705 CLL706 CLL720 CLL721 CLL722 CLL723 CLL724	Major Project in Energy and Environment Total Credits Pea/Specialization Electives Natural Gas Processing Petroleum Reservoir Engineering Petroleum Production Engineering Principles of Electrochemical Engineering Electrochemical Methods Electrochemical Conversion and Storage Devices Hydrogen Energy and Fuel Cell Technology Environmental Engineering and Waste Management	0 3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0	105 5 0 3 0 3 0 3 0 3 0 3 0 3 0 3 0 3
Minor Ar RDL701 RDL710 RDL726 RDL740 RDL801 RDL807 RDD750 RDP750 RDL702 RDL702 RDL725 RDL727	Rural Industrialization Policies, Programmes and Cases Rural India and Planning for Development Herbal, Medicinal and Aromatic Plants Technology for Utilization of Wastelands and Weeds Successful Forms of Grassroot Organizations Women, Technology and Development Minor Project Biomass Lab Karigar & Traditional Industries Ecological Perspective of Growth & Development Conservation and Recycling Practice in Rural Area Value Chain in Agro-Food Processing	3 3 3 3 2 0 0 3 3	0 0 0 0 0 0 0 0	0 0 0 2 6 6 2 0 2	3 3 3 3 3 3 4 3 4	Minor Ar CLD412 Minor Ar CLL704 CLL705 CLL706 CLL720 CLL721 CLL722 CLL723	Major Project in Energy and Environment Total Credits rea/Specialization Electives Natural Gas Processing Petroleum Reservoir Engineering Petroleum Production Engineering Principles of Electrochemical Engineering Electrochemical Methods Electrochemical Conversion and Storage Devices Hydrogen Energy and Fuel Cell Technology Environmental Engineering and	0 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0	105 5 0 3 0 3 0 3 0 3 0 3 0 3 0 3

CLL728 CLL729 CLL733 CLL734	Biomass Conversion and Utilization Colloids and Aerosols Industrial Multiphase Reactors Process Intensification and Novel Reactors	3 3 3	0	0 0 0	3	PYV429	Selected Topics in Nanotechnology Special Topics in Nanotechnology Project-III	2 1 0	0	0 0 8	1
CLL735	Design of Multicomponent Separation Processes	3		0		Minor A Techno	Area/Departmental Specialization in blogy (Department of Physics)	Ph	ot	on	ics
CLL736	Experimental Characterization of Multiphase Reactors	3	0	0	3	Minor Ar	ea/Specialization Core				
CLL743	Petrochemicals Technology	3	0	0	3		Quantum Mechanics	3	1	0	
CLL768	Fundamentals of Computational	2	0	2	3	PYL115	Applied Optics Total Credits	3	1	0	4 8
CLL769	Fluid Dynamics Applications of Computational Fluid Dynamics	2	0	2	3						0
	Membrane Science and Engineering	3	0		3		rea/Specialization Electives		_	_	
CLL794	Petroleum Refinery Engineering	3	0	0	3	PYL311	Lasers Semiconductor Optoelectronics	3		0	
Minor	Area/Departmental Specialization	in	Dr	00	000		Fourier Optics and Holography	3		0	
	ering, Modelling and Optimization (I						Quantum Electronics	3	0	0	
_	mical Engineering)	JCF	Jui	CI I	iciic		Ultrafast Laser Systems and Applications	3			
	rea/Specialization Core						Fiber and Integrated Optics Project-III	3	0	0 8	
	Major Project in Process Engineering,	Λ	Λ	1	0.5		Engineering Optics	3		0	
CLD414	Modeling and Optimization	U	U		03		Selected Topics in Photonics	2		0	
	Total Credits				5	PYV419	Special Topics in Photonics	1	0	0	1
Minor A	rea/Specialization Electives					Minor A Techno	Area/Departmental Specialization in Diogies (Department of Physics)	n Q	lua	ınt	um
CLL390	Process Utilities and Pipeline Design	3	0	0	3		rea/Specialization Core				
CLL475	Safety and Hazards in Process Industries	3		0		PYL122	Quantum Mechanics	3	1	0	4
CLL477 CLL707	Materials of Construction	3		0		PYL125	Solid State Physics-I	3	1	0	4
CLL707		3		0		PYL209	OR Optics and Photonics-II	3	0	0	3
CLL734	Process Intensification and Novel Reactors	3	0	0	3	PYL750	Topology in Condensed Matter Physics			0	
CLL735	Design of Multicomponent Separation	3	0	0	3		Total Credits				7/8
CLL736	Processes Experimental Characterization of	3	0	0	3	Minor Ar	ea/Specialization Electives				
CLL760	Multiphase Reactors Crystal Engineering and Design	3	٥	0	3		Applied Quantum Mechanics			0	
CLL761	Chemical Engineering Mathematics	3		0		PYL321 PYL703	Low Dimensional Physics Electronic properties of Materials			0	
CLL762	Advanced Computational Techniques in	2		2		PYL728	• •			0	
CLL768	Chemical Engineering Fundamentals of Computational Fluid Dynamics	2	0	2	3		Spintronics			0	
CLL769	Applications of Computational Fluid Dynamics			2			Advanced Condensed matter theory			0	
CLL781	Process Operations Scheduling	3	0	0	3	PTV4AA	Selected topics in Quantum Materials and Devices		U	0	2
CLL782	Process Optimization Advanced Process Control	3		0		PYV4XX	Special topics in Quantum Mechanics with	1	0	0	1
CLL783	Process Modeling and Simulation	3		0			Applications to Nanotechnology and				
CLL785	<u> </u>	3	0	0	3	PYL411	Information Science Quantum Electronics	3	0	0	3
CLL787		3		0			Engineering Optics			0	
CLL788 CLL789	Process Data Analytics Applied Time Series Analysis for Chemical	3		0		PYL748	Quantum Optics	3	0	0	3
OLLTOO	Engineering	Ü	Ü	Ü	Ü		Quantum information and computation			0	
	Chemical Product and Process Integration			0			Photonic Devices Statistical and Quantum Optics			0	
CLL792	Chemical Product Development and Commercialization	3	0	0	3		Advanced Quantum Optics and Applications			0	
CLL793	Membrane Science and Engineering	3	0	0	3	PYL762	Statistical Optics and Optical Coherence Theory	3		0	
Minor	Area/Departmental Specialization	n i	n	Na	ıno-		Selected topics in Cold Atoms and Quantum Technologies	2	0	0	2
	e and Technology (Department of						Project-III			8	
Minor A	rea/Specialization Core		_			Minor Theor	Area / Departmental Speciali etical and Computational Tech	za	tic au	on es	in
	Quantum Mechanics	3		0		Physic	s (Department of Physics)		-		
PYL201	Fundamentals of Dielectrics & Semiconductors	3	1	0		Minor Ar	rea/Specialization Core				
	Total Credits				8	PYL122	Quantum Mechanics	3	1	0	4
Minor A	rea/Specialization Electives					PYL204	Computational Physics	3	1	0	4
	Low Dimensional Physics	3		0			Total Credits				8
	Nanoscale Fabrication Nanoscale Microscopy	3 2		0		Minor Ar	rea/Specialization Electives				
	Spectroscopy of Nanomaterials	2		0			General Theory of Relativity & Cosmology	3	0	0	3
PYL421		3	0	0	3	PYD414	Project-III	0		8	
PYL422		3		0			Quantum Electrodynamics	3	0	0	
PYL423	Nanoscale Energy Materials & Devices	3	U	0	J	PYL433	Gauge Field Theory	3	U	0	3

PYV435	Monte Carlo and Molecular Dynamics Simulation	2	1	0	3	COL770	Advanced Artificial Intelligence	3	0	2	4
PYL745	Advanced Statistical Mechanics	3	0	0	3	COL780	Computer Vision	3	0	2	4
PYL749	Quantum Information and Computing	3	0	0	3		Digital Image Analysis	3			4.5
PYL739	Computational Techniques for Solid State Materials			0			Virtual and Augmented Reality	3	0	2	
			0								
	Group Theory	3		0		COL864		3	0	0	
	Relativistic Quantum Mechanics	2	0	0	2	COL870	Special Topics in Machine Learning	3	0	0	3
PYV438	Selected Topics in Theoretical and					ELL406	Robotics and Automation	3	0	0	3
	Computational Physics	2	0	0	2	ELL409	Machine Intelligence and Learning	3	0	2	4
PYV439	Special Topics in Theoretical and					ELL703	Optimal Control Theory	3	0	0	3
1 1 7 400	Computational Physics	1	0	Λ	1	ELL715		3	0		
	Computational Physics		U	U	1		Digital Image Processing				
						ELL767	Mechatronics	3	0		
Interdis	sciplinary Specialization in Biodes	iqi	n			ELL787	Embedded Systems and Applications	3	0	0	3
		•				ELL791	Neural Systems and Learning Machines	3	0	2	4
Specializ	zation Core					ELL793	Computer Vision	3	0	0	
BMI 741	Medical Device Design	2	0	4	4				0		
	Minor Biodesign Project	0		8		ELL798	Agent Technology	3	-	0	
DIVID142	Willor Blodesign Froject	U	U	0	4		Analysis and Design of Algorithms	3	1	0	
	Total Credits				8	MTL509	Numerical Analysis	3	1	0	4
						MTL729	Computational Algebra and its Applications	3	0	0	3
Specializ	ration Electives					MTL744		3	0	0	
		_	_	_		MTL811	, ,	3	0	0	
	Biomechanics	3		0		WILCII		3	U	U	3
	Healthcare Engineering	2	0		3		Artificial Intelligence				
BML401	Healthcare Entrepreneurship	2	0	2	3	MTL851	Applied Numerical Analysis	3		0	
	Intro. to Basic Medical Sciences for Engineers	3	0	0	3		Analytical Dynamics	3	0	0	3
	Industrial Biomaterial Technology	3		0			Dynamics of Multibody Systems	2		2	
		3	-	0	-		Robotics	3		2	
	Medical Imaging										
	Biomedical Signal and Image Processing	2	0		3		Mechatronics Product Design	3		2	
BML737	Application of Mathematics in	2	0	0	2	MCL797	Freedom and Constraints in Design	3	0	0	3
	Biomedical Engineering					MCL798	Medical Robotics	2	0	2	3
BMI 7/13	Special Topics in Biodesign	3	0	Λ	3		Advanced Mechanisms	2	Λ	2	3
							Advanced Robotics	2		2	-
	Point of Care Medical Diagnostic Devices	3				WCL043	Advanced Robotics	_	U	_	3
	Fundamentals of Biomechanics	3	0	0							
BML771	Orthopaedic Device Design	2	0	0	2	Depart	mental Specialization in Applica	atio	n	s a	and
BML772	Biofabrication	3	0	0	3		ation Technology (Department of				
	Tissue Engineering	3						C	וווכ	ıpu	itei
	Biomaterials	3		0		Scienc	e and Engineering)				
							<u> </u>				
	Biosensor Technology	3	0		4	Specializ	zation Core				
CLL779	Molecular Biotechnology and in-vitro Diagnostics	3	0	0	3	COD494	B.Tech. Project Part-II	0	Λ	16	3.8
	Thermofluid Analysis of Biosystems	3	0	0	3						
MCL442	Thermofluid Analysis of Biosystems Medical Textiles	3	0				Logic for Computer Science	3		2	4
MCL442	Thermofluid Analysis of Biosystems Medical Textiles				3 3						
MCL442 TXL773	Medical Textiles	3					Logic for Computer Science				4
MCL442 TXL773		3				COL703	Logic for Computer Science Total Credits				4
MCL442 TXL773	Medical Textiles sciplinary Specialization in Roboti	3				COL703	Logic for Computer Science Total Credits zation Electives	3	0	2	4 12
MCL442 TXL773 Interdis	Medical Textiles	3				Specializ COL333	Logic for Computer Science Total Credits zation Electives Principles of Artificial Intelligence*	3	0	2	4 12
MCL442 TXL773 Interdis Specializ Core 1	Medical Textiles sciplinary Specialization in Roboti sation Core	3	0	0	3	Specializ COL333	Logic for Computer Science Total Credits zation Electives	3	0	2	4 12
MCL442 TXL773 Interdis Specializ Core 1	Medical Textiles sciplinary Specialization in Roboti	3	0	0	3	Specializ COL333 COL362	Logic for Computer Science Total Credits zation Electives Principles of Artificial Intelligence*	3	0 0 0	2	4 12 4 4
MCL442 TXL773 Interdis Specializ Core 1 MCL111+	Medical Textiles sciplinary Specialization in Roboti eation Core Kinematics and Dynamics of Machines	3 CS 3	0	2	4	Specializ COL333 COL362	Logic for Computer Science Total Credits zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer	3 3 3	0 0 0	2 2 2	4 12 4 4
MCL442 TXL773 Interdis Specializ Core 1 MCL111 ⁺ MCL212 [#]	Medical Textiles sciplinary Specialization in Roboti cation Core Kinematics and Dynamics of Machines Control Theory and Applications	3 CS 3 3	0 0 0	2 2	4 4	Specializ COL333 COL362 COL707	Logic for Computer Science Total Credits zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science	3 3 3	0 0 0	2 2 2	4 12 4 4 4
MCL442 TXL773 Interdis Specializ Core 1 MCL111* MCL212# ELL225#	Medical Textiles sciplinary Specialization in Roboti cation Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I	3 CS 3 3	0 0 1	2 2 0	4 4 4 4	Specializ COL333 COL362 COL707	Logic for Computer Science Total Credits zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing	3 3 3 3	0 0 0	2 2 2 0	4 12 4 4 4 3
MCL442 TXL773 Interdis Specializ Core 1 MCL111* MCL212# ELL225# COP315*	Medical Textiles sciplinary Specialization in Roboti cation Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project	3 3 3 0	0 0 0 1 1	2 2 0 6	4 4 4 4 4	Specializ COL333 COL362 COL707 COL722 COL757	Logic for Computer Science Total Credits zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design	3 3 3 3	0 0 0 0 0	2 2 2 2 0 2	4 12 4 4 4 4 3 4
MCL442 TXL773 Interdis Specializ Core 1 MCL111* MCL212# ELL225# COP315*	Medical Textiles sciplinary Specialization in Roboti cation Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I	3 CS 3 3	0 0 0 1 1	2 2 0	4 4 4 4 4	Specializ COL333 COL362 COL707 COL722 COL757	Logic for Computer Science Total Credits zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing	3 3 3 3	0 0 0	2 2 2 2 2 2 2	4 12 4 4 4 4 4 4
MCL442 TXL773 Interdis Specializ Core 1 MCL111+ MCL212# ELL225# COP315* ELL365*	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems	3 3 3 0 3	0 0 0 1 1	2 2 0 6	4 4 4 4 4	Specializ COL333 COL362 COL707 COL722 COL757 COL760	Logic for Computer Science Total Credits zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design	3 3 3 3	0 0 0 0 0	2 2 2 2 2 2 2	4 12 4 4 4 4 4 4
MCL442 TXL773 Interdis Specializ Core 1 MCL111+ MCL212# ELL225# COP315* ELL365*	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as co	3 3 3 0 3 ore.	0 0 0 1 1	2 2 0 6	4 4 4 4 4	Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL761	Logic for Computer Science Total Credits zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining	3 3 3 3 3 3	0 0 0 0 0 0 0	2 2 2 2 2 2 2 2	4 12 4 4 4 4 4 4 4
MCL442 TXL773 Interdis Specializ Core 1 MCL111+ MCL212# ELL225# COP315* ELL365* *Students	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as coof CS1/CS5 to take only one of these courses as coof CS1/CS5 to take only one of these courses as coof CS1/CS5 to take only one of these courses as coof CS1/CS5 to take only one of these courses as coof CS1/CS5 to take only one of these courses as coof CS1/CS5 to take only one of these courses as coof CS1/CS5 to take only one of these courses as coof CS1/CS5 to take only one of these courses as coof CS1/CS5 to take only one of these courses as coofficients on the coofficients of the coof	3 3 3 0 3 ore.	0 0 0 1 1	2 2 0 6	4 4 4 4 4	Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL761 COL762	Logic for Computer Science Total Credits zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation	3 3 3 3 3 3 3	0 0 0 0 0 0	2 2 2 2 2 2 2 2 2	4 4 4 4 4 4 4 4 4
MCL442 TXL773 Interdis Specializ Core 1 MCL111+ MCL212# ELL225# COP315* ELL365* *Students	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as co	3 3 3 0 3 ore.	0 0 0 1 1	2 2 0 6	4 4 4 4 4	Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL761 COL762 COL764	Logic for Computer Science Total Credits zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search	3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0	2 2 2 2 2 2 2 2 2 2	4 4 4 4 4 4 4 4 4
MCL442 TXL773 Interdis Specializ Core 1 MCL111* MCL212* ELL225* COP315* ELL365* *Students +Core for I	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as coof CS1/CS5 to take only one of these courses as coof CS1/CS5 to take only one of these courses as coof CS1/CS5 to take only one of these courses as coof CS1/CS5 to take only one of these courses as coof CS1/CS5 to take only one of these courses as coof CS1/CS5 to take only one of these courses as coof CS1/CS5 to take only one of these courses as coof CS1/CS5 to take only one of these courses as coof CS1/CS5 to take only one of these courses as coofficients on the coofficients of the coof	3 3 3 0 3 ore.	0 0 1 1 0	2 2 0 6 0	4 4 4 4 3	Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL761 COL762 COL764	Logic for Computer Science Total Credits zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and	3 3 3 3 3 3 3	0 0 0 0 0 0	2 2 2 2 2 2 2 2 2	4 4 4 4 4 4 4 4 4
MCL442 TXL773 Interdis Specializ Core 1 MCL111* MCL212* ELL225* *COP315* ELL365* *Students +Core for IOther Stu	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as coof CS1/CS5 to take only one of these courses as confectives.	3 3 3 0 3 ore.	0 0 1 1 0	2 2 0 6 0	4 4 4 4 3	Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL761 COL762 COL764 COL765	Logic for Computer Science Total Credits zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming	3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0 0	2 2 2 2 2 2 2 2	4 4 4 4 4 4 4 4 4 4 4
MCL442 TXL773 Interdis Specializ Core 1 MCL111+ MCL212# ELL225# COP315* ELL365* *Students +Core for IOther Stur Core 2	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as co of CS1/CS5 to take only one of these courses as co EE1/EE3 students only. dents can select any one of the Core 1 courses men	3 3 3 0 3 ore.	0 0 1 1 0	2 2 0 6 0	4 4 4 4 3	Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL761 COL762 COL764 COL765	Logic for Computer Science Total Credits zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and	3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0 0	2 2 2 2 2 2 2 2 2 2	4 12 4 4 4 4 4 4 4 4 4 4
MCL442 TXL773 Interdis Specializ Core 1 MCL111* MCL212* ELL225* *COP315* ELL365* *Students +Core for I Other Stu	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as coof CS1/CS5 to take only one of these courses as confectives.	3 3 3 0 3 ore.	0 0 1 1 0	2 2 0 6 0	4 4 4 4 3	Specializ COL703 Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL761 COL762 COL764 COL765 COL770	Logic for Computer Science Total Credits zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming	3 3 3 3 3 3 3 3 3	0 0 0 0 0 0 0 0 0 0	2 2 2 2 2 2 2 2	4 12 4 4 4 4 4 4 4 4 4 4
MCL442 TXL773 Interdis Specializ Core 1 MCL111 ⁺ MCL212 [#] ELL225 [#] COP315 ² ELL365* *Students +Core for to Other Stur Core 2 JRL301	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as co of CS1/CS5 to take only one of these courses as co EE1/EE3 students only. dents can select any one of the Core 1 courses men	3 3 3 0 3 ore.	0 0 1 1 0	2 2 0 6 0	4 4 4 4 3	Specializ COL703 Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL761 COL762 COL764 COL765 COL770 COL786	Logic for Computer Science Total Credits Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming Advanced Artificial Intelligence Advanced Functional Brain Imaging	3 3 3 3 3 3 3 3 3 3 3 3		2 2 2 2 2 2 2 2 2 2 2 2 2 2	4 12 4 4 4 4 4 4 4 4 4 4
MCL442 TXL773 Interdis Specializ Core 1 MCL111+ MCL212# ELL225# COP315* ELL365* *Students +Core for I Other Stur Core 2 JRL301 Core 3	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as coof CS1/CS5 to take only one of these courses as coof CS1/CS5 to take only one of the Core 1 courses mental Robotics Technology	3 3 3 0 3 ore.	0 0 1 1 0	2 2 0 6 0	3 4 4 4 4 4 3	Specializ COL703 Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL761 COL762 COL764 COL765 COL770 COL786 COL786 COL865	Logic for Computer Science Total Credits Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming Advanced Artificial Intelligence Advanced Functional Brain Imaging Special Topics in Computer Applications	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3		2 2 2 2 2 2 2 2 0	4 4 4 4 4 4 4 4 4 4 4 4 4 3 3
MCL442 TXL773 Interdis Specializ Core 1 MCL111 ⁺ MCL212 [#] ELL225 [#] COP315 ² ELL365* *Students +Core for to Other Stur Core 2 JRL301	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as coorden's students only. Idents can select any one of the Core 1 courses mental Robotics Technology Mini Project in Robotics	3 3 3 0 3 ore.	0 0 1 1 0	2 2 0 6 0	3 4 4 4 4 3 3	Specializ COL703 Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL764 COL765 COL770 COL786 COL786 COL865 COL869	Logic for Computer Science Total Credits Zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming Advanced Artificial Intelligence Advanced Functional Brain Imaging Special Topics in Computer Applications Special Topics in Concurrency	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3		2 2 2 2 2 2 2 2 0 0	4 4 4 4 4 4 4 4 4 4 4 4 3 3 3 3 3 3 3 3
MCL442 TXL773 Interdis Specializ Core 1 MCL111+ MCL212# ELL225# COP315* ELL365* *Students +Core for I Other Stur Core 2 JRL301 Core 3	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as coof CS1/CS5 to take only one of these courses as coof CS1/CS5 to take only one of the Core 1 courses mental Robotics Technology	3 3 3 0 3 ore.	0 0 1 1 0	2 2 0 6 0	3 4 4 4 4 4 3	Specializ COL703 Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL764 COL765 COL770 COL786 COL786 COL865 COL869 COV885	Logic for Computer Science Total Credits Zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming Advanced Artificial Intelligence Advanced Functional Brain Imaging Special Topics in Computer Applications Special Module in Computer Applications	3 3 3 3 3 3 3 3 3 3 1		2 2 2 2 2 2 2 2 2 2 2 2 0 0 0 0 0	4 4 4 4 4 4 4 4 4 4 4 4 1 1
MCL442 TXL773 Interdis Specializ Core 1 MCL111+ MCL212# ELL225# COP315* ELL365* *Students +Core for I Other Stur Core 2 JRL301 Core 3	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as coorden's students only. Idents can select any one of the Core 1 courses mental Robotics Technology Mini Project in Robotics	3 3 3 0 3 ore.	0 0 1 1 0	2 2 0 6 0	3 4 4 4 4 3 3	Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL764 COL765 COL770 COL786 COL869 COV885 COV888	Logic for Computer Science Total Credits Zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming Advanced Artificial Intelligence Advanced Functional Brain Imaging Special Topics in Computer Applications Special Module in Computer Applications Special Module in Database Systems	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3		2 2 2 2 2 2 2 2 0 0	4 4 4 4 4 4 4 4 4 4 4 4 1 1
MCL442 TXL773 Interdis Specializ Core 1 MCL111+ MCL212# ELL225# COP315* ELL365* *Students +Core for to Other Stur Core 2 JRL301 Core 3 JRD301	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as confocial CS5 to take only one of these courses as confocial Embedded Systems of CS1/CS5 to take only one of these courses as confocial Ethesa students only. dents can select any one of the Core 1 courses mental Robotics Technology Mini Project in Robotics Total Credits	3 3 3 0 3 ore.	0 0 1 1 0	2 2 0 6 0	3 4 4 4 4 3 3	Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL764 COL765 COL770 COL786 COL869 COV885 COV888	Logic for Computer Science Total Credits Zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming Advanced Artificial Intelligence Advanced Functional Brain Imaging Special Topics in Computer Applications Special Module in Computer Applications Special Module in Database Systems	3 3 3 3 3 3 3 3 3 3 1		2 2 2 2 2 2 2 2 2 2 2 2 0 0 0 0 0	4 12 4 4 4 4 4 4 4 4 4 4 4 4 1 1 1 1 1 1
MCL442 TXL773 Interdis Specializ Core 1 MCL111+ MCL212# ELL225# ELL365* *Students +Core for I Other Stur Core 2 JRL301 Core 3 JRD301 Since the 6	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as co of CS1/CS5 to take only one of these courses as co of CS1/CS5 to take only one of the Core 1 courses men Robotics Technology Mini Project in Robotics Total Credits course may have Pre-requisite(s), plan in advance.	3 3 3 0 3 ore. ore.	0 0 1 1 0	0 2 2 0 6 0 abo	3 4 4 4 4 3 3 3 47 3/14	Specializ COL703 Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL764 COL765 COL770 COL786 COL869 COV885 COV888 COV888	Logic for Computer Science Total Credits Zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming Advanced Artificial Intelligence Advanced Functional Brain Imaging Special Topics in Computer Applications Special Module in Computer Applications Special Module in Database Systems Special Module in Concurrency	3 3 3 3 3 3 3 3 3 1 1 1		2 2 2 2 2 2 2 2 0 0 0 0 0 0 0	4 4 4 4 4 4 4 4 4 4 4 4 1 1 1 1
MCL442 TXL773 Interdis Specializ Core 1 MCL111+ MCL212# ELL225# ELL365* *Students +Core for I Other Stur Core 2 JRL301 Core 3 JRD301 Since the A A student	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as core of CS1/CS5 to take only one of these courses as core EE1/EE3 students only. dents can select any one of the Core 1 courses mental Robotics Technology Mini Project in Robotics Total Credits course may have Pre-requisite(s), plan in advance. is required to complete (one of the core 1 course),	3 3 3 0 3 ore. ore.	0 0 1 1 0	0 2 2 0 6 0 abo	3 4 4 4 4 3 3 3 47 3/14	Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL764 COL765 COL770 COL786 COL869 COV885 COV888	Logic for Computer Science Total Credits Zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming Advanced Artificial Intelligence Advanced Functional Brain Imaging Special Topics in Computer Applications Special Topics in Computer Applications Special Module in Computer Applications Special Module in Concurrency Internet Traffic-Measurement,	3 3 3 3 3 3 3 3 3 1 1		2 2 2 2 2 2 2 2 0 0 0 0 0 0 0	4 4 4 4 4 4 4 4 4 4 4 4 1 1 1 1
MCL442 TXL773 Interdis Specializ Core 1 MCL111+ MCL212# ELL225# ELL365* *Students +Core for I Other Stur Core 2 JRL301 Core 3 JRD301 Since the 6	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as core of CS1/CS5 to take only one of these courses as core EE1/EE3 students only. dents can select any one of the Core 1 courses mental Robotics Technology Mini Project in Robotics Total Credits course may have Pre-requisite(s), plan in advance. is required to complete (one of the core 1 course),	3 3 3 0 3 ore. ore.	0 0 1 1 0	0 2 2 0 6 0 abo	3 4 4 4 4 3 3 3 47 3/14	Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL764 COL765 COL770 COL786 COL865 COL869 COV888 COV888 SIL769	Logic for Computer Science Total Credits zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming Advanced Artificial Intelligence Advanced Functional Brain Imaging Special Topics in Computer Applications Special Topics in Computer Applications Special Module in Computer Applications Special Module in Concurrency Internet Traffic-Measurement, Modeling & Analysis	3 3 3 3 3 3 3 3 3 1 1 1 3		2 2 2 2 2 2 2 2 0 0 0 0 0 2	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
Interdis Specializ Core 1 MCL111+ MCL212# ELL25# COP315* ELL365* *Students +Core for I Other Stu Core 2 JRL301 Since the A A student and (core 1	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as conformation of CS1/CS5 to take only one of these courses as conformation of CS1/CS5 to take only one of these courses as conformation of CS1/CS5 to take only one of the Core 1 courses medicated any one of the Core 1 courses medicated to complete (one of the core 1 course), 3 course).	3 3 3 0 3 ore. ore.	0 0 1 1 0	0 2 2 0 6 0 abo	3 4 4 4 4 3 3 3 47 3/14	Specializ COL703 Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL761 COL762 COL765 COL770 COL786 COL865 COL865 COV888 COV888 SIL769 SIL801	Logic for Computer Science Total Credits Zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming Advanced Artificial Intelligence Advanced Functional Brain Imaging Special Topics in Computer Applications Special Topics in Concurrency Special Module in Concurrency Internet Traffic-Measurement, Modeling & Analysis Special Topics in Multimedia System	3 3 3 3 3 3 3 3 3 3 3 1 1 1 3 3		2 2 2 2 2 2 2 2 2 0 0 0 0 0 2 0	4 4 4 4 4 4 4 4 4 4 4 4 3 3 1 1 1 1 1 4 3 3 3 3
Interdis Specializ Core 1 MCL111+ MCL212# ELL25# COP315* ELL365* *Students +Core for I Other Stu Core 2 JRL301 Since the A A student and (core 1	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as core of CS1/CS5 to take only one of these courses as core EE1/EE3 students only. dents can select any one of the Core 1 courses mental Robotics Technology Mini Project in Robotics Total Credits course may have Pre-requisite(s), plan in advance. is required to complete (one of the core 1 course),	3 3 3 0 3 ore. ore.	0 0 1 1 0 0	2 2 0 6 0	3 4 4 4 4 3 3 47 3/14	Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL764 COL765 COL770 COL786 COL865 COL869 COV888 COV888 SIL769	Logic for Computer Science Total Credits Zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming Advanced Artificial Intelligence Advanced Functional Brain Imaging Special Topics in Computer Applications Special Topics in Concurrency Special Module in Computer Applications Special Module in Concurrency Internet Traffic-Measurement, Modeling & Analysis Special Topics in Multimedia System Special Topics in Web Based Computing	3 3 3 3 3 3 3 3 3 1 1 1 3		2 2 2 2 2 2 2 2 0 0 0 0 0 2	4 4 4 4 4 4 4 4 4 4 4 4 3 3 1 1 1 1 1 4 3 3 3 3
Interdis Specializ Core 1 MCL111+ MCL212# ELL25# COP315* ELL365* *Students #Students +Core for I Other Stu Core 2 JRL301 Core 3 JRD301 Since the c A student and (core s	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as conformation of CS1/CS5 to take only one of these courses as conformation of CS1/CS5 to take only one of these courses as conformation of CS1/CS5 to take only one of the Core 1 courses medicated any one of the Core 1 courses medicated to complete (one of the core 1 course), 3 course).	3 3 3 0 3 ore. ore.	0 0 1 1 0 0	0 2 2 0 6 0 abo	3 4 4 4 4 3 3 47 3/14	Specializ COL703 Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL761 COL762 COL765 COL770 COL786 COL865 COL865 COV888 COV888 SIL769 SIL801	Logic for Computer Science Total Credits Zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming Advanced Artificial Intelligence Advanced Functional Brain Imaging Special Topics in Computer Applications Special Topics in Concurrency Special Module in Concurrency Internet Traffic-Measurement, Modeling & Analysis Special Topics in Multimedia System	3 3 3 3 3 3 3 3 3 3 3 1 1 1 3 3		2 2 2 2 2 2 2 2 2 0 0 0 0 0 2 0	4 4 4 4 4 4 4 4 4 4 4 4 4 4 3 3 1 1 1 1
MCL442 TXL773 Interdis Specializ Core 1 MCL111+ MCL212# ELL225# COP315* ELL365* *Students +Core for I Other Stu Core 2 JRL301 Core 3 JRD301 Since the c A student and (core s Specializ COL106	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as conformation of CS1/CS5 to take only one of these courses as conformation of CS1/CS5 to take only one of these courses as conformation of CS1/CS5 to take only one of these courses as conformation of CS1/CS5 to take only one of these courses as conformation of CS1/CS5 to take only one of these courses as conformation of CS1/CS5 to take only one of these courses as conformation of CS1/CS5 to take only one of these courses are co	3 3 3 0 3 3 0 7 7 7 7 7 7 7 7 7 7 7 7 7	0 0 1 1 0 0 0 0	0 2 2 0 6 0 1. 1:	3 4 4 4 4 3 3 47 3/14	Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL761 COL765 COL765 COL770 COL865 COL869 COV888 COV888 COV888 SIL769 SIL801 SIL802 SIV813	Logic for Computer Science Total Credits Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming Advanced Artificial Intelligence Advanced Functional Brain Imaging Special Topics in Computer Applications Special Topics in Concurrency Special Module in Database Systems Special Module in Concurrency Internet Traffic-Measurement, Modeling & Analysis Special Topics in Multimedia System Special Topics in Web Based Computing Applications of Computer in Medicines	3 3 3 3 3 3 3 3 3 3 1 1 1 3 3 3 1		2 2 2 2 2 2 2 2 2 0 0 0 0 0 2 0 0 0 0	4 4 4 4 4 4 4 4 4 4 4 4 4 4 3 3 1 1 1 1
MCL442 TXL773 Interdis Specializ Core 1 MCL111+ MCL212# ELL225# COP315* ELL365* *Students +Core for I Other Stu Core 2 JRL301 Since the A A student and (core second core seco	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as confocial Courses as confocial Course only. Medical Textiles Mini Project in Robotics Total Credits Course may have Pre-requisite(s), plan in advance. Is required to complete (one of the core 1 course), a course). Mation Electives Data Structures Principles of Artificial Intelligence	3 3 3 3 0 3 3 ore. re. ntion 3 0 (col	0 0 1 1 0 0 0 0 0	0 2 2 0 6 0 0 1. 1:	3 4 4 4 4 3 3 47 3/14	Specializ COL703 Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL761 COL762 COL765 COL770 COL786 COL869 COV888 COV888 SIL769 SIL801 SIL802	Logic for Computer Science Total Credits Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming Advanced Artificial Intelligence Advanced Functional Brain Imaging Special Topics in Computer Applications Special Topics in Concurrency Special Module in Computer Applications Special Module in Concurrency Internet Traffic-Measurement, Modeling & Analysis Special Topics in Web Based Computing Applications of Computer in Medicines Information and Comm Technologies	3 3 3 3 3 3 3 3 3 3 1 1 1 3 3 3		2 2 2 2 2 2 2 2 2 0 0 0 0 0 2 0 0	4 4 4 4 4 4 4 4 4 4 4 4 4 4 3 3 1 1 1 1
MCL442 TXL773 Interdis Specializ Core 1 MCL111+ MCL212# ELL25# COP315* ELL365* *Students #Students +Core for to Other Stut Core 2 JRL301 Since the of A student and (core second core seco	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as confocial CS5 to take only one of these courses as confocial CS5 to take only one of these courses as confocial CS5 to take only one of the Core 1 courses medically dents can select any one of the Core 1 courses medical Course may have Pre-requisite(s), plan in advance. Its required to complete (one of the core 1 course), 3 course). Exaction Electives Data Structures Principles of Artificial Intelligence Machine Learning	3 3 3 0 3 ore. ore. of (contions 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 0 1 1 0 0 0 0 0 0	0 2 2 0 6 0 0 1. 1:	3 4 4 4 4 3 3 47 3/14 uurse)	Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL761 COL765 COL7760 COL786 COL865 COL869 COV888 COV888 COV889 SIL769 SIL801 SIL802 SIV813 SIV861	Logic for Computer Science Total Credits Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming Advanced Artificial Intelligence Advanced Functional Brain Imaging Special Topics in Computer Applications Special Topics in Concurrency Special Module in Computer Applications Special Module in Concurrency Internet Traffic-Measurement, Modeling & Analysis Special Topics in Multimedia System Special Topics in Web Based Computing Applications of Computer in Medicines Information and Comm Technologies for Development	3 3 3 3 3 3 3 3 3 3 1 1 1 3 3 3 1 1		2 2 2 2 2 2 2 2 2 0 0 0 0 0 0 0 0 0 0 0	4 4 4 4 4 4 4 4 4 4 4 4 4 4 7 1 1 1 1 1
MCL442 TXL773 Interdis Specializ Core 1 MCL111+ MCL212# ELL225# COP315* ELL365* *Students +Core for to the Students -Core 2 JRL301 Core 3 JRD301 Since the control of the Student and (core second core second cor	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as confocial CS5 to take only one of these courses as confocial CS5 to take only one of these courses as confocial CS5 to take only one of the Core 1 courses mental Robotics Technology Mini Project in Robotics Total Credits Course may have Pre-requisite(s), plan in advance, is required to complete (one of the core 1 course), 3 course). Exation Electives Data Structures Principles of Artificial Intelligence Machine Learning Analysis and Design of Algorithms	3 3 3 0 3 ore. ore. of tion 3 3 3 3 3 3 3 3	0 0 1 1 0 0 0 0 0 0 1	0 2 2 0 6 0 1. 1. 2 2 2 2 0	3 4 4 4 4 3 3 47 3/14 4 4 4 4	Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL761 COL765 COL765 COL770 COL865 COL869 COV888 COV888 COV888 SIL769 SIL801 SIL802 SIV813	Total Credits Zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming Advanced Artificial Intelligence Advanced Functional Brain Imaging Special Topics in Computer Applications Special Topics in Concurrency Special Module in Concurrency Internet Traffic-Measurement, Modeling & Analysis Special Topics in Multimedia System Special Topics in Web Based Computing Applications of Computer in Medicines Information and Comm Technologies for Development Special Module on Media Processing &	3 3 3 3 3 3 3 3 3 3 1 1 1 3 3 3 1		2 2 2 2 2 2 2 2 2 0 0 0 0 0 2 0 0 0 0	4 4 4 4 4 4 4 4 4 4 4 4 4 4 7 1 1 1 1 1
MCL442 TXL773 Interdis Specializ Core 1 MCL111+ MCL212# ELL225# COP315* ELL365* *Students +Core for to Other Stut Core 2 JRL301 Core 3 JRD301 Since the control of the student and (core second core s	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as confocial Students only. dents can select any one of the Core 1 courses ment Robotics Technology Mini Project in Robotics Total Credits course may have Pre-requisite(s), plan in advance. is required to complete (one of the core 1 course), 3 course). settion Electives Data Structures Principles of Artificial Intelligence Machine Learning Analysis and Design of Algorithms Artificial Intelligence	3 3 3 0 3 ore. ore. of (contions 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 0 1 1 0 0 0 0 0 0 1	0 2 2 0 6 0 0 1. 1:	3 4 4 4 4 3 3 47 3/14 4 4 4 4	Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL761 COL765 COL7760 COL786 COL865 COL869 COV888 COV888 COV889 SIL769 SIL801 SIL802 SIV813 SIV861	Logic for Computer Science Total Credits Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming Advanced Artificial Intelligence Advanced Functional Brain Imaging Special Topics in Computer Applications Special Module in Computer Applications Special Module in Concurrency Internet Traffic-Measurement, Modeling & Analysis Special Topics in Web Based Computing Applications of Computer in Medicines Information and Comm Technologies for Development Special Module on Media Processing & Communication	3 3 3 3 3 3 3 3 3 3 1 1 1 3 3 3 1 1 1		2 2 2 2 2 2 2 2 2 0 0 0 0 0 0 0 0 0 0 0	4 4 4 4 4 4 4 4 4 4 4 4 4 4 7 1 1 1 1 1
MCL442 TXL773 Interdis Specializ Core 1 MCL111+ MCL212# ELL225# COP315* ELL365* *Students +Core for to Other Stut Core 2 JRL301 Core 3 JRD301 Since the control of the student and (core second core s	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as confocial CS5 to take only one of these courses as confocial CS5 to take only one of these courses as confocial CS5 to take only one of the Core 1 courses mental Robotics Technology Mini Project in Robotics Total Credits Course may have Pre-requisite(s), plan in advance, is required to complete (one of the core 1 course), 3 course). Exation Electives Data Structures Principles of Artificial Intelligence Machine Learning Analysis and Design of Algorithms	3 3 3 0 3 ore. ore. of tion 3 3 3 3 3 3 3 3	0 0 1 1 0 0 0 0 0 0 0 1 0	0 2 2 0 6 0 1. 1. 2 2 2 2 0	3 4 4 4 4 3 3 47 3/14 4 4 4 4	Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL761 COL765 COL7760 COL786 COL865 COL869 COV888 COV888 COV889 SIL769 SIL801 SIL802 SIV813 SIV861	Total Credits Zation Electives Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming Advanced Artificial Intelligence Advanced Functional Brain Imaging Special Topics in Computer Applications Special Topics in Concurrency Special Module in Concurrency Internet Traffic-Measurement, Modeling & Analysis Special Topics in Multimedia System Special Topics in Web Based Computing Applications of Computer in Medicines Information and Comm Technologies for Development Special Module on Media Processing &	3 3 3 3 3 3 3 3 3 3 1 1 1 3 3 3 1 1 1		2 2 2 2 2 2 2 2 2 0 0 0 0 0 0 0 0 0 0 0	4 4 4 4 4 4 4 4 4 4 4 4 1 1 1 1
MCL442 TXL773 Interdis Specializ Core 1 MCL111+ MCL212# ELL225# COP315* ELL365* *Students +Core for to Other Students JRD301 Since the CA student and (core Specializ COL106 COL333 COL341 COL351 COL671 COL740	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as confocial Students only. dents can select any one of the Core 1 courses ment Robotics Technology Mini Project in Robotics Total Credits course may have Pre-requisite(s), plan in advance, is required to complete (one of the core 1 course), 3 course). cation Electives Data Structures Principles of Artificial Intelligence Machine Learning Analysis and Design of Algorithms Artificial Intelligence Software Engineering	3 3 3 3 0 3 0 ore. re. or of cool 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 0 1 1 0 0 0 0 0 1 0 0	0 2 2 0 6 0 1. 1: 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 4 4 4 4 3 3 47 3/14 4 4 4 4 4	Specializ COL703 Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL764 COL765 COL770 COL786 COL865 COL869 COV885 COV888 COV888 SIL769 SIL801 SIL802 SIV813 SIV861 SIV864 SIV871	Logic for Computer Science Total Credits Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming Advanced Artificial Intelligence Advanced Functional Brain Imaging Special Topics in Computer Applications Special Module in Computer Applications Special Module in Concurrency Internet Traffic-Measurement, Modeling & Analysis Special Topics in Web Based Computing Applications of Computer in Medicines Information and Comm Technologies for Development Special Module on Media Processing & Communication Special Module in Computational Neuroscience	3 3 3 3 3 3 3 3 3 3 1 1 1 3 3 3 1 1 1 1		2 2 2 2 2 2 2 2 2 0 0 0 0 0 0 0 0 0 0 0	4 4 4 4 4 4 4 4 4 4 4 4 1 1 1 1
MCL442 TXL773 Interdis Specializ Core 1 MCL111+ MCL212# ELL225# COP315* ELL365* *Students #Students +Core for to Other Stut Core 2 JRL301 Core 3 JRD301 Since the control of the control	Medical Textiles sciplinary Specialization in Robotication Core Kinematics and Dynamics of Machines Control Theory and Applications Control Engineering-I Embedded System Design Project Embedded Systems of ME1/ME2 to take only one of these courses as confocial Students only. dents can select any one of the Core 1 courses ment Robotics Technology Mini Project in Robotics Total Credits course may have Pre-requisite(s), plan in advance. is required to complete (one of the core 1 course), 3 course). settion Electives Data Structures Principles of Artificial Intelligence Machine Learning Analysis and Design of Algorithms Artificial Intelligence	3 3 3 3 0 3 are. are. attribution 3 0 (cool 3 3 3 3 3 3 3 3 3	0 0 1 1 0 0 0 0 0 1 0 0	2 2 0 6 0 0 1. 1: 2: co	3 4 4 4 4 3 3 47 3/14 4 4 4 4 4	Specializ COL703 Specializ COL333 COL362 COL707 COL722 COL757 COL760 COL761 COL762 COL765 COL770 COL865 COL869 COV885 COV889 SIL769 SIL801 SIL802 SIV813 SIV861 SIV864	Logic for Computer Science Total Credits Principles of Artificial Intelligence* Introduction to Database Mgmt. Systems* Introduction to Ethical Issues in Computer Science Introduction to Compressed Sensing Model Centric Algorithm Design Advanced Data Management Data Mining Database Implementation Information Retrieval and Web Search Introduction to Logic and Functional Programming Advanced Artificial Intelligence Advanced Functional Brain Imaging Special Topics in Computer Applications Special Module in Computer Applications Special Module in Concurrency Internet Traffic-Measurement, Modeling & Analysis Special Topics in Web Based Computing Applications of Computer in Medicines Information and Comm Technologies for Development Special Module on Media Processing & Communication	3 3 3 3 3 3 3 3 3 3 1 1 1 3 3 3 1 1 1		2 2 2 2 2 2 2 2 2 0 0 0 0 0 0 0 0 0 0 0	4 4 4 4 4 4 4 4 4 4 4 4 1 1 1 1

SIV895 Special Module on Intelligent	1	0	0	1		Computer Graphics	3	0	
Information Processing					COL783	Digital Image Analysis Virtual and Augmented Reality	3 3	0	
Departmental Specialization in Archite	ecti	ıre		nd		Advanced Computer Graphics	3	0	
Embedded Systems (Department of						Special Module on Visual Computing	1	0	0 1
Science and Engineering)			pui		SIL801	Special Topics in Multimedia System	3	0	0 3
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Specialization Core	0	0	16	0		mental Specialization in Softwar			
COD494 B.Tech. Project Part-II COL703 Logic for Computer Science	0 3		16 2		(Depar	tment of Computer Science and Er	ngır	166	ring)
Total Credits	Ü	Ü		12	Specializ	zation Core			
Total Greats				12	COD494	B.Tech. Project Part-II	0		168
Specialization Electives					COL703	Logic for Computer Science	3	0	2 4
COP315 Embedded System Design Project	0	1	6	4		Total Credits			12
COL718 Architecture of High Performance Computers	3	0	2						
COL719 Synthesis of Digital Systems	3	0	2			zation Electives			
COL788 Advanced Topics in Embedded Computing COL812 System Level Design and Modelling	3	0	0			Advanced Computer Networks	3	0	
COL818 Principles of Multiprocessor Systems	3					Compiler Design Compiler Optimization	3 3	0	3 4.5 3 4.5
COP820 Processor Design Laboratory	0	0	8	4		Parallel Programming	3	0	2 4
COL821 Reconfigurable Computing	3		0			Advanced Compiler Techniques for	3	0	2 4
COL/881 Special Topics in Hardware Systems	3	0	0			Optimization, Safety and Security			
COV881 Special Module in Hardware Systems	1	U	U	1		Virtualization and Cloud Computing	3	0	
Departmental Specialization in Data Ana	alvi	lice		nd		Cloud Computing Technology Fundamentals Software Engineering	3 3	0	2 4 2 4
Artificial Intelligence (Department of						Wireless Networks	3	0	2 4
	CO	1111	pui	tei		Advanced Distributed Systems	3	0	2 4
Science and Engineering)						Special Topics in Operating Systems	3	0	0 3
Specialization Core						Special Topics in Compilers	3	0	0 3
COD494 B.Tech. Project Part-II	0		16			Special Topics in Parallel Computation	3		0 3
COL703 Logic for Computer Science	3	0	2	4		Special Topics in Software Systems Special Topics in High Speed Networks	3 3	0	0 3
Total Credits				12	COL871		3	0	0 3
Specialization Electives					COL874		3	0	0 3
Specialization Electives	2	^	2	4	0010=0	Implementation	_	_	
COL333 Principles of Artificial Intelligence* COL341 Machine Learning	3	0	2			Special Topics in Formal Methods	3	0	
COL362 Introduction to Database Mgmt. Systems*	3	Ö	2			Special Topics in Operating Systems Special Module on Automated Reasoning	3 1	0	0 3
COL760 Advanced Data Management	3	0	2	4	001010	Methods for Program Analysis	•	Ŭ	0 1
COL761 Data Mining	3		2			Special Module in Parallel Computation	1	0	0 1
COL762 Database Implementation COL764 Information Retrieval and Web Search	3		2			Special Module in Software Systems	1	0	0 1
COL765 Introduction to Logic and Functional Programming	3	0	2		SIL765	Special Module in High Speed Networks Networks & System Security	1 3	0	0 1 2 4
COL770 Advanced Artificial Intelligence	3		2		SIL765 SIL769	Internet Traffic -Measurement,	3	0	
COL772 Natural Language Processing	3		2		0.2.00	Modeling & Analysis	Ū	·	
COL774 Machine Learning	3		2			•			
COL775 Deep Learning COL776 Learning Probabilistic Graphical Models	3	0	2		Depart	mental Specialization in Theoretica	ıl Co	om	puter
COL777 Deep Reinforcement Learning	3		2			ce (Department of Computer Sc			•
COL778 Principles of Autonomous Systems	3		2		Engine				
COL786 Advanced Functional Brain Imaging	3	0	2		•	zation Core			
COL864 Special Topics in Artificial Intelligence	3		0			B.Tech. Project Part-II	0	0	168
COL868 Special Topics in Database Systems COL869 Special Topics in Concurrency	3		0			Logic for Computer Science	3	0	
COL870 Special Topics in Machine Learning	3		0		002.00	Total Credits	·	Ū	12
COL873 Special Topics in Natural Language Processing			0			Total Greats			
COV878 Special Module in Machine Learning	1		0		Specializ	zation Electives			
COV884 Special Module in Artificial Intelligence	1		0		COL726	Numerical Algorithms	3	0	2 4
COV888 Special Module in Database Systems COV889 Special Module in Concurrency	1 1		0			Rapid Mixing in Markov Chains	3	0	0 3
CO VOCO Oposiai inicuale in Consumonsy	•	Ŭ	Ü	•		Parallel Programming	3	0	2 4
Departmental Specialization in Graphics	an	d V	/isi	on		Computational Social Choice	3	0	0 3
(Department of Computer Science and Er						Foundations of Automatic Verification Algorithmic Graph Theory	3 3	0	2 4 0 3
	•			3,		Geometric Algorithms	3	0	0 3
Specialization Core COD494 B.Tech. Project Part-II	^	^	10	Ω		Complexity Theory	3	0	0 3
COL703 Logic for Computer Science	0 3		16 2		COL754	Approximation Algorithms	3	0	0 3
Total Credits	J	J		т 12		Algorithmic Game Theory	3	0	0 3
Total Greats				12		Mathematical Programming Model Centric Algorithm Design	3 3	0	0 3 2 4
Specialization Electives						Advanced Algorithms	3	0	2 4
COL780 Computer Vision	3	0	2	4		Cryptography & Computer Security	3		0 3
•						•			

COL 787	0 1: 41 ::1 10 :::: 4 1 :		_	^	3			_		
OOLIGI	Online Algorithms and Competitive Analysis	3	0			CVL770	Prestressed and Composite Structures	3	-	0
	Distributed Computing	3	0		3		Advanced Concrete Technology	3		0
	Semantics of Programming Languages	3		0			Structural Safety and Reliability	3		0
	Proofs and Types	3		0			Theory of Plates and Shells	3		0
	Special Topics in Parallel Computation	3	0		3	CVL859 CVL862	Theory of Structural Stability Design of Offshore Structures	3		0
	Special Topics in Theoretical Computer Science Special Topics in Algorithms	3	0	0	3		Wind Resistant Design of Structures	3		0
	Special Topics in Algorithms Special Topics in Cryptography	3	-	0		CVLOOO	Wild Resistant Design of Structures	5	U	0
	Special Topics in Compilers and Language	3		0		Donor	tmontal Charielization in Trans		4	-41
00207 1	Implementation	Ū	Ŭ	Ū	Ü	_	tmental Specialization in Trans			
COL876	Special Topics in Formal Methods	3	0	0	3	Engine	ering (Department of Civil Engine	erii	ng	
	Special Module in Financial Algorithms	2	0	0	2	Specializ	zation Core			
COV883	Special Module in Theoretical Computer Science	1		0		CVD412	B.Tech. Project Part-II	0	0	12
COV886	Special Module in Algorithms	1	0	0	1		Pavement Materials and Design of Pavements	2	0	2
							Urban and Regional Transportation Planning		0	2
Depar	tmental Specialization in Envi	ror	٦m	e	ntal	CVL742	Traffic Engineering	3	0	2 4
Engine	eering (Department of Civil Engine	eri	ng)			Total Credits			
	zation Core		Ĭ	•						
	B.Tech. Project Part-II	0	0	1:	26		zation Electives (8 Credits)			
	Air and Noise Pollution	3		0			Introduction to Railway Engineering	3		0
	Solid Waste Engineering	3		0			Logistics and Freight Transport	3	0	0
	Environmental Systems Analysis	3		2		CVL462	Introduction to Intelligent	3	0	0
	Total Credits				16	0) # = 40	Transportation Systems	_	_	
	Total Credits				70		Airport Planning and Design	3	-	0
Sneciali:	zation Electives (8 Credits)						Transportation Infrastructure Design	3		0
		_	_	_			Public Transportation Systems	3		0
	Industrial Waste Management	3		0			Advanced Transportation Modelling	2		2
	Environmental Assessment Methodologies	3		0			Geometric Design of Roads	2		2
	Environmental Risk Assessment	3	0	0		CVL847	Transportation Economics	3	U	0
	Environmental Impact Assessment Emerging Technologies for	3	0		3					
CVLUZZ	Environmental Management	J	U	U	3		mental Specialization in Water			
		3	0			Engine	ering (Department of Civil Engine	eri	ng)	
CVI 823				O	3					
	Thermal Techniques for Waste Mgmt. Life Cycle Analysis & Design for Environment				3 3	Specializ	zation Core			
	Life Cycle Analysis & Design for Environment						Croundwater	2	0	0
CVL824	Life Cycle Analysis & Design for Environment	3	0	0	3	CVL382	Groundwater	2		0 :
CVL824 Depar	Life Cycle Analysis & Design for Environment tmental Specialization in Geo	3 te	0 ch	0 ni	3	CVL382 CVL481	Groundwater Water Resources Management	3	0	0
CVL824 Depar Engine	Life Cycle Analysis & Design for Environment tmental Specialization in Geo eering (Department of Civil Engine	3 te	0 ch	0 ni	3	CVL382 CVL481 CVL482	Groundwater Water Resources Management Water Power Engineering	3	0	
CVL824 Depar Engine Specializ	Life Cycle Analysis & Design for Environment the the thick the control of the cycle and the cycle an	3 te	0 ch	0 ni	3	CVL382 CVL481 CVL482 CVL483	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution	3 2	0 0	0 :
Depar Engine Specialia CVD412	Life Cycle Analysis & Design for Environment tmental Specialization in Geo eering (Department of Civil Engine zation Core B.Tech. Project Part-II	3 ote eri 0	0 ch ng	0 n i)	3 cal 26	CVL382 CVL481 CVL482 CVL483	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B.Tech. Project Part-II	3 2 2	0 0	0 2 0 12
Depar Engine Specializ CVD412 CVL421	Life Cycle Analysis & Design for Environment tmental Specialization in Geo eering (Department of Civil Engine zation Core B.Tech. Project Part-II Ground Engineering	3 ote eri 0 3	o ch ng 0	0 ini)	3 (cal 26 3	CVL382 CVL481 CVL482 CVL483	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution	3 2 2	0 0	0 :
Depar Engine Specializ CVD412 CVL421 CVL422	Life Cycle Analysis & Design for Environment tmental Specialization in Geo eering (Department of Civil Engine zation Core B. Tech. Project Part-II Ground Engineering Rock Engineering	3 ote eri 0 3 3	0 ng 0 0	0 (ni) 1: 0 0	3 [cal] 26 3 3	CVL382 CVL481 CVL482 CVL483 CVD412	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B.Tech. Project Part-II	3 2 2	0 0	0 2 0 12
Depar Engine Specialis CVD412 CVL421 CVL422 CVL423	Life Cycle Analysis & Design for Environment tmental Specialization in Geo eering (Department of Civil Engine zation Core B. Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics	3 ote eri 0 3 3 3	0 ch ng 0 0 0	0 (nii))	3 [cal 26 3 3 3	CVL382 CVL481 CVL482 CVL483 CVD412	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B.Tech. Project Part-II Total Credits	3 2 2 0	0 0 0 0	0 2 0 12
Depar Engine Specialis CVD412 CVL421 CVL422 CVL423	Life Cycle Analysis & Design for Environment tmental Specialization in Geo eering (Department of Civil Engine zation Core B.Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics	3 ote eri 0 3 3 3	0 ch ng 0 0 0	0 (ni) 1: 0 0	3 [cal] 26 3 3 3 3	CVL382 CVL481 CVL482 CVL483 CVD412	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B.Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic	3 2 2 0	0 0 0 0	0 2 0 12
Depar Engine Specialis CVD412 CVL421 CVL422 CVL423	Life Cycle Analysis & Design for Environment tmental Specialization in Geo eering (Department of Civil Engine zation Core B. Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics	3 ote eri 0 3 3 3	0 ch ng 0 0 0	0 (nii))	3 [cal 26 3 3 3	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B.Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems	3 2 2 0	0 0 0 0	0 2 0 12
Depar Engine Speciali: CVD412 CVL421 CVL422 CVL423 CVP424	Life Cycle Analysis & Design for Environment the	3 ote eri 0 3 3 3	0 ch ng 0 0 0	0 (nii))	3 [cal] 26 3 3 3 3	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B.Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic	3 2 2 0	0 0 0 0	0 : 2 : 12 : 12 : 2
Depar Engine Speciali: CVD412 CVL421 CVL422 CVL423 CVP424	Life Cycle Analysis & Design for Environment tmental Specialization in Geo eering (Department of Civil Engine zation Core B.Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics	3 ote eri 0 3 3 3	0 ch ng 0 0 0	0 (nii))	3 [cal] 26 3 3 3 3	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B.Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems	3 2 2 0	0 0 0 0 0 0	0 : 2 : 0 : 12 :
Depar Engine Speciali: CVD412 CVL421 CVL422 CVL423 CVP424 Speciali:	Life Cycle Analysis & Design for Environment the	3 ote eri	0 ch ng 0 0 0 0	0 (nii))	3 26 3 3 3 18	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B.Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology	3 2 2 0	0 0 0 0 0 0 0	0 : 2 : 12 : 12 : 12 : 12 : 12 : 12 : 12
Depar Engine Speciali: CVD412 CVL421 CVL422 CVL423 CVP424 Speciali: CVL431	Life Cycle Analysis & Design for Environment Itmental Specialization in Geo Beering (Department of Civil Engine Batton Core B. Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics Total Credits Zation Electives (6 Credits)	3 ote eri	0 ch ng 0 0 0 0 0 0 0 0	1: 0 0 0 0	3 cal 26 3 3 3 18	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385 CVL386	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B.Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology Frequency Analysis in Hydrology	3 2 2 0 2 2 2 2 2	0 0 0 0 0	0 : 2 : 0 : 12 : 0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 :
Depar Engine Specialia CVD412 CVL421 CVL422 CVL423 CVP424 Specialia CVL431 CVL432 CVL433	Life Cycle Analysis & Design for Environment Itmental Specialization in Geo Beering (Department of Civil Engine Zation Core B.Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics Total Credits Zation Electives (6 Credits) Design of Foundations & Retaining Structures Stability of Slopes FEM in Geotechnical Engineering	3 0 te eri 0 3 3 3 3 3 3 3 2 3	0 ch ng 0 0 0 0 0	0 11 0 0 0 0 0	3 2 3 3 3 2 3 3 3 2 3 3 3 3 2 3 3 3 3 3	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385 CVL386 CVP484	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B.Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology Frequency Analysis in Hydrology Fundamentals of Remote Sensing	3 2 2 0 2 2 2 2 1 2	0 0 0 0 0	0 : 2 : 0 : 12 : 0 : 0 : 2 : 4 : 2 : 2 : 2
Depar Engine Specialia CVD412 CVL421 CVL422 CVL423 CVP424 Specialia CVL431 CVL432 CVL433 CVL433 CVL434	Life Cycle Analysis & Design for Environment Itmental Specialization in Geo Beering (Department of Civil Engine Zation Core B.Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics Total Credits Zation Electives (6 Credits) Design of Foundations & Retaining Structures Stability of Slopes FEM in Geotechnical Engineering Geotechnical Design Studio	3 0 te eri 0 3 3 3 3 3 3 2 3 0	0 ch ng 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 11 1 0 0 0 0 0 0 4	3 2 3 2	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385 CVL386 CVP484 CVL485 CVL485	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B.Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology Frequency Analysis in Hydrology Fundamentals of Remote Sensing Computational Aspects in Water Resources River Mechanics Geo-informatics	3 2 2 0 2 2 2 2 1 2 2	0 0 0 0 0 0 0 0 0	0 : 2 : 12 : 12 : 12 : 12 : 12 : 12 : 12
Depar Engine Specialia CVD412 CVL421 CVL422 CVL423 CVP424 Specialia CVL431 CVL432 CVL433 CVL433 CVL434	Life Cycle Analysis & Design for Environment Itmental Specialization in Geo Beering (Department of Civil Engine Zation Core B.Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics Total Credits Zation Electives (6 Credits) Design of Foundations & Retaining Structures Stability of Slopes FEM in Geotechnical Engineering	3 0 te eri 0 3 3 3 3 3 3 3 2 3	0 ch ng 0 0 0 0 0	0 11 1 0 0 0 0 0 0 4	3 2 3 3 3 2 3 3 3 2 3 3 3 3 2 3 3 3 3 3	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385 CVL386 CVP484 CVL485 CVL485	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B.Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology Frequency Analysis in Hydrology Fundamentals of Remote Sensing Computational Aspects in Water Resources River Mechanics	3 2 2 0 2 2 2 2 1 2	0 0 0 0 0 0 0 0 0	0 : 2 : 0 : 12 : 0 : 0 : 2 : 4 : 2 : 2 : 2
Depar Engine Specialia CVD412 CVL421 CVL422 CVL423 CVP424 Specialia CVL431 CVL432 CVL433 CVL434 CVL435	Life Cycle Analysis & Design for Environment Itmental Specialization in Geo Beering (Department of Civil Engine Zation Core B.Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics Total Credits Zation Electives (6 Credits) Design of Foundations & Retaining Structures Stability of Slopes FEM in Geotechnical Engineering Geotechnical Design Studio Underground Structures	3 0 3 3 3 3 3 2 3 0 2	0 ch ng 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 11 0 0 0 0 0 0 0 0	3 2 3 2 2	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385 CVL386 CVP484 CVL485 CVL485 CVL486 CVL487	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B.Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology Frequency Analysis in Hydrology Fundamentals of Remote Sensing Computational Aspects in Water Resources River Mechanics Geo-informatics Mechanics of Sediment Transport	3 2 2 0 2 2 2 2 2 1 2 2 3	0 0 0 0 0 0 0 0 0 0	0 : 2 : 12 : 0 : 0 : 2 : 4 : 2 : 2 : 0 : 0 : 12 : 12 : 12 : 12 : 1
Depare Engine Speciali: CVD412 CVL421 CVL422 CVL423 CVP424 Speciali: CVL431 CVL432 CVL433 CVL434 CVL435 Depart	Life Cycle Analysis & Design for Environment Itmental Specialization in Geo Bering (Department of Civil Engine Zation Core B.Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics Total Credits Zation Electives (6 Credits) Design of Foundations & Retaining Structures Stability of Slopes FEM in Geotechnical Engineering Geotechnical Design Studio Underground Structures mental Specialization in Structural Engineering	3 0 3 3 3 3 3 2 3 0 2	0 ch ng 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 11 0 0 0 0 0 0 0 0	3 2 3 2 2	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385 CVL386 CVP484 CVL485 CVL486 CVL487 Depart	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B.Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology Frequency Analysis in Hydrology Fundamentals of Remote Sensing Computational Aspects in Water Resources River Mechanics Geo-informatics Mechanics of Sediment Transport mental Specialization in Automote	3 2 2 0 2 2 2 2 2 1 2 2 3	0 0 0 0 0 0 0 0 0 0	0 : 2 : 12 : 0 : 0 : 2 : 4 : 2 : 2 : 0 : 0 : 12 : 12 : 12 : 12 : 1
Depare Engine Speciali: CVD412 CVL421 CVL422 CVL423 CVP424 Speciali: CVL431 CVL432 CVL433 CVL434 CVL435 Depart	Life Cycle Analysis & Design for Environment Itmental Specialization in Geo Beering (Department of Civil Engine Zation Core B.Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics Total Credits Zation Electives (6 Credits) Design of Foundations & Retaining Structures Stability of Slopes FEM in Geotechnical Engineering Geotechnical Design Studio Underground Structures	3 0 3 3 3 3 3 2 3 0 2	0 ch ng 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 11 0 0 0 0 0 0 0 0	3 2 3 2 2	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385 CVL386 CVP484 CVL485 CVL486 CVL487 Depart	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B.Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology Frequency Analysis in Hydrology Fundamentals of Remote Sensing Computational Aspects in Water Resources River Mechanics Geo-informatics Mechanics of Sediment Transport	3 2 2 0 2 2 2 2 2 1 2 2 3	0 0 0 0 0 0 0 0 0 0	0 : 2 : 12 : 0 : 0 : 2 : 4 : 2 : 2 : 0 : 0 : 12 : 12 : 12 : 12 : 1
Depare Engine Specializ CVL421 CVL422 CVL423 CVP424 Specializ CVL431 CVL432 CVL433 CVL434 CVL435 Depart (Depare Engine Specializ CVL435	Life Cycle Analysis & Design for Environment Itmental Specialization in Geo Bering (Department of Civil Engine Zation Core B.Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics Total Credits Zation Electives (6 Credits) Design of Foundations & Retaining Structures Stability of Slopes FEM in Geotechnical Engineering Geotechnical Design Studio Underground Structures mental Specialization in Structural Engineering	3 0 3 3 3 3 3 2 3 0 2	0 ch ng 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 11 0 0 0 0 0 0 0 0	3 2 3 2 2	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385 CVL386 CVP484 CVL485 CVL486 CVL487 Depart (Depare)	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B.Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology Frequency Analysis in Hydrology Fundamentals of Remote Sensing Computational Aspects in Water Resources River Mechanics Geo-informatics Mechanics of Sediment Transport mental Specialization in Automote	3 2 2 0 2 2 2 2 2 1 2 2 3	0 0 0 0 0 0 0 0 0 0	0 : 2 : 12 : 0 : 0 : 2 : 4 : 2 : 2 : 0 : 0 : 12 : 12 : 12 : 12 : 1
Depart (Depar Specialize VL435	Life Cycle Analysis & Design for Environment Itmental Specialization in Geo Beering (Department of Civil Engine Zation Core B.Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics Total Credits Zation Electives (6 Credits) Design of Foundations & Retaining Structures Stability of Slopes FEM in Geotechnical Engineering Geotechnical Design Studio Underground Structures mental Specialization in Structural Entment of Civil Engineering) Zation Core	3 0 3 3 3 3 3 2 3 0 2	0 ch	0 11 0 0 0 0 0 0 0 0	3 2 3 3 3 3 3 2 2 2 ring	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385 CVL386 CVP484 CVL485 CVL486 CVL487 Depart (Depar	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B.Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology Frequency Analysis in Hydrology Fundamentals of Remote Sensing Computational Aspects in Water Resources River Mechanics Geo-informatics Mechanics of Sediment Transport mental Specialization in Automote tment of Mechanical Engineering) zation Core	2 2 2 2 2 2 1 2 2 3	0 0 0 0 0 0 0 0 0	2 : 0 : 0 : 0 : 2 : 2 : 0 : 0 : 2 : 2 :
CVL824 Depar Engine Speciali: CVD412 CVL421 CVL422 CVL423 CVP424 Speciali: CVL431 CVL432 CVL434 CVL435 Depart (Depar Speciali: CVD412	Life Cycle Analysis & Design for Environment Itmental Specialization in Geo Beering (Department of Civil Engine Zation Core B.Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics Total Credits Zation Electives (6 Credits) Design of Foundations & Retaining Structures Stability of Slopes FEM in Geotechnical Engineering Geotechnical Design Studio Underground Structures mental Specialization in Structural Enternt of Civil Engineering)	3 0 te eri 0 3 3 3 3 3 2 3 0 2 2 Eng	0 ch	0 (niii)	3 2 3 3 3 3 3 2 2 2 ring	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385 CVL386 CVP484 CVL485 CVL486 CVL487 Depart (Depar Specializ MCD412	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B.Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology Frequency Analysis in Hydrology Fundamentals of Remote Sensing Computational Aspects in Water Resources River Mechanics Geo-informatics Mechanics of Sediment Transport mental Specialization in Automote tment of Mechanical Engineering) zation Core B.Tech. Project-II	3 2 2 0 2 2 2 2 2 1 2 2 3	0 0 0 0 0 0 0 0 0	2 : 0 : 0 : 0 : 2 : 0 : 0 : 2 : 2 : 0 : 0
CVL824 Depar Engine Specializ CVD412 CVL421 CVL422 CVL423 CVP424 Specializ CVL431 CVL432 CVL433 CVL434 CVL435 Depart (Depar Specializ CVD412 CVL441	Life Cycle Analysis & Design for Environment Itmental Specialization in Geo Beering (Department of Civil Engine Zation Core B.Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics Total Credits Zation Electives (6 Credits) Design of Foundations & Retaining Structures Stability of Slopes FEM in Geotechnical Engineering Geotechnical Design Studio Underground Structures mental Specialization in Structural Etment of Civil Engineering) Zation Core B.Tech. Project Part-II	3 0 te eri 0 3 3 3 3 3 2 3 0 2 2 Eng 0	0 ch ng 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 (niii)	3 2 2 2 ring 26 3	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385 CVL386 CVP484 CVL485 CVL486 CVL487 Depart (Depar Specializ MCD412	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B.Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology Frequency Analysis in Hydrology Fundamentals of Remote Sensing Computational Aspects in Water Resources River Mechanics Geo-informatics Mechanics of Sediment Transport mental Specialization in Automote tment of Mechanical Engineering) zation Core B.Tech. Project-II Automotive Systems	3 2 2 2 2 2 2 1 2 2 3	0 0 0 0 0 0 0 0 0	2 : 0 : 12 : 0 : 2 : 4 : 2 : 2 : 0 : 14 : 2 : 2 : 2 : 14 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 :
CVL824 Depar Engine Specializ CVD412 CVL421 CVL422 CVL423 CVP424 Specializ CVL431 CVL432 CVL433 CVL434 CVL435 Depart (Depar Specializ CVD412 CVL441 CVL442	Life Cycle Analysis & Design for Environment Itmental Specialization in Geo Beering (Department of Civil Engine Zation Core B.Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics Total Credits Zation Electives (6 Credits) Design of Foundations & Retaining Structures Stability of Slopes FEM in Geotechnical Engineering Geotechnical Design Studio Underground Structures mental Specialization in Structural Entment of Civil Engineering) Zation Core B.Tech. Project Part-II Structural Design	3	0 ch ng 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	3 22 3 2 2 2 2 2 2 3 3 3 3 3 3 3 2 2 2 2 3	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385 CVL386 CVP484 CVL485 CVL486 CVL487 Depart (Depar Specializ MCD412	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B.Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology Frequency Analysis in Hydrology Fundamentals of Remote Sensing Computational Aspects in Water Resources River Mechanics Geo-informatics Mechanics of Sediment Transport mental Specialization in Automote tment of Mechanical Engineering) zation Core B.Tech. Project-II	3 2 2 2 2 2 2 1 2 2 3	0 0 0 0 0 0 0 0 0	2 : 0 : 0 : 0 : 2 : 0 : 0 : 2 : 2 : 0 : 0
CVL824 Depare Engine Speciali: CVD412 CVL421 CVL422 CVL423 CVL431 CVL432 CVL435 CVL435 Depare (Depare Speciali: CVD412 CVL441 CVL442 CVL443	Life Cycle Analysis & Design for Environment Itmental Specialization in Geo Beering (Department of Civil Engine Zation Core B.Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics Total Credits Zation Electives (6 Credits) Design of Foundations & Retaining Structures Stability of Slopes FEM in Geotechnical Engineering Geotechnical Design Studio Underground Structures mental Specialization in Structural Entment of Civil Engineering) Zation Core B.Tech. Project Part-II Structural Design Structural Analysis-III	3	0 ch ng 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 (nii)) 1.0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0	3 26 3 3 3 3 18 3 2 2 2 2 ring	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385 CVL386 CVP484 CVL485 CVL486 CVL487 Depart (Depar Specializ MCD412 MCL321	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B. Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology Frequency Analysis in Hydrology Fundamentals of Remote Sensing Computational Aspects in Water Resources River Mechanics Geo-informatics Mechanics of Sediment Transport mental Specialization in Automote tment of Mechanical Engineering) zation Core B. Tech. Project-II Automotive Systems Total Credits	3 2 2 2 2 2 2 1 2 2 3	0 0 0 0 0 0 0 0 0	2 : 0 : 12 : 0 : 2 : 4 : 2 : 2 : 0 : 14 : 2 : 2 : 2 : 14 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 :
CVL824 Depare Engine Speciali: CVD412 CVL421 CVL422 CVL423 CVL431 CVL432 CVL435 CVL435 Depare (Depare Speciali: CVD412 CVL441 CVL442 CVL443	Life Cycle Analysis & Design for Environment Itmental Specialization in Geo Beering (Department of Civil Engine Zation Core B.Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics Total Credits Zation Electives (6 Credits) Design of Foundations & Retaining Structures Stability of Slopes FEM in Geotechnical Engineering Geotechnical Design Studio Underground Structures mental Specialization in Structural Entment of Civil Engineering) Zation Core B.Tech. Project Part-II Structural Design Structural Analysis-III Prestressed Concrete & Industrial Structures	3	0 ch ng 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 (nii)) 1:00 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (3 26 3 3 3 3 18 3 2 2 2 2 ring	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385 CVL386 CVP484 CVL485 CVL486 CVL487 Depart (Depar Specializ MCD412 MCL321	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B.Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology Frequency Analysis in Hydrology Fundamentals of Remote Sensing Computational Aspects in Water Resources River Mechanics Geo-informatics Mechanics of Sediment Transport mental Specialization in Automote tment of Mechanical Engineering) zation Core B.Tech. Project-II Automotive Systems Total Credits zation Electives	3 2 2 2 2 2 2 1 2 2 3 3	0 0 0 0 0 0 0 0 0 0	2 : 0 : 12 : 0 : 0 : 2 : 4 : 2 : 2 : 0 : 14 : 2 : 2 : 14 : 2 : 2 : 2 : 14 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 :
CVL824 Depare Engine Speciali: CVD412 CVL421 CVL422 CVL423 CVL431 CVL432 CVL435 CVL435 Depare (Depare Speciali: CVD412 CVL441 CVL442 CVL443	Life Cycle Analysis & Design for Environment Itmental Specialization in Geo Beering (Department of Civil Engine Zation Core B.Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics Total Credits Zation Electives (6 Credits) Design of Foundations & Retaining Structures Stability of Slopes FEM in Geotechnical Engineering Geotechnical Design Studio Underground Structures mental Specialization in Structural Entment of Civil Engineering) Zation Core B.Tech. Project Part-II Structural Design Structural Analysis-III Prestressed Concrete & Industrial Structures Solid Mechanics in Structural Engineering	3	0 ch ng 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 (nii)) 1:00 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (3 26 3 3 3 3 18 3 2 2 2 ring	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385 CVL386 CVP484 CVL485 CVL486 CVL487 Depart (Depar Specializ MCD412 MCL321	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B. Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology Frequency Analysis in Hydrology Fundamentals of Remote Sensing Computational Aspects in Water Resources River Mechanics Geo-informatics Mechanics of Sediment Transport mental Specialization in Automote tment of Mechanical Engineering) zation Core B. Tech. Project-II Automotive Systems Total Credits zation Electives Power Train Design	3 2 2 0 2 2 2 2 2 2 3 3 ive		0 : 2 : 0 : 12 : 0 : 0 : 2 : 4 : 2 : 2 : 0 : 14 : 2 : 0 : 0 : 14 : 2 : 0 : 0 : 14 : 2 : 0 : 0 : 14 : 2 : 0 : 0 : 14 : 2 : 0 : 0 : 14 : 2 : 0 : 0 : 14 : 2 : 0 : 0 : 14 : 2 : 0 : 0 : 14 : 2 : 0 : 0 : 14 : 2 : 0 : 0 : 14 : 2 : 0 : 0 : 14 : 2 : 0 : 0 : 14 : 2 : 0 : 0 : 14 : 2 : 0 : 0 : 14 : 2 : 0 : 0 : 14 : 2 : 0 : 0 : 14 : 2 : 0 : 0 : 14 : 2 : 0 : 0 : 14 : 2 : 0 : 0 : 0 : 14 : 2 : 0 : 0 : 0 : 14 : 2 : 0 : 0 : 0 : 14 : 2 : 0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 : 0
CVL824 Depar Engine Specializ CVD412 CVL421 CVL422 CVL423 CVP424 Specializ CVL431 CVL432 CVL433 CVL434 CVL435 Depart (Depar Specializ CVD412 CVL441 CVL442 CVL443 CVL458	Life Cycle Analysis & Design for Environment Itmental Specialization in Geo Beering (Department of Civil Engine Zation Core B.Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics Total Credits Zation Electives (6 Credits) Design of Foundations & Retaining Structures Stability of Slopes FEM in Geotechnical Engineering Geotechnical Design Studio Underground Structures mental Specialization in Structural Entment of Civil Engineering) Zation Core B.Tech. Project Part-II Structural Design Structural Analysis-III Prestressed Concrete & Industrial Structures Solid Mechanics in Structural Engineering Total Credits	3	0 ch ng 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 (nii)) 1:00 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (3 26 3 3 3 3 18 3 2 2 2 ring	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385 CVL386 CVP484 CVL485 CVL486 CVL487 Depart (Depart MCD412 MCL321 MCL322 MCL421	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B. Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology Frequency Analysis in Hydrology Fundamentals of Remote Sensing Computational Aspects in Water Resources River Mechanics Geo-informatics Mechanics of Sediment Transport mental Specialization in Automotiment of Mechanical Engineering) zation Core B. Tech. Project-II Automotive Systems Total Credits zation Electives Power Train Design Automotive Structural Design	3 2 2 2 2 2 2 2 3 3 ive		0 : 2 : 0 : 12 : 0 : 2 : 2 : 0 : 2 : 2 : 2 : 0 : 2 : 2
CVL824 Depar Engine Specializ CVD412 CVL421 CVL422 CVL423 CVP424 Specializ CVL431 CVL432 CVL434 CVL435 Depart (Depar Specializ CVD412 CVL441 CVL442 CVL443 CVL443 CVL758	Life Cycle Analysis & Design for Environment Itmental Specialization in Geo Beering (Department of Civil Engine Zation Core B.Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics Total Credits Zation Electives (6 Credits) Design of Foundations & Retaining Structures Stability of Slopes FEM in Geotechnical Engineering Geotechnical Design Studio Underground Structures mental Specialization in Structural Etment of Civil Engineering) Zation Core B.Tech. Project Part-II Structural Design Structural Analysis-III Prestressed Concrete & Industrial Structures Solid Mechanics in Structural Engineering Total Credits Zation Electives (6 Credits)	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 ch ng 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 (niii) 1. (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0	3 2 2 3 2 2 2 ring 26 3 3 3 3 18	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385 CVL386 CVP484 CVL485 CVL485 CVL486 CVL4837 Depart (Depart Specializ MCD412 MCL321 MCL322 MCL421 MCL422	Groundwater Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B. Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology Frequency Analysis in Hydrology Fundamentals of Remote Sensing Computational Aspects in Water Resources River Mechanics Geo-informatics Mechanics of Sediment Transport mental Specialization in Automotiment of Mechanical Engineering) zation Core B. Tech. Project-II Automotive Systems Total Credits zation Electives Power Train Design Automotive Structural Design Design of Brake Systems	3 2 2 2 2 2 2 2 2 3 3 ive	0 0 0 0 0 0 0 0 0 0	0 : 0 : 12 : 0 : 12 : 0 : 0 : 2 : 2 : 0 : 0 : 14 : 2 : 2 : 0 : 0 : 14 : 2 : 2 : 2 : 0 : 0 : 14 : 2 : 2 : 2 : 0 : 0 : 14 : 2 : 2 : 2 : 2 : 0 : 14 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 :
CVL824 Depar Engine Specializ CVD412 CVL421 CVL422 CVL423 CVP424 Specializ CVL431 CVL432 CVL434 CVL435 Depart (Depar Specializ CVD412 CVL441 CVL442 CVL443 CVL443 CVL758	Life Cycle Analysis & Design for Environment Itmental Specialization in Geo Beering (Department of Civil Engine Zation Core B. Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics Total Credits Zation Electives (6 Credits) Design of Foundations & Retaining Structures Stability of Slopes FEM in Geotechnical Engineering Geotechnical Design Studio Underground Structures mental Specialization in Structural Entment of Civil Engineering) Zation Core B. Tech. Project Part-II Structural Design Structural Analysis-III Prestressed Concrete & Industrial Structures Solid Mechanics in Structural Engineering Total Credits Zation Electives (6 Credits) Analytical and Numerical Methods	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 ch ng 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 (niii) 1. (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0	3 26 3 3 3 3 18 3 2 2 2 ring	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385 CVL386 CVP484 CVL485 CVL486 CVL485 CVL486 CVL837 Depart (Depar Specializ MCD412 MCL321 MCL321 MCL322 MCL421 MCL422 MCL721	Groundwater Water Resources Management Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B. Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology Frequency Analysis in Hydrology Fundamentals of Remote Sensing Computational Aspects in Water Resources River Mechanics Geo-informatics Mechanics of Sediment Transport mental Specialization in Automote tment of Mechanical Engineering) zation Core B. Tech. Project-II Automotive Systems Total Credits zation Electives Power Train Design Automotive Structural Design Design of Brake Systems Automotive Prime Movers	3 2 2 2 2 2 2 2 2 3 3 ive		0 : 0 : 12 : 0 : 12 : 0 : 0 : 14 : 2 : 0 : 0 : 14 : 2 : 0 : 0 : 14 : 2 : 2 : 0 : 0 : 14 : 2 : 2 : 0 : 0 : 14 : 2 : 2 : 0 : 14 : 2 : 2 : 0 : 14 : 2 : 2 : 0 : 14 : 2 : 2 : 0 : 14 : 2 : 2 : 2 : 0 : 14 : 2 : 2 : 2 : 0 : 14 : 2 : 2 : 2 : 0 : 14 : 2 : 2 : 2 : 0 : 14 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 :
CVL824 Depar Engine Speciali: CVD412 CVL421 CVL422 CVL423 CVP424 Speciali: CVL431 CVL432 CVL433 CVL434 CVL435 Depart (Depar Speciali: CVD412 CVL441 CVL442 CVL443 CVL758 Speciali: CVL763	Life Cycle Analysis & Design for Environment Itmental Specialization in Geo Beering (Department of Civil Engine Zation Core B.Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics Total Credits Zation Electives (6 Credits) Design of Foundations & Retaining Structures Stability of Slopes FEM in Geotechnical Engineering Geotechnical Design Studio Underground Structures mental Specialization in Structural Entment of Civil Engineering) Zation Core B.Tech. Project Part-II Structural Design Structural Analysis-III Prestressed Concrete & Industrial Structures Solid Mechanics in Structural Engineering Total Credits Zation Electives (6 Credits) Analytical and Numerical Methods for Struct. Engineering	3	0 ch ng 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 26 3 3 3 18 3 2 2 2 rring 3 3 3 18 3 3 3 18	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385 CVL386 CVP484 CVL485 CVL486 CVL487 Depart (Depart MCD412 MCL321 MCL321 MCL321 MCL421 MCL422 MCL721 MCL722	Groundwater Water Resources Management Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B. Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology Frequency Analysis in Hydrology Fundamentals of Remote Sensing Computational Aspects in Water Resources River Mechanics Geo-informatics Mechanics of Sediment Transport mental Specialization in Automote tment of Mechanical Engineering) zation Core B. Tech. Project-II Automotive Systems Total Credits zation Electives Power Train Design Automotive Structural Design Design of Brake Systems Automotive Prime Movers Mechanical Design of Prime Mover Elements	3 2 2 2 2 2 2 2 2 3 3 ive	0 0 0 0 0 0 0 0 0 0 0	0 : 0 : 12 : 0 : 12 : 0 : 0 : 2 : 2 : 0 : 0 : 14 : 2 : 2 : 0 : 0 : 14 : 2 : 2 : 2 : 0 : 0 : 14 : 2 : 2 : 2 : 0 : 0 : 14 : 2 : 2 : 2 : 2 : 0 : 14 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 :
CVL824 Depare Engine Specializ CVD412 CVL421 CVL422 CVL423 CVP424 Specializ CVL431 CVL432 CVL433 CVL434 CVL435 Depart (Depare Specializ CVD412 CVL441 CVL442 CVL443 CVL758 Specializ CVL763 CVL763 CVL765	Life Cycle Analysis & Design for Environment Itmental Specialization in Geo Beering (Department of Civil Engine Zation Core B.Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics Total Credits Zation Electives (6 Credits) Design of Foundations & Retaining Structures Stability of Slopes FEM in Geotechnical Engineering Geotechnical Design Studio Underground Structures mental Specialization in Structural Entment of Civil Engineering) Zation Core B.Tech. Project Part-II Structural Design Structural Analysis-III Prestressed Concrete & Industrial Structures Solid Mechanics in Structural Engineering Total Credits Zation Electives (6 Credits) Analytical and Numerical Methods for Struct. Engineering Concrete Mechanics	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 ch ng 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 (niii) 1. (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0	3 22 3 2 2 2 rring 3 3 3 3 18 3 3 3 3 18	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385 CVL386 CVP484 CVL485 CVL486 CVL487 Depart (Depar Specializ MCD412 MCL321 MCL322 MCL421 MCL422 MCL721 MCL722 MCL723	Groundwater Water Resources Management Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B. Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology Frequency Analysis in Hydrology Fundamentals of Remote Sensing Computational Aspects in Water Resources River Mechanics Geo-informatics Mechanics of Sediment Transport mental Specialization in Automote tment of Mechanical Engineering) zation Core B. Tech. Project-II Automotive Systems Total Credits zation Electives Power Train Design Automotive Structural Design Design of Brake Systems Automotive Prime Movers	3 2 2 2 2 2 2 2 1 2 2 3 3 3 3 2 2 3 3 3	0 0 0 0 0 0 0 0 0 0 0	0 : 0 : 12 : 0 : 12 : 0 : 0 : 2 : 2 : 0 : 0 : 14 : 2 : 2 : 0 : 0 : 14 : 2 : 2 : 0 : 0 : 0 : 0 : 0 : 0 : 0 : 0
CVL824 Depare Engine Speciali: CVD412 CVL421 CVL422 CVL423 CVL433 CVL434 CVL435 Depart (Depare Speciali: CVD412 CVL441 CVL442 CVL443 CVL445 CVL445 CVL445 CVL446 CVL44 CVL	Life Cycle Analysis & Design for Environment Itmental Specialization in Geo Beering (Department of Civil Engine Zation Core B.Tech. Project Part-II Ground Engineering Rock Engineering Soil Dynamics Environmental Geotechniques and Geosynthetics Total Credits Zation Electives (6 Credits) Design of Foundations & Retaining Structures Stability of Slopes FEM in Geotechnical Engineering Geotechnical Design Studio Underground Structures mental Specialization in Structural Entment of Civil Engineering) Zation Core B.Tech. Project Part-II Structural Design Structural Analysis-III Prestressed Concrete & Industrial Structures Solid Mechanics in Structural Engineering Total Credits Zation Electives (6 Credits) Analytical and Numerical Methods for Struct. Engineering	3	0 ch ng 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 26 3 3 3 3 18 3 2 2 2 2 ring 3 3 3 3 3 18	CVL382 CVL481 CVL482 CVL483 CVD412 Specializ CVL284 CVL383 CVL384 CVL385 CVL386 CVP484 CVL485 CVL486 CVL487 Depart (Depar Specializ MCD412 MCL321 MCL322 MCL421 MCL422 MCL721 MCL722 MCL723 MCL724	Groundwater Water Resources Management Water Resources Management Water Power Engineering Groundwater & Surface-water Pollution B. Tech. Project Part-II Total Credits zation Electives (8 Credits) Fundamentals of Geographic Information Systems Water Resources Systems Urban Hydrology Frequency Analysis in Hydrology Fundamentals of Remote Sensing Computational Aspects in Water Resources River Mechanics Geo-informatics Mechanics of Sediment Transport mental Specialization in Automote tment of Mechanical Engineering) zation Core B. Tech. Project-II Automotive Systems Total Credits zation Electives Power Train Design Automotive Structural Design Design of Brake Systems Automotive Prime Movers Mechanical Design of Prime Mover Elements Vehicle Dynamics	3 2 2 2 2 2 2 2 2 3 3 ive		0 : 2 : 0 : 12 : 2 : 0 : 0 : 2 : 2 : 0 : 0 : 2 : 2 :

Departmental Specialization in Technical and Innovative Textiles (Department of Textile and Fibre Engineering)

Specialization Electives

TXD402	Major Project Part-II	0	0	168	
TXL710	High Performance and Specialty Fibres	3	0	0 3	
TXL719	Functional and Smart Textiles	3	0	0 3	
TXL734	Nonwoven Processes and Products	3	0	0 3	
TXL740	Science & App. of Nanotechnology in Textiles	3	0	0 3	
TXL752	Design of Functional Clothing	3	0	0 3	
TXL773	Medical Textiles	3	0	0 3	
TXL775	Technical Textiles	3	0	0 3	
TXL776	Design & Manuf. of Text. Reinforced Composites	3	0	0 3	
TXL780	Principles of Characterization of	3	0	0 3	
	Functional and Technical Textiles				

Departmental Specialization in Textile Business Management (Department of Textile and Fibre Engineering)

Specialization Electives

MCL756	Supply Chain Management	3	0	0 3
MCL760	Project Management	3	0	0 3
TXD402	Major Project Part-II	0	0	168
TXL381	Costing and its Application in Textiles	3	1	0 4
TXL781	Costing, Project Formulation and Appraisal	3	0	0 3
TXL782	Production and Operations	3	0	0 3
	Management in Textile Industry			
TXL783	Design of Experiments and Statistical Techniques	3	0	0 3
TXV702	Management of Textile Business	1	0	0 1

Departmental Specialization in Appliance Engineering (Department of Electrical Engineering)

Specialization Electives

ELL799 Natural Computing

ELD451	BTP Part-II	0	0	168	
ELL319	Digital Signal Processing	3	0	2 4	
ELL365	Embedded Systems	3	0	0 3	
ELL450	Special Topics in AE-I	3	0	0 3	
ELL754	Permanent Magnet Machines	3	0	0 3	
ELL756	Special Electrical Machines	3	0	0 3	
ELL762	Intelligent Motor Controllers	3	0	0 3	
ELL766	Appliance System	3	0	0 3	
ELL767	Mechatronics	3	0	0 3	
ELV750	Special Modules in AE-I	1	0	0 1	

Departmental Specialization in Cognitive and Intelligent Systems (Department of Electrical Engg.) Specialization Electives

ELD457	BTP Part-II	0	0	16	8	
ELL409	Machine Intelligence and Learning	3	0	2	4	
ELL457	Special Topics in C&IS-I	3	0	0	3	
ELL704	Advanced Robotics	3	0	0	3	
ELL707	Systems Biology	3	0	0	3	
ELL715	Digital Image Processing	3	0	2	4	
ELL741	Neuromorphic Engineering	3	0	0	3	
ELL762	Intelligent Motor Controllers	3	0	0	3	
ELL779	Forecasting Techniques for Power Systems	3	0	0	3	
ELL784	Introduction to Machine Learning	3	0	0	3	
ELL786	Multimedia Systems	3	0	0	3	
ELL788	Computational Cognition and Perception	3	0	0	3	
ELL789	Intelligent Systems	3	0	0	3	
ELL791	Neural Systems and Learning Machines	3	0	2	4	
ELL793	Computer Vision	3	0	0	3	
ELL794	Human-Computer Interface	3	0	0	3	
ELL795	Swarm Intelligence	3	0	0	3	
ELL796	Signals and Systems in Biology	3	0	0	3	
ELL798	Agent Technology	3	0	0	3	

ELL880	Special Topics in Computers-I	3	0	0	3
ELL881	Special Topics in Computers-II	3	0	0	3
ELL884	Deep Learning for Natural Language	3	0	0	3
	Processing				
ELL888	Advanced Machine Learning	3	0	0	3
ELL890	Computational Neuroscience	3	0	0	3
ELL891	Advances in Deep Learning	3	0	0	3
ELL893	Cyber-Physical Systems	3	0	0	3
ELV780	Special Modules in Computers	1	0	0	1
ELV781	Special Module in Information Processing-I	1	0	0	1
ELV832	Special Module in Machine Learning	1	0	0	1

Departmental Specialization in Communication Systems and Networking (Dept. of Electrical Engg.)

Specialization Electives

ELD458	BTP Part-II	0	0	16	8	
ELL411	Digital Communications	3	0	2	4	
ELL458	Special Topics in CS&N-I	3	0	0	3	
ELL713	Microwave theory and techniques	3	0	0	3	
ELL714	Basic Information Theory	3	0	0	3	
ELL716	Telecom Switiching and Transmission	3	0	0	3	
ELL717	Optical Communication Systems	3	0	0	3	
ELL723	Broadband Communication Systems	3	0	0	3	
ELL725	Wireless Communications	3	0	0	3	
ELL785	Computer Communication Networks	3	0	0	3	
ELV720	Special Modules in CS&N-I	1	0	0	1	

Departmental Specialization in Electric Transportation (Department of Electrical Engineering)

Specialization Electives

BTP Part-II	0	0	16	8	
DSP Based Control of Drives	3	0	2	4	
Special Topics in AE–I	3	0	0	3	
Special Topics in ET-I	3	0	0	3	
Modeling of Electrical Machines	3	0	0	3	
Permanent Magnet Machines	3	0	0	3	
Variable Reluctance Machines	3	0	0	3	
Electric Vehicles	3	0	0	3	
Special Modules in ET-I	1	0	0	1	
	BTP Part-II DSP Based Control of Drives Special Topics in AE–I Special Topics in ET–I Modeling of Electrical Machines Permanent Magnet Machines Variable Reluctance Machines Electric Vehicles Special Modules in ET–I	DSP Based Control of Drives 3 Special Topics in AE-I 3 Special Topics in ET-I 3 Modeling of Electrical Machines 3 Permanent Magnet Machines 3 Variable Reluctance Machines 3 Electric Vehicles 3	DSP Based Control of Drives 3 0 Special Topics in AE-I 3 0 Special Topics in ET-I 3 0 Modeling of Electrical Machines 3 0 Permanent Magnet Machines 3 0 Variable Reluctance Machines 3 0 Electric Vehicles 3 0	DSP Based Control of Drives Special Topics in AE-I Special Topics in ET-I Modeling of Electrical Machines Permanent Magnet Machines Variable Reluctance Machines Electric Vehicles 3 0 2 3 0 0 2 0 0 3 0 0 5 0 0 5 0 0 6 0 0 7 0 0 8 0 0	DSP Based Control of Drives 3 0 2 4 Special Topics in AE-I 3 0 0 3 Special Topics in ET-I 3 0 0 3 Modeling of Electrical Machines 3 0 0 3 Permanent Magnet Machines 3 0 0 3 Variable Reluctance Machines 3 0 0 3 Electric Vehicles 3 0 0 3

Departmental Specialization in Energy-Efficient Technologies (Department of Electrical Engineering)

Specialization Electives

ELD453	BTP Part-II	0	0	16	8
ELL408	Low Power Circuit Design	3	0	0	3
ELL453	Special Topics in EET-I	3	0	0	3
ELL721	Introduction to Telecommunication Systems	3	0	0	3
ELL743	Photovoltaics	3	0	0	3
ELL757	Energy Efficient Motors	3	0	0	3
ELL763	Advanced Electrical Drives	3	0	0	3
ELL765	Smart Grid Technology	3	0	0	3
ELL797	Energy Efficient Computing	3	0	0	3
ELV752	Special Modules in EET-I	1	0	0	1

Departmental Specialization in Information Processing (Department of Electrical Engineering)

Specialization Electives

ELD459	BTP Part-II	0	0	16	8	
ELL459	Special Topics in IP-I	3	0	0	3	
ELL460	Special Topics in IP-II	3	0	0	3	
ELL714	Basic Information Theory	3	0	0	3	
ELL715	Digital Image Processing	3	0	2	4	
ELL718	Statistical Signal Processing	3	0	0	3	
ELL719	Detection and Estimation Theory	3	0	0	3	
ELL720	Advanced Digital Signal Processing	3	0	0	3	
ELL724	Multichannel Signal Processing	3	0	0	3	
ELL784	Introduction to Machine Learning	3	0	0	3	

3 0 0 3

ELL786	Multimedia Systems	3	0	0	3	
ELL793	Computer Vision	3	0	0	3	
ELL794	Human-Computer Interface	3	0	0	3	
ELL884	Deep Learning for Natural Language	3	0	0	3	
	Processing					
ELV781	Special Modules in IP-I	1	0	0	1	
CRL707	Human and Machine Speech Communications	3	0	0	3	

Departmental Specialization in Nano-electronic and Photonic Systems (Department of Electrical Engg.)

Specialization Electives

ELD456	BTP Part-II	0	0	16	8	
ELL456	Special Topics in NE&PS-I	3	0	0	3	
ELL730	IC Technology	3	0	0	3	
ELL732	Micro and Nanoelectronics	3	0	0	3	
ELL737	Flexible Electronics	3	0	0	3	
ELL738	Micro and Nano Photonics	3	0	0	3	
ELL739	Advanced Semiconductor Devices	3	0	0	3	
ELL740	Compact Modeling of Semiconductor Devices	3	0	2	4	
ELP740	On-wafer Device Characterization Laboratory	0	0	6	3	
ELL741	Neuromorphic Engineering	3	0	0	3	
ELL742	Introduction to MEMS Design	3	0	0	3	
ELL743	Photovoltaics	3	0	0	3	
ELL744	Electronic and Photonic Nanomaterials	3	0	0	3	
ELL745	Quantum Electronics	3	0	0	3	
ELV731	Special Modules in NE&PS-I	1	0	0	1	

Departmental Specialization in Smart Grid and Renewable Energy (Department of Electrical Engg.)

Specialization Electives

ELD452	BTP Part-II	0	0	16	8	
ELL402	Computer Communications	3	0	0	3	
ELL417	Renewable Energy Systems	3	0	0	3	
ELL765	Smart Grid Technology	3	0	0	3	
ELL770	Power System Analysis	3	0	0	3	
ELL771	Special Topics in SG&RE-I	3	0	0	3	
ELL772	Planning and Operation of Smart Grid	3	0	0	3	
ELL773	High Voltage DC Transmission	3	0	0	3	
ELL774	Flexible AC Transmission Systems	3	0	0	3	
ELL775	Power System Dynamics	3	0	0	3	
ELL789	Intelligent Systems	3	0	0	3	
ELV451	Special Modules in SG&RE-I	1	0	0	1	

Departmental Specialization in Systems and Control (Department of Electrical Engineering)

Specialization Electives

ELD450	BTP Part-II	0	0	16	8	
ELL436	Digital Control	3	0	0	3	
ELL700	Linear Systems Theory	3	0	0	3	
ELL702	Nonlinear Systems	3	0	0	3	
ELL703	Optimal Control Theory	3	0	0	3	
ELL704	Advanced Robotics	3	0	0	3	
ELL705	Stochastic Filtering and Identification	3	0	0	3	
ELL707	Systems Biology	3	0	0	3	
ELL708	Selected Topics in Systems and Control	3	0	0	3	
ELL762	Intelligent Motor Controllers	3	0	0	3	
ELV700	Special Modules in Systems and Control	1	0	0	1	

Departmental Specialization in VLSI and Embedded Systems (Department of Electrical Engineering)

Specialization Electives

ELD455	BTP Part-II	0 0 168
ELL365	Embedded Systems	3 0 0 3
ELL455	Special Topics in V&ES-I	3 0 0 3
ELL720	Advanced Digital Signal Processing	3 0 0 3

ELL730	IC Technology	3	0	0	3
ELL731	Mixed Signal Circuit Design	3	0	0	3
ELL733	Digital ASIC Design	3	0	2	4
ELL734	MOS VLSI Design	3	0	0	3
ELL735	Analog Integrated Circuits	3	0	0	3
ELL736	Solid State Imaging Sensors	3	0	0	3
ELL740	Compact Modeling of Semiconductor Devices	3	0	2	4
ELP740	On-wafer Device Characterization Laboratory	0	0	6	3
ELL741	Neuromorphic Engineering	3	0	0	3
ELL747	Active and Passive Filter Design	3	0	0	3
ELL748	System-on-Chip Design and Test	3	0	0	3
ELL749	Semiconductor Memory Design	3	0	0	3
ELL833	CMOS RF IC Design	3	0	0	3
ELV730	Special Modules in V&ES-I	1	0	0	1

Departmental Specialization in Polymeric Materials (Department of Materials Science and Engineering)

Specialization Core

MLL342	Physical Chemistry of Polymers	3	0	0	3
MLL343	Polymer and Elastomer Technology	3	0	0	3
MLL344	Rheology and Processing of Polymers	3	0	2	4
	Total Credits				10

Specialization Electives

MLL345	Polymer Matrix Composites	2	0	0 2	
MLL341	Engineering Biomaterials	2	0	0 2	
MLD413	Major Project in Polymeric Materials	0	0	126	
PTL711	Engineering Plastics and Specialty Polymers	3	0	0 3	
MLL729	Polymer Blends and Composites	3	0	0 3	
MLL741	Biodegradable Polymeric Materials	3	0	0 3	
MLL733	Polymer Reaction Engineering	3	0	0 3	
MLL735	Polymer Product and Mould Design	2	0	2 3	

Departmental Specialization in Metallurgy (Department of Materials Science and Engineering)

Specialization Core

MLL361	Iron and Steel Making	2	0	0	2
MLP362	Metallography Lab	0	0	4	2
MLL363	Metal Casting Technology	2	0	2	3
MLL364	Welding Metallurgy	2	0	2	3
	Total Credits				10

Specialization Electives

MLL345	Polymer Matrix Composites	2	0	0 2	
MLD414	Major Project in Metallurgy	0	0	126	;
MLL365	Powder Metallurgy	3	0	0 3	,
MLP366	Heat treatment and Surface Engineering	2	0	2 3	,
MLL720	Diffusion and Kinetics	3	0	0 3	,
MLL732	Porous Materials	3	0	0 3	,
MLL734	Texture and Grain Boundary Engineering	3	0	0 3	,
	in Metals and Alloys				
MLL736	Tribology and Surface Engineering	3	0	0 3	,
	of Materials				
MLL713	Phase transformations	3	0	0 3	,
MLL714	Fracture Mechanics	3	0	0 3	,
MLL701	Structure and Characterization of Materials	3	0	0 3	,
MLL715	Advanced Engineering Materials	3	0	0 3	,
MLL716	Engineering Failure Analysis and Prevention	3	0	0 3	,
MLP704	Materials Processing and Characterization Lab	1	1	4 4	
MLV705	Special topics in Materials	1	0	0 1	
MCL780	Casting Technology	3	0	2 4	
MCL778	Design and Metallurgy of Welded Joints	3	0	2 4	
APL756	Multiscale Modelling of Crystalline Materials	3	0	2 4	
MCL791	Processing and Mechanics of Composite	3	0	2 4	
	Materials				
ITL717	Corrosion and its Control	3	0	0 3	,
ITL703	Fundamentals of Tribology	3	0	2 4	

4. NON-GRADED CORE FOR UNDERGRADUATE STUDENTS

In order to synergize formal academics with informal outside-class-room learning experience, mechanisms for earning non-graded units have been introduced in the undergraduate curriculum in 2013. In order to earn these units, a student will need to involve himself/herself in activities beyond the classroom engagements. For earning 1 unit a student will typically need to work for 2-3 hours per week (28-42 hours per semester) in on-campus activities. In case of project/design/internship activities, the student engagement expected is typically 20 days of work per non-graded unit. A student would not be allowed to earn credits as well as non-graded units for the same effort. It is important that the efforts towards earning non-graded units should be distinct from that spent on earning credits. Also, the effort for earning different components of the non-graded units should be distinct, i.e., the same effort would not be evaluated for more than one non-graded component.

Non-graded core of the undergraduate curriculum comprises of the following components:

S.No.	Components	Minimum NGUs for Graduation	Maximum Countable Towards Total of 11 NGUs
1	Introduction to Engineering and Programme	1	1
2	Language and Writing Skills	2	2
3	Communication Skills/Seminar	1	1
4	NCC/NSO/NSS	1	2
5	Professional Ethics and Social Responsibility	1	2
6	Design and Practical Experience	3	5
	Total		11

These 11 units form a compulsory graduation requirement for all the undergraduate (B.Tech. as well as Dual degree) programmes. A student will need to earn these 11 units over the duration of the programme with special consideration and requirements for each component as detailed in the following sections. Each component would be constituted by one or more non-graded courses, and a student will need to get an 'S' grade in these courses to earn the respective non-graded unit(s). Incomplete status in such courses will be indicated by a 'Z' grade. The student would be required either to repeat the course/activity or continue with the project/internship until such time that the evaluating faculty member/committee is satisfied with the effort to award an 'S' grade. No partial/ fractional units can be awarded. For example, if a particular activity carries 2 units, a student cannot be awarded 1 unit or fractional units for incomplete work, but would need to repeat / complete the work to the satisfaction of the evaluating faculty member/committee to become eligible for award of 2 units.

For components 3-6 in the above table, a special portal called the NGU portal is used for necessary approvals and posting of "S" grades. This portal can be accessed at https://ngu.iitd.ac.in/index

4.1 Introduction to Engineering and Programme

This non-graded component is aimed at orienting and exciting students in the subject of engineering in general and their respective disciplines in particular. The objectives of the component are:

- Exposing students to "Engineering" as a profession that creates wealth for nations, and as a vehicle for economic growth.
- Exposing students to Science/Engineering as a medium through which one can address problems facing the society including some of the grand challenges.
- Excite students by enabling them to appreciate the role and enormous impact of research in science/ engineering on our day to day lives.
- Enlighten students about the various career options available to them.
- Make students aware of the issues involved in engineering a product, and help them appreciate why
 the process of design and innovation leading to products and systems is both personally satisfying
 and professionally rewarding.
- Excite students about potential role models and successful alumni in engineering profession.
- Motivate students to take up some co-curricular activities on their own during their stay in the Institute.

The activities to realize the above-mentioned objectives as part of this non-graded component include:

- Understanding engineering through product dissection and reverse engineering. (The products given to students to dissect could be physical in form or in the form of videos).
- Screening of videos that bring out the strong relation between science/engineering and societal needs.
- Conducting design and innovation contests among students.
- Solving science/engineering design thinking exercises in the class.
- Lectures by successful industrialists, alumni and entrepreneurs about their journey.
- Exposure to successful research cases from the Institute and the impact of the same.
- Exposure to successful products/innovations from the Institute which have reached people/industry/ society.
- Some interesting demonstrations in laboratories.
- · Hands-on exercises in laboratories.
- · Industry visits.
- Visits to on-going exhibitions in the city.
- Do-it-yourself projects in teams.
- Lectures by faculty, visitors, alumni on some exciting topics.

This non-graded unit is administered in the form of one non-graded course of one unit:

 NIN100 Introduction to Engineering and Programme in the first semester of the undergraduate programme.

The course coordinator of NIN100 would be identified by the Dean Academics. Apart from the main coordinator, each department offering a UG programme, will identify a departmental coordinator for this course. The departmental coordinator will engage with students of their respective departments and will cover 30-35% of the course.

It is necessary to get a satisfactory (S) grade in this course for completing the degree requirements. Attendance would be one of the main criteria for evaluation. Apart from this, active participation and quiz-based evaluation etc. would also be used as a basis to decide 'S' or 'Z' grade. The grades of NIN100 would be moderated by Dean Academics

4.2 Language and Writing Skills

All students are required to participate in Task-Based language classes in the first two semesters. The language needs of a particular batch of the students will be assessed through an online test before the classes begin in the first semester. Then the exercises for different classes will be tailored to the language needs of those students. In general, these exercises are designed to enhance linguistic capabilities in comprehension, both reading and listening, as well as improve the ability to structure and compose ideas in spoken and written communication. Many of them will be structured in the form of competitive games. Wherever necessary principles of English Grammar will be discussed along with the nuances of technical writing. With respect to its content, some of the textual material and lectures—will focus on the relationship between Engineering, Humanities and Social Sciences.

The two semesters of Language and Writing Skills is administered in the form of two courses, each of one unit: NLN100 Language and Writing Skills—I in the first semester and NLN101 Language and Writing Skills—II in the second semester. These courses are coordinated by faculty from the Department of Humanities and Social Sciences and an S grade in both NLN100 and NLN101 is generally a prerequisite to register for most undergraduate courses offered by the department of HSS. Assessment of a student towards S grade in each of these courses would typically be on the basis of attendance, participation and performance in the exercises. A student could also be prescribed self-learning exercises or additional practice sessions during vacations as requirement for securing S grade. Student's involvement, during regular semester, would typically be two hours per week. The grades of these courses are moderated by the Dean Academics.

4.3 NCC/ NSO/ NSS

A student is required to choose one of NCC/NSO/NSS during the first semester, and complete the requirements preferably within the first four registered semesters. Students will be required to earn a minimum of 1 non-graded unit from one of these activities, by completing at least 40 hours of work. Students can earn upto 2 units by putting in 80 hours of work. The faculty coordinators of NCC / NSO / NSS decide and announce the policies on earning non-graded units in these activities from time to time.

4.4 Professional Ethics and Social Responsibility

There is increasing consensus worldwide that engineering ethics should be incorporated into the engineering curriculum to provide students with an exposure to the kind of professional ethical dilemmas they might face on an individual basis as well as in the larger context of ethical aspects of technology development. Workshops, discussion/debates, use of theatre-in-education, case-study based approaches, etc. are often used for illustration and discussion of engineering ethics. Such inputs could be provided in a stand-alone manner, integrated into existing courses or both. The objective of this non-graded component is to sensitize students about Professional Ethics and Social Responsibility (PESR) through a combination of the above-mentioned approaches, supplemented by discussion fora and supplementary materials, to help students to become ethical professionals. A student is required to complete minimum of 1 non-graded unit in this component through activities divided into 3 core courses. The courses NEN110 and NEN111 together correspond to 0.5 non-graded unit and the course NEN300 also corresponds to 0.5 unit. Besides, the students can earn an additional unit through one of the two alternatives NEN212/NEN213 as discussed below. Thus, the courses under PESR are:

- i) NEN110 Professional Ethics and Social Responsibility I (core)
- ii) NEN111 Professional Ethics and Social Responsibility II (core)
- iii) One of the following two courses: (optional)
 - a. NEN212 PESR Workshops
 - b. NEN213 PESR Projects
- iv) NEN300 Case Studies in Professional Ethics (core)

Core Requirements

NEN110 and NEN111 are compulsory for all students, and these courses involve interactive sessions of a group of students with a resource person in the first and second semesters respectively. The student will earn 0.5 unit by getting S grade in both these courses.

In NEN300 Case Studies in Professional Ethics, every student will work on at least two case studies related to professional ethics, followed by discussions on the same, moderated by a resource person. The details on how to select the case studies and the mode of discussions and their evaluation would be decided by the concerned resource person. The student will earn 0.5 unit by getting an S grade in this course.

Activities for Additional NGU

The students can choose to earn 1 more NGU under PESR by participating in any one out of a large variety of activities relevant to the core themes of PESR. With the considerable amount of flexibility allowed in the choice of activities, each student desirous of earning this unit should be able to identify an activity of interest to him /her under the purview of PESR. These activities have been divided into two broad categories, viz., (a) PESR workshops (b) PESR projects, each of which corresponds to a separate course number NEN212 and NEN213 respectively. After a student has got 'S' grades in NEN110 and NEN111, the student can register for NEN212/NEN213. 'S' grade in any of these two courses will get the student 1 NGU.

NEN212 PESR Workshops

Under NEN212 (PESR Workshops), students can participate in one workshop of 5 days duration if the workshop is held in person. These workshops are generally organized on campus by NRCVEE soon after major examinations at the end of every semester. Alternatively, online workshops can be held with about 40 hours of engagement through 2-3 hour sessions during the semester or during vacation period. These workshops are organized by NRCVEE and would be conducted by resource persons from within or outside the Institute. These workshops could be pertaining to any of the themes relevant to PESR and the in-person ones could be held during mid-semester break/summer/winter vacation. The students must follow the procedure announced by the faculty coordinator to register for a workshop. The 'S' grade for attending a workshop will be awarded only if the student attends all sessions of the workshop on all the days for its full duration.

NEN213 PESR Projects

Under NEN213 (PESR Projects), the students can take up projects under the guidance of one or more faculty members to make positive contribution to campus life. This could include promoting wholesome practices on campus such as:

- ethical practices particularly among students through specially directed efforts;
- peer assistance for the students in need of help academically or otherwise;
- sustainable practices on campus like resource conservation, waste management, use of renewable resources and the like;
- working on technology for a social cause etc.

This work could be done during a semester or mid-semester break or summer/winter vacation. The student must submit a project proposal on the NGU portal, with explicit statement of deliverables, through his/her faculty supervisor(s), for approval by the PESR coordinator. If the work is taken up in a team, each student's share of work must be defined in the proposal. It is expected that each student puts in at least 40 hours of effort in the project. On completion of the project, the students should submit a completion request online along with a report of the work done, again through the faculty supervisor, who should certify that each student has completed his/her share of the deliverables and each student has put in at least 40 hours of work into the project.

If a student gets selected in one of the nation building initiatives organized by reputed organizations, the student can identify a faculty supervisor who can be informed of the work done as part of these initiatives. On successful completion of the work, the student can apply on the NGU portal for earning NEN213 units through the faculty supervisor, who can certify the completion of the concerned activity.

Table 4.2 summarizes the requirements of the non-graded component on Professional Ethics and Social Responsibility.

Table 4.2 : Summary of Requirements of the Non-Graded Component on Professional Ethics and Social Responsibility

S. No.	Course	Period of Activity	Description	Requirement for 'S' grade	No. of units
Α	Core Requireme	nt			
1.	NEN110 Professional Ethics and Social Responsibility–I	1 st Semester	3-4 sessions of 2 hours each with a resource person. Theme of the sessions to be announced by the faculty coordinator	Participation in all the sessions held	0.25 (both
2.	NEN111 Professional Ethics and Social Responsibility–II	2 nd Semester	3-4 sessions of 2 hours with a resource person. Theme of the sessions to be announced by the faculty coordinator	Participation in all the sessions held	courses together)
3.	NEN300 Case Studies in Professional Ethics	After 6 th semester: during vacation or 7 th /8 th semesters	Work on two case studies on professional ethics; participate in discussions moderated by a resource person.	Participation in all the sessions held along with presentation of case studies	0.5
В	Practical Activities for Additional NGU				
4.	NEN212: PESR Workshops	If in-person: Mid- semester breaks/ summer/ winter vacations. If online: can be held during the semester as well	Participation in intense ON-CAMPUS workshops approved by Dean Academics, of 5 days duration if in-person and 40 hours duration if online conducted by professional resource persons, with special emphasis on themes related to PESR.	'S' grade to be awarded only for attending the workshop for full duration.	1

5.	NEN213: PESR Projects	Summer/ winter vacation /mid- semester break or during a semester.	Taking up on-campus projects under the guidance of a faculty mentor, related to any of the topics relevant to PESR, such as (but not limited to) A. Promoting ethical practices on campus in various spheres particularly related to student life on campus. B. Strengthening the existing systems and designing and implementing new ones for an active student community participation in addressing the academic as well as other problems of student community.	Prior approval of project proposal by PESR coordinator explicitly specifying deliverables and work share of each student in case of group projects; Completion of the project deliverables identified in the proposal - It must involve at least 40 hours of work by each student along with submission of a report on the NGU portal.	1
			C. Developing socially relevant technologies D. Promoting Sustainable Practices in hostels, academic area, residential areas etc., involving activities pertaining to conservation of water/electricity/paper/other resources, waste management, promoting use of bicycles, etc.		

4.5 Communication Skills / Seminar

The objective of this non-graded component is to provide the students with an opportunity to develop their skills in preparing write-ups, making presentations, and reading/listening to others' write-ups/presentations. A student would be required to earn 1 non-graded unit under this component between 5th and 8th semesters through any of the following:

- (i) Attending one of the topic specific seminar courses (XXQ301, XXQ302, etc.) introduced by the parent Department of a student (for example ELQ301 – Seminar on Embedded Systems – 1 unit) or attending a seminar course (XYQ301, XYQ302 etc.) offered by any other Department/Centre/School. These courses would be non-credit electives, offered in each semester. These seminar sessions would be held for two hours per week. Many such courses could run in parallel.
- (ii) Participating in optional seminars which may be part of regular courses; for example regular 'L' courses can have an optional seminar component (e.g. ELL711 Optical Communications can have optional seminar component of 1 unit). This would, like any other seminar course, need to have seminar sessions of 2 hours duration every week for a whole semester. In such a case, a student should register for XXQ30y, and the course coordinator would send recommendations for 'S' grades to the Dean Academics, duly moderated by the Moderation Committee of the concerned Department/Centre/School.
- (iii) By participating in special workshops on Communication Skills approved by Dean Academics. The faculty coordinator in charge of the workshop would submit a list of students who completed the activity with 100% attendance in all sessions on all days of the workshop for award of 'S' grade in NQN301.
- (iv) By submitting documentary evidence of excellence in debating and/or writing as certified by faculty in-charge of these activities, to the Dean, Academics. In all such cases, the student should submit documentary evidence online, as detailed below:
 - A student who wins first, second or third position in any event/competition conducted at inter-hostel level, by BRCA or by BSP or by BSW would qualify for this option. The event/competition must

be either a debate/declamation/extempore. Since many such events do not have certificates issued, the student must submit a letter signed by the warden or the president of the respective board (in case of BRCA, president of the club would also suffice) stating the date, time, venue of the event/competition along with the number of participants and position secured. In case number of participants is less than 20, the event shall not be counted.

- A student who performs as a compere for any of the Institute functions (only those listed in the Institute calendar). The student will need to produce a signed letter from the faculty in-charge of the Institute function stating the student's role as compere. The letter must include the date, time, venue and duration of the event. Any event lasting less than 1 hour will not be counted.
- A student winning a technical paper presentation award during TRYST will need to submit a copy
 of the certificate and the abstract of the paper presented. Technical publications in Journals or
 Conferences would also be considered, provided (i) the number of authors of the paper does not
 exceed 2 and (ii) the faculty member supervising the work certifies that the paper was written by
 the concerned student.

A minimum of three such documents certified by the faculty in charge of the Board/Club/Activity as mentioned above would qualify a student to earn one unit of Communication Skills/Seminar. In each case, before recommending the award of non-graded units for the above activities, the faculty in charge of the Board/Club/Activity should keep in mind that a student engagement/effort (including preparations and the actual event) of about 40 hours would be necessary for the award of one non-graded unit.

In cases of options (i), and (ii) above, the faculty member in charge of the course should ensure that the student has 100% attendance in the seminars and has done a satisfactory task of his/her contribution to the course: the write-up, presentation, etc. before awarding an 'S' grade. These grades would be moderated by the respective Department/Centre/School. In case of unavoidable absence of up to 3 seminar sessions, appropriate compensation mechanism should be announced by the faculty member at the beginning of the course. For absence beyond 3 sessions, S grade cannot be awarded.

An Institute level Coordinator for Communication Skills/Seminar, appointed by the Dean Academics, would serve as the course coordinator of NQN301. An Institute level committee would moderate the non-graded units for Communication Skills / Seminar recommended for activities other than the courses XXQ30y.

4.6 Design / Practical Experience

The objective of this non-graded component is to give opportunities to students to learn in an informal setting. This mode of learning, is often more effective than conventional lectures / laboratory work. Second and even more important objective of this non-graded component is to inculcate design thinking among students and facilitate them to gain some design immersion experience. Design / Practical Experience (DPE) component can promote learning by doing which does two important things: Firstly, it allows students to immerse themselves in the environment in which work is to be done, so that they can understand the values and expectations of the target beneficiaries. Secondly it enables a fresh look at problems, not only at the ways of defining them, but also at the ways to solve those including skill-sets that are required to address them. This approach signifies a shift from problem based learning (acquisition of knowledge) to project based learning (application of knowledge), in which the projects are grounded in problems outside the classrooms and laboratories, in everyday scenarios. Thus, DPE bridges division between the curricular and the co-curricular components, and encourages the curiosity and involvement that arises from total absorption in a subject of interest.

As a part of this requirement, every student is expected to earn a minimum of three non-graded units of DPE to complete the degree requirements. To earn one unit of DPE, a student is expected to put in 28-42 hours of effort or 20 working days depending on the type of activity. To earn two units of DPE, a student needs to put in 56-84 hours of effort or 40 working days depending on the nature of activity. These units can be earned in multiple ways during the semester as well as during vacation and mid-semester breaks:

- Courses with design focus without any regular graded credits, which are designated to give design / practical experience units.
- Courses (core or elective) with optional design/practical experience component.
- Summer/semester internships by students in R&D/Industry/Universities in India or abroad.

- Summer/winter/semester projects under the guidance of faculty of the Institute.
- Participation in design/innovation projects by Innovation Center/CAIC, etc.
- One time activity such as design/practical experience workshop/course/event during semester/ vacation/mid-semester breaks, etc.

DPE activities are not restricted to design of physical products but can also include system level design and experience. For example a team of students who under the supervision of faculty in collaboration with an NGO, would like to design a new financial inclusion system for marginalized section of population too can earn design/practical experience units.

The operational modalities of implementing the above-mentioned activities so that students can earn the required non-graded units, are presented in the following paragraphs.

4.6.1 Management of Non-graded DPE Units

Each Department offering UG programme(s) would constitute a DPE Committee with a Departmental DPE Coordinator to manage the non-graded Design/Practical Experience units.

- a) The Departmental DPE Committee would coordinate with Office of Career Services (OCS) to identify and vet industries for internships.
- b) The committee would also examine other types of internships (in Universities, research laboratories, start-ups etc.) requested by students and approve or deny as per a policy defined by the Department.
- c) Students of the Department desirous of earning non-graded DPE units through any other mechanism listed above should request permission of this committee before embarking on the activity. The committee would also decide on the award of non-graded DPE units for all such activities for the students of the Department through appropriate evaluation mechanisms.
- d) The committee would be responsible to evaluate the design activities carried out by the students during internships and recommending award of the non-graded DPE units, or continuation of the internship activity for more days to become eligible for the units, as per the efforts of the students during the internship. DPE Committee will moderate all Design units awarded to students of that Department. The Departmental DPE Coordinator also has responsibility of ensuring that units earned by heterogeneous activities meet the requirements in terms of learning efforts and experience.
- e) The Dean Academics will appoint an Institute DPE Coordinator for Design / Practical Experience units.
- f) Departmental DPE Coordinators, Institute DPE Coordinator and Associate Dean Academics-Curriculum together will form an institute level committee to moderate the non-graded units awarded under interdisciplinary work including the activities carried out by students in Departments / Centers / Schools not offering UG programmes. This committee would also review and modify policies as well as modalities for administering DPE units.

4.6.2 Activities Covered Under Design/Practical Experience

4.6.2.1 Specialized Courses Related to Design/Practical Experience (Maximum 2 Units)

Departments / Centres / Schools may offer a basket of courses that will not have any credits associated with them but will have only Design / Practical Experience units linked to them. In other words, on successful completion of such courses the students will earn only DPE units but no graded credits. These courses offered by Departments / Centers / Schools can be of one unit (28-42 hours of student effort) or two units (56-84 hours of student effort). Faculty offering these courses will award these units on successful completion of the course requirements, and the same would be moderated by the Departmental Committee for DPE in case of Departments offering undergraduate programmes. For other Departments / Centres / Schools, the moderation would be done by the Institute level DPE committee.

4.6.2.2 Semester/Summer/Winter Projects Under the Guidance of Institute Faculty (Maximum 2 Units)

Some of the co-curricular activities in the Institute that pertain to team based product building such as Robotics, Automobile, IGEM, Aero-modelling etc. can also be considered for earning DPE units. Students who successfully complete SURA/DISA projects will also be eligible for DPE units. Besides, students may also opt for working on

semester / summer / winter projects involving design/practical experience activity under the guidance of faculty of the institute. In order to be evaluated for DPE Units in such cases, a student should register for XXD35y Minor Design Project floated by the parent Department XX of the student. In case the project is interdisciplinary or it is offered by faculty of other Departments / Centres / Schools, the faculty supervisor of the project may advise the students to register for NDN35y Minor Design Project. In either case, the project would be evaluated by the faculty supervisor.

The courses XXD351 – XXD355 would be Minor Design Projects with 1 non-graded DPE unit, and XXD356 – XXD358 would be Minor Design Projects with 2 non-graded units each. Courses NDN351 – 358 would also follow a similar definition.

4.6.2.3 Regular Courses with Optional Design/Practical Experience Component (Maximum 2 Units)

Course coordinators of regular core and elective courses can also offer optional design component in their courses. A proposal for this should be sent to the Departmental DPE committee prior to the commencement of the course by the Course Coordinator. This would be notified to students by the Departmental DPE committee and also announced to the students by the course coordinator. Successful completion of the course will give graded credits to students and at the same time they will be eligible for earning (1 or 2) design units if they successfully complete the optional DPE component. The course coordinator will recommend these DPE units on successful completion of the assigned work. This would be moderated by the Departmental Committee for DPE. In case the course is offered by Departments / Centres / Schools which do not offer a UG programme, the notification prior to beginning of the course and moderation after the end of the course would be done by the Institute level DPE committee. In order to be evaluated for DPE Units, a student should register for XXD35y Minor Design Project or NDN35y Minor Design Project as the case may be.

4.6.2.4 Summer Internships (Maximum 2 Units)

Students can undertake a minimum of 40 working days of internship to earn two design practical experience units during summer vacations in Industry, R&D institutions or Universities in India or abroad. This cannot be earned in parts. For example, 1 NGU cannot be claimed for 20 working days of internship. This would be administered by the Departmental Committee for DPE with the help of the Office of Carrer Services (OCS). Students are required to get approval for taking up internship in the concerned Institute through the NGU portal prior to proceeding for the internship if they wish to claim NGU for the internship. The Departmental DPE Committee would also be responsible for appointing a faculty supervisor for the internship. Students can proceed with the internship after the Departmental Committee for DPE approves the same. Design units for the internship would be awarded by the Departmental Committee after evaluation at the end of internship period. Rules governing administration of internships are given in section 4.6.3. In case an internship pertains to areas of expertise outside those of the parent Department, the DPE Committee may co-opt faculty members from other Departments / Centres / Schools for evaluating / supervising such internships.

4.6.2.5 One-Semester Internship (Maximum 5 Units)

Students can opt for one semester internship in Industry, R&D institutions or Universities in India or abroad, for a minimum of 100 working days, by appropriately planning for completion of credit requirements for the degree. The student can also opt for a break in coursework for a semester to initiate or work for his / her start up. These are the only two activities upon successful completion of which students would be eligible for 5 DPE units. It is mandatory that student's work during the one-semester internship is supervised by two mentors, one from the institute (appointed by the DPE Committee of the student's Department) and another from the host organization. In case of semester break for a start-up, students will work under the mentorship of a faculty member of the Institute. Students desiring to opt for one semester internship or semester break for start-up as mentioned above are required to plan well in advance and submit a project proposal in consultation with their supervisors (in case of internship) or faculty mentor (in case of start-ups). Students can proceed with the internship / startup activity only after the Departmental Committee for DPE approves the same. DPE units for the activity would be awarded by the Departmental DPE Committee after evaluation at the end of the internship / startup period. In case an internship / startup pertains to areas of expertise outside those of the parent Department, the DPE Committee may co-opt faculty members from other Departments / Centres / Schools for evaluating / supervising such activities. Details of the procedure are given in section 8.6.3 on internships.

A semester in which a student earns DPE units through semester-long internship or start-up as discussed above would be counted as a registered semester for graduation requirements. In case the DPE committee does not approve the award of 5 units for such activity, the semester would not be counted as a registered semester.

4.6.2.6 One Time Design/Practical Experience Module (1 Unit)

One time DPE modules can be offered by Institute faculty as well as working professionals who would like to engage students in a workshop/course related to design/practical experience. A proposal for such a module should be sent by faculty member coordinating the course through the concerned Department/Centre/School to the Institute DPE Committee for approval. These modules can be typically of 28-42 hours duration, and may be offered during mid-semester breaks, winter/summer vacations and even during non-class hours in the semester.

Table 4.3 summarizes the information presented in section 4.6.2. Detailed rules pertaining to internships and their administration are given in section 4.6.3.

Table 4.3 : Implementation and Evaluation Plan for Design/Practical Experience Units

Activity	Norms for the Activity	Criteria for awarding Units	No. of Units	
,	, , , , , , , , , , , , , , , , , , , ,		Min	Max
Courses with design focus (which are primarily design courses or have significant design component)	Courses offered as per Institute procedure	Registration by the student in the respective course; Evaluation by course coordinator; Moderation by DPE committee of Department / Institute	1	2
Courses with optional design/practical experience component	Course Coordinator provides intimation to Departmental / Institute DPE Committee about offering optional design units prior to commencement of the course	Student to raise request on the NGU portal for prior permission, forwarded by course coordinator; Prior Approval by DPE coordinator; Evaluation by course coordinator; Moderation by DPE committee of Department / Institute	1	2
4-week project with Institute Faculty during winter/ summer (20 working days)	Notification of projects by DPE Committee of Student's Department / Institute	Student to raise request online for prior permission; Prior approval by DPE Committee of Student's Department; Evaluation by Faculty Supervisor of the project; Completion approval request by student forwarded through supervisor; Moderation by DPE committee of Department / Institute	1	1
8-week project with Institute Faculty including SURA, DISA, etc. (40 working days)	Department / Institute OR DPE Committee of Student's Department; Evaluation by Faculty Appropriate Mentor of the project / appropriate		2	2
Internship during summer with Industry / R&D / University (40 working days)	Arranged by OCS or self- arranged by the student	Student to raise request online for prior permission; Prior approval by DPE Committee of Student's Department; Monitoring by Internship supervisor; Completion approval request by student forwarded through supervisor; Evaluation and Moderation by DPE committee of Department / Institute	2	2

One semester internship (100 working days) or One semester break for own start-ups (singly or jointly)	Arranged by OCS or self- arranged by the student	Student to raise request online for prior permission; Prior approval of Institute DPE Committee on recommendation from DPE committee of Student's Department; Monitoring by Internship supervisor; Completion approval request by student forwarded through supervisor; Evaluation and Moderation by DPE committee of Department / Institute	5	5
Participation in design/project activity under the supervision of faculty during semester	Notification of projects by DPE Committee of Student's Department/Institute or the Student to approach the faculty	Student to raise request online for prior permission; Prior approval by DPE Committee of Student's Department; Evaluation by Faculty Mentor of the project; Completion approval request by student forwarded through supervisor; Moderation by DPE committee of Department / Institute	1	2
Participation in design/ practical/experience workshop/course/event organized by industry/ other institutions or visitors including visiting faculty	Proposal for activity to be recommended by faculty coordinator or Department DPE Committee and approved by Institute DPE Committee	Registration by the student in the activity; Evaluation by Faculty Coordinator and Visiting Faculty offering the course if any; Moderation by DPE committee of Department/Institute	1	1
Participation in design/innovation activities of clubs (eg. Robotics, IGEM, etc.)	Notification by the Faculty in-charge of the corresponding activity	Student to raise request online for prior permission; Prior approval by DPE Committee of Student's Department; Evaluation by faculty in-charge of activity/clubs; Completion approval request by student forwarded through supervisor; Moderation by Institute DPE committee	1	2

- A student cannot register for more than 3 non-graded DPE units per summer semester or per registered semester in which a student is on regular academic activity. To take part in activities that can result in more than 3 DPE units, a student has to take the semester off from regular courses.
- A single activity cannot be evaluated for more than one purpose. For example, the same project cannot be submitted for graded credits as well as for design units.

4.6.3 Rules Governing Internship

- i) Internships for DPE units are permitted only in one of the two following formats:
 - a. Summer internship of 40 days duration, in which a student can earn 2 DPE units.
 - b. Semester-long internship of 100 days duration, in which a student can earn 5 DPE units.

No other format of internship would be considered for the award of DPE units. DPE units would be awarded only if training for the stipulated number of working days, as mentioned above, is completed to the satisfaction of the concerned Departmental DPE Committee. DPE units would not be awarded against partial completion of the internship duration.

- ii) A student can choose from one of the following options in order to complete the requirements of Non-Graded component of Design / Practical Experience:
 - a. One semester internship, accounting for 5 DPE units.

- b. One summer internship, accounting for 2 DPE units and 1 to 3 DPE units from other activities at the Institute
- Two summer internships, accounting for a total of 4 DPE units, and if desired, 1 DPE unit from other activities at the Institute
- d. No internships: all DPE units can be earned through design / project activities at the Institute
- iii) A student can do at most two internships for DPE units, during his/her stay at the Institute. If any student does more than two internships, DPE units will be awarded for the first two registered internships only.
- iv) Summer internships are allowed in the summer after the 4th registered semester of the student or later. Semester Internships are permitted from the 7th registered semester or later.
- v) Internships are permitted in industry, research laboratories or academic institutions involved in research, development and/or technology transfer. Any student opting for semester long internship may also be allowed to work on a start-up. All internships must be approved by the departmental DPE committee in advance. In the case of non-industry internships, the work should be research / development / practice oriented, and not classroom course work.
- vi) In all cases, for award of DPE units, after completion of the internship, the work must be evaluated by the DPE committee of the student's Department. In case the work is found wanting in any respect, the student(s) will be advised to do more work and reappear before the committee. In any case, partial award of DPE units would not be allowed.
- vii) For self-arranged internships, any documentation regarding the bona fide status of students (while applying for training) will be provided by UG section.

4.6.3.1 Registration Procedure for Internships

Summer Internships:

- i) At the beginning of first semester of each academic year, the data of all students who have earned at least 30 credits would be automatically enrolled by the OCS for internship in the subsequent summer.
- ii) At the beginning of the internship in the following summer, the student must have completed 50 credits to be eligible.
- iii) OCS sends out information to the students about the companies offering summer internships. Interested students can apply for the same.
- iv) The students can also arrange for the internships on their own.
- v) If a student is selected for an internship through OCS, he/she is bound to accept the internship. If the student does not take up or complete the internship, he/she will be debarred from all further OCS activities including further internship opportunities and placement procedure. This is to discourage non-serious students from depriving other students of the opportunity, and damaging the reputation of IIT Delhi with the companies offering internships through OCS.
- vi) The OCS would handle correspondences and training certificates of all internships arranged by the OCS.
- vii) OCS will try and arrange internships for as many students as it can. However, it may not be possible for the OCS to arrange internships for all the students who participate in the process.
- viii) The OCS typically starts the process of selections for internships in August and ends in February- March. The exact dates would be notified by the OCS each year.
- ix) To claim DPE units for summer internships, a student is required to initiate activity XXT200 or XXT300 on the NGU portal prior to the commencement of the internship. A student should register in XXT200 if it is his/her first summer internship and XXT300 if it is second summer internship. The approval of initiation request will be as per the rules and regulations of the academic unit, which holds for both OCS arranged as well as self-arranged internships.
- x) At the end of summer internship, a student is required to submit training report and training certificate to the department DPE coordinator. Further, student will also need to raise the completion request for the registered activity XXT200/300. DPE units will be awarded after the due evaluation procedure of the respective academic unit.

Semester Internship:

- i) Semester internship, as mentioned in section 4.6.2.5, is permitted in the seventh registered semester or later, for students with at least 75 earned credits.
- ii) A student needs to submit a request on the NGU portal for prior approval of semester internship. The request for internship will be evaluated by the DPE committee of the student's parent Department and approved by the Institute DPE committee upon recommendation of the former.
- iii) Process of monitoring/mentoring the internship is described in section 4.6.2.5. Upon completion, the student should submit a request on the NGU portal for approval of the completion of the internship through the supervisor and Departmental DPE committee to the Institute DPE committee. The grade for semester internship is awarded by the Institute DPE committee.

The list of courses offered in connection with non-graded units listed in sections 4.1-8.6 along with the respective pre-requisites is summarized in Table 4.4.

Table 4.4: Summary of courses for non-graded unit

	0	Occurs Names and U. D. 114	B	Nie activité	
S. No.	Course Number	Course Name and/or Description	Pre-requisite(s)	No. of Units	
		Introduction to Engineering & Programme 01 units	:		
1	Introduction to Engineering and Programme in the first semester		_	1	
		Language and Writing Skills: 02 units			
2	NLN100	Language and Writing Skills–I in I semester		1	
3	NLN101	Language and Writing Skills–II in II semester	NLN100	1	
		NCC/NSO/NSS: Minimum 01 unit – Maximum 02 units			
4	NCN100	NCC		2	
5	NCN103	NCC		1	
6	NPN100	NSO —		2	
7	NPN103	NSO —		1	
8	NSN100	NSS	_ 2		
9	NSN102	NSS	_	1	
		Professional Ethics and Social Responsibility Minimum 01 unit – Maximum 02 units	ty:		
10	NEN110	Professional Ethics and Social Responsibility – I in first semester – 6-8 hours	_	0.25	
11	NEN111	Professional Ethics and Social Responsibility – II in second semester – 6-8 hours	NEN110	(for both together)	
12	NEN212	PESR Workshops: 5 days or 40 hours	NEN111 (Any one		
13	NEN213	PESR projects: 40 hours of work followed			
14	NEN300	Case Studies in Professional Ethics (6 hours of class engagement + preparation of case studies)	NEN111 0.5		

Communication Skills/Seminar: 01 units					
15	XXQ301, XXQ302, etc.	Topic specific Seminar courses introduced by parent Department	EC 50		
16	XYQ301, XYQ302, etc.	Additional Seminar courses introduced by any other Department/Centre/School	EC 50	(Any one)	
17	NQN301	Seminar component of regular courses OR Three extracurricular activities involving communication skills	EC 50		
		Design/Practical Experience: Minimum 03 units – Maximum 05 units			
18	XXD351	Minor Design Project – 1	EC 30	1	
19	XXD352	Minor Design Project – 2	EC 30	1	
20	XXD353	Minor Design Project – 3	EC 30	1	
21	XXD354	Minor Design Project – 4	EC 30	1	
22	XXD355	Minor Design Project – 5	EC 30	1	
23	XXD356	Minor Design Project – 6	EC 30	2	
24	XXD357	Minor Design Project – 7	EC 30	2	
25	XXD358	Minor Design Project – 8	EC 30	2	
26	NDN351	Minor Design Project – 1	EC 30	1	
27	NDN352	Minor Design Project – 2	EC 30	1	
28	NDN353	Minor Design Project – 3	EC 30	1	
29	NDN354	Minor Design Project – 4	EC 30	1	
30	NDN355	Minor Design Project – 5	EC 30	1	
31	NDN356	Minor Design Project – 6	EC 30	2	
32	NDN357	Minor Design Project – 7	EC 30	2	
33	NDN358	Minor Design Project – 8	EC 30	2	
34	XXT200	Summer Internship – 1	EC 30	2	
35	XXT300	Summer Internship – 2	XXT200	2	
36	XXT400	Semester Internship	EC 75	5	

In all above course descriptions, XX and XY stand for the two-letter prefix corresponding to course numbers of academic units (Table 1 of Chapter 1): example, XXD351 corresponding to Department of Textile Technology would be TXD351.

4.7 Overlapping Activities

Many of the activities listed under a given component in sections 4.1-9.6 could also qualify as valid activities under other non-graded components: for example, a technical project done as part of NEN213 may qualify to be submitted for DPE units under XXD35y, etc. Some of the technical projects may also qualify as valid activities under Minor/Mini/Major projects towards earning graded credits. In this regard, the following would be strictly followed: In case a project is evaluated for graded credits or for any other non-graded activity, it would not be allowed to be re-submitted for any other non-graded unit. While submitting the completion request of the project online, a student should submit an undertaking to this effect, approved online by the faculty supervisor of the project.

- In the summer when student has registered for Summer Internship (either through OCS or self-arranged);
 they cannot be registered for any course or other institute activity.
- b) Additional work which is not evaluated for such projects, either done prior to such projects or done after the completion of such projects, could be considered. In such a case, prior written permission must be taken from the concerned committee (PESR, DPE, etc.), explicitly describing components of work being submitted for the other graded/non-graded evaluations and for the current submission separately. In this regard, note the following examples:

The workshops organised by NSS and under NEN212 would be generally distinct. Under NEN212, workshops would have minimum duration of 5 days and would be designated as "PESR WORKSHOP". Workshops organized by NSS would not be counted for NEN212 and vice-versa.

INDIAN INSTITUTE OF TECHNOLOGY DELHI THE HONOUR CODE

No	do hereby und	lertake that as a student at IIT Delhi :		
1)	_	minations; that I will not give or receive preparation of reports, or in any other ructor as the basis of grading; and		
2)	I will do my share and take an activas myself uphold the spirit and let	ve part in seeing to it that others as well ter of the Honour Code.		
	I realise that some examples of min violation of the Honour Code in	nisconduct which are regarded as being clude:		
	Copying from another's examination one's own paper;	tion paper or allowing another to copy		
	Unpermitted collaboration;			
	Plagiarism;			
	Revising and resubmitting a marked quiz or examination paper for regrading without the instructor's knowledge and consent;			
	Giving or receiving unpermitted aid on take home examinations;			
	Representing as one's own wo	ork, the work of another, including net;		
		lemic assignment under circumstances ould have known that such aid was not		
	Committing a cyber-offence, such sharing passwords, electronic cop	n as, breaking passwords and accounts, bying, planting viruses, etc.		
	cept that any act of mine that can ation will invite disciplinary action.	be considered to be an Honour Code		
Date	2	Student's Signature		
		Name		
		Entry No		

