# SANT GADGE BABA AMRAVATI UNIVERSITY GAZETTE

Official Publication of Sant Gadge Baba Amravati University

**PART- ONE**

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Thursday, the 12th February, 2026

**DIRECTION**

No.06/2026 Date : 12/ 02/2026

**Subject** : **Examination leading to the Multi-disciplinary degree of B.E. /B.Text.E. / B.Tech. (Chem.Engg.)/ B.Tech.(Chem.Tech.) (Food, Pulp & Paper, Oil & Paint & Petrochemical Technology) Major in … Minor in … (Four Year Degree Course Semester Pattern) and B.E. /B.Text.E. /B.Tech. (Chem. Engg.) / B.Tech.(Chem.Tech.) (Food, Pulp & Paper, Oil & Paint & Petrochemical Technology) (Honors) or Honors with Research as per National Education Policy- 2020 in the Faculty of Science & Technology, [Engineering & Technology Group] Direction, 2026**.

Whereas, Direction No. 42/2021 in respect of the Examinations leading to the degree of B.E./B.Text.E./B.Tech. (Chemical Engineering)/ B.Tech. (Chemical Technology) (Polymer)(Plastic) Tech. (Common to all branches) (Four Year degree Course Semester Pattern as per Choice Based Credit System) courses in the Faculty of Science & Technology is in existence,

AND

Whereas, the Government of India has set up multi stakeholder task force for New Education Policy – 2020 Task Force (NEPTF ) on 27/02/2015,

AND

Whereas, the Government of Maharashtra has issued resolution No. Abhyas-2015/pra.kra.611/vishi.shi.-3, dated 31st October, 2015 for constitution of Task Force for designing the policy for implementation of NEP-2020,

AND

Whereas, the Government of Maharashtra has constituted a Task Force as per G.R. No. Sankirna-2015/pra.kra.176/vishi-3, dated 16th October, 2020 by the Cabinet for preparation of road map for the implementation of NEP-2020,

AND

Whereas, the Report of the Task Force has been prepared on 30/06/2021 and approved by the Cabinet of Government of Maharashtra on 22/01/2022,

AND

Whereas, the Government of Maharashtra has issued the Resolution No.NEP-2022/pra.kra.105/vishi-3, dated 06.12.2022 and NEP-2022/867/23/tanshi-2, dated 04.07.2023 for credit framework,

AND

Whereas, the Government of Maharashtra has issued the Resolution No. NEP-2022/pra.kra.0/vishi-3, shikana, dated 26.12.2022, 20.04.2023, 6.05.2023, 04.07.2023, 25.01.2024, 13.03.2024 & dated 02/07/2024 for implementation of NEP for Under Graduate and Post Graduate Programmes,

AND

Whereas, the joint meetings of all the Pro-Vice Chancellors and the Deans were held with steering Committee at Pune on 23rd and 24th January, 2023,

AND

Whereas, as per the letter from the Government, a workshop of all the Principals and Nodal Officers were held with the Steering Committee on 21/02/2023 in the University,

AND

Whereas, as per the instructions of Government of Maharashtra, Pro-Vice Chancellor has constituted a 13 member Committee under his Chairmanship to formulate the Teaching, Learning, Examination and Evaluation Scheme and Draft Provisions for Direction/Ordinance as per the National Education Policy- 2020 on 28/02/2023,

AND

Whereas, the Committee has proposed the Draft Scheme of Teaching, Learning, Examination and Evaluation and Draft Provisions of Ordinance/Direction,

AND

Whereas, as per the instructions given by the Director, Higher Education, Pune Region, Pune a joint meeting of the Principals of 20 colleges & the Deans of the Faculties, and passed the resolution on 07/04/2023,

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AND

Whereas, a Joint meeting of all the Principals, the Deans of the Faculties with the Joint Director, Higher Education, Amravati Region, Amravati on the resolutions which have been passed during 07/04/2023 regarding the workload and the same has been placed on 17/04/2023,

AND

Whereas, joint meeting of the Deans of the Faculties along with the members of Steering Committee were held on 15/06/2023 at Mumbai,

AND

Whereas, as per letter kr.-UNI/(136-22)/vishi-1/bhag-3 1799 dated 18th March, 2024, a Committee is constituted for the Draft Scheme of Teaching, Learning, Examination & Evaluation and Draft provisions for Ordinance/ Direction,

AND

Whereas, Dept. of Higher & Technical Education, Govt. of Maharashtra, Mantralaya, Mumbai, has issued a G.R. vide No.NEP-2022/(67/23)T.E.-2 dtd. 4/07/2023 regarding implementation of National Education Policy-2020 in first phase to the AICTE regulated Under-graduate Engineering & Technology Programmes conducted in Autonomous Colleges and the State University Campuses in various Non-agricultural Universities in Maharashtra with effect from the Academic Year 2023-2024 & onwards and in Second Phase for the rest of all the affiliated colleges under the University from the Academic Year 2024-2025 & onwards,

AND

Whereas, Dept. of Higher & Technical Education, Govt. of Maharashtra, Mantralaya, Mumbai, has clarified vide its letter dtd. 4/06/2024 regarding explanation on some of the verticals of the G.R. dtd. 04.07.2023 for effective implementation of National Education Policy-2020 to the AICTE regulated Under-graduate Engineering & Technology Programmes conducted in Autonomous Colleges and the State University Campuses in various Non-agricultural Universities in Maharashtra with effect from the Academic Year 2023-2024 & onwards and in Second Phase for the rest of all the affiliated colleges under the University from the Academic Year 2024-2025 & onwards,

AND

Whereas, the Hon'ble Vice-Chancellor has constituted the Committee of all the Chairpersons of the Board of Studies & Ad-hoc Committees and 1 Faculty member of each Board of Studies of Engineering &Technology under the Chairmanship of the then Dean, Faculty of Science & Technology for preparation of the draft structure of the Schemes of Teaching, Learning, Examination & Evaluation and other related draft provisions for Under-graduate programmes of Engineering & Technology as per NEP-2020 guidelines,

AND

Whereas, the Committee in its meeting held on 05.12.2024 suggested some corrections in the draft Structure of the Schemes of Teaching, Learning, Examination & evaluation and other related draft provisions for Under-graduate programmes of Engineering & Technology as per NEP-2020 guidelines of the G.R. of Govt. of Maharashtra dated 04.07.2023 and recommended the same to the Faculty of Science & Technology to be implemented from the academic session 2025-2026 and onwards,

AND

Whereas, the various Board of Studies & Ad-hoc Committees of Engineering & Technology group in their meetings held in January 2025 has prepared and submitted and further resolved to recommend the draft Schemes of Teaching, Learning, Examination & evaluation of Semester III to VIII and other related draft provisions for Under-graduate programmes of Engineering & Technology as per NEP-2020 guidelines to the Faculty of Science & Technology to be implemented from the academic session 2025-2026 and onwards,

AND

Whereas, the Faculty of Science & Technology of its meeting held on 22.05.2025 vide Item No. 19 (III) A) to D) accepted the recommendations of the various Board of Studies & Ad-hoc Committees as per above para and further resolved to recommend the same to the Academic Council to be implemented from the academic session 2025-2026 and onwards,

AND

Whereas, the Academic Council of its meeting held on 08.07.2025 vide Item No. 25 (II) A) to K) accepted and approved the recommendations of the Faculty of Science & Technology as per above para to be implemented from the academic session 2025-2026 and onwards,

AND

Whereas, the Committee of all the Chairpersons of the Board of Studies of Engineering & Technology group as constituted by the Hon'ble Vice-Chancellor has submitted the corrected Guidelines for award of- Double Minor & Honors degree and Honors with Research Degree under Four year Bachelor's degree in Engineering & Technology with Multi-disciplinary Minor to the office in which has been approved by the Academic Council,

AND

Whereas, the Schemes of Teaching, Learning, Examination and Evaluation of Semester III to VIII of the various branches of Engineering & Technology stream [Civil, Mechanical, Electronics & Telecommunication, Computer Science & Engineering, Computer Engineering, Artificial Intelligence & Data Science, Computer Science & Engineering (Data Science), Electrical Engineering, Electrical Engineering (Electronics & Power), Chemical Engineering, Chemical

Technology (Food, Pulp & Paper, Oil & Paint and Petrochemical Tech.) as per NEP-2020 guidelines and other provisions as given by the Committee of all the Chairpersons of Engineering & Technology stream as mentioned above are required to be regulated by an Ordinance /Regulation,



AND

Whereas, the matter of making of an Ordinance is time consuming process, hence, it is necessary to issue a Direction under Section 12 (8) of the Maharashtra Public Universities Act, 2016,

Now, therefore, I, Dr. Milind Barhate, Vice-Chancellor, Sant Gadge Baba Amravati University, in exercise of the powers conferred upon me under Sub-Section (8) of the Maharashtra Public Universities Act, 2016, do hereby direct as under:

**1)** This Direction may be called "Examination leading to the Multi-disciplinary degree of B.E./ B.Text.E./B.Tech.(Chemical Engineering)/B.Tech.(Chemical Technology) (Food, Pulp & Paper, Oil & Paint & Petrochemical Technology) Major in … Minor in … (Four Year Degree Course Semester Pattern) and B.E. /B.Text.E. /B.Tech. (Chem.Engg.) /B.Tech.(Chem.Tech.) (Food, Pulp & Paper, Oil & Paint & Petrochemical Technology) (Honors) or Honors with Research as per National Education Policy- 2020 in the Faculty of Science & Technology, [Engineering & Technology Group] Direction, 2026.

**2)** This Direction shall belong to the Faculty of Science & Technology.

**3)** This Direction shall come into force with effect from the date of its issuance.

**4)** This Direction shall come into force with effect from the Academic Session as follows:-

i) Semester I & II from the academic session 2024-2025
ii) Semester III & IV from the academic session 2025-2026
iii) Semester V & VI from the academic session 2026-2027
iv) Semester VII & VIII from the academic session 2027-2028.

**5)** The Schemes of Teaching, Learning, Examination and Evaluation of Semester III & VIII for all the Under-graduate programmes of Engineering & Technology as per NEP-2020 guidelines shall be as per **Appendix – A** attached with the direction.

**6) The provisions of Directions, eligibility criteria and other details are as follows:**

(i) Subject to the conditions prescribed by the Government from time to time, for admission to First Year B.E./B.Text.E. / B.Tech. (Chemical Engineering) / B.Tech. (Chemical Technology) (Food, Pulp & Paper, Oil & Paint & Petrochemical Technology) courses, the candidate shall be considered eligible :

Passing 12th Standard Examination of the Maharashtra State Board of Secondary and Higher Secondary Education, with subjects:

1. English (Higher or Lower)
2. Modern Indian Language (Higher or Lower)
3. Mathematics and Statistics.
4. Chemistry.
5. Physics.
6. Any other optional subject from out of the list prescribed by the said Secondary and Higher Secondary Education Board.

OR

i) English (Higher or lower)
ii) Mathematics and Statistics.
iii) Chemistry
iv) Physics
v) Vocational subject (Defined by the said Board as a Technical Subject)

OR

An Examination recognized by the Sant Gadge Baba Amravati University as an equivalent to the above.

(ii) Subject to the conditions prescribed by the Govt. from time to time for direct admission to the second B.E. / B.Text.E. / B.Tech. (Chem. Engg.) / B.Tech. (Chem. Tech.) (Food, Pulp & Paper, Oil & Paint & Petrochemical Technology), the candidates shall be considered eligible :-

Passing Diploma in relevant branch in First Division, awarded by the Board of Technical Examination of Maharashtra State, Mumbai.

OR

Any Diploma equivalent to the corresponding Diploma of the Board of Technical Examination of Maharashtra State, Mumbai.

**7)** As per the earlier provisions in the CGS & CBCS pattern Directions regarding intake of the admitted students for Semester I & II of all the Engineering & Technology prorammes [(except B.Tech.(Chem.Tech) (Food, Pulp & Paper,

Oil & Paint & Petrochemical Technology), both the Semesters I & II of First Year shall be run parallel or in uniform way for smooth conduct of the operation process which is as under:



**Description about New First Year Scheme for all branches of Engineering & Technology with Group A & Group B subjects:**

i) The sanctioned intake and / or the number of the candidates admitted to first year Engineering shall be divided into two Groups as A & B in the multiples of 60 preferable at the institute level.
ii) Group – A candidates shall registrar for Group – A subjects in first semester and Group – B candidates shall registrar for Group – B subjects in first semester.
iii) The candidates shall be examined for their subjects from the respective groups in First Semester.
iv) In the Second Semester, candidates from Group – B shall registrar for the subjects of Group – A. Similarly, candidates from Group – A shall registrar for the subjects of Group – B .
v) The candidates shall be examined for their subjects from the other groups in second Semester.
vi) Thus, at the end of the first year, all the subjects shall be studied by the candidates from both the groups.
vii) The Mark list shall show only the group obtained in respective Semester, list first Semester Group – B, first Semester Group – A.
viii) The exercise on the part of the college shall be to ensure that the candidates fill up the examination forms correctly according to the subjects group he / she has registered in both the Semesters.

**(I) NEP IMPLEMENTATION IN FIRST PHASE:**

**I.1 Applicability**: This scheme shall be applicable to the undergraduate Programmes B.E. (Bachelor of Engineering), B.Tech. (Bachelor of Technology), B.Text.E. (Bachelor of Textile Engineering) and other UG Engineering Degree Programmes in the faculty of Science & Technology. The Department Specific Core (DSC) concept shall be implemented at non-autonomous affiliated colleges for the above-mentioned programme.

**I.2 Objective**: The structure of the four – years Bachelor's Degree Programme alters the opportunity to students t experience the full range of holistic and multi-disciplinary education in addition to a focus on the chosen Major and Minor as per their choices and the feasibility of exploring learning abilities.

**Explanation:**

**(a) Major (Core) Subject 80 – 88 Credits**: It is the discipline or subject of main focus and the degree will be awarded in that discipline/Subject. For example: B.E./B.Tech. in various disciplines, such as B.E. (Civil Engineering), B.E. (Mechanical Engineering), B.Tech. (Chemical Technology), B.Text.E. (Bachelor in Textile Engineering), etc.

Students shall have to secure a minimum 50% of total Credits through Core Courses (mandatory courses, electives, vocational courses, Major Specific IKS, Internship/ Field Projects/ Apprenticeship/ Community Engagement Projects, Seminars, and Group Discussion).

In general, for the four years' bachelor's degree programme, the distribution of credits will be as follows:

**Major (Core) Subject comprising Mandatory and Elective Courses:**

i. Minimum 50% of total credits corresponding to Four - year UG Degree- Mandatory Courses offered in all Four years;
ii. Elective courses of Major will be offered in the third and/or final year.
iii. Vocational Skill Courses, Internship/ Apprenticeship, Community Engagement Project (CEP)/ Field Projects (FP), Research Projects connected to Major.

**(b) Minor Subject 14 Credits**: Minor subjects will be subjects focusing on multidisciplinary education as expected in the NEP-2020. The student choosing department specific core (DSC) may choose Minor from same faculty or faculty unrelated to the Major, but something that complements the Major.

**Compulsory Multi-disciplinary Minor Subject: 14 Credits**

i. The Minor subjects may be from the different disciplines of the Engineering faculty, or they can be from different faculty altogether.

ii. The credits of compulsory Minor subjects shall be completed from the second year to the final year of UG Programme.

**(c) Generic/Open Elective Course (GE/OE) 08 Credits**: A student is required to select an 'Generic/Open Elective Course' from the 'Generic/Open Elective Course Basket' of any Programme offered by the university in any faculty before filling the examination form for the semester concerned. Such an 'Generic/Open Elective Course' cannot be selected from the subjects chosen by a student as 'Major' and 'Minor' subjects.

**Generic/ Open Elective Courses (OE): 08 credits**

i. It is to be offered in Second and/or Third year
ii. Faculty-wise baskets of OE shall be prepared by the University/Autonomous Engineering Colleges.

iii. OE is to be chosen compulsorily from faculty other than that of the Major Discipline.



**(d) Vocational and Skill Enhancement Courses (VSEC) 08 – 12 Credits:**

i. Vocational Skill Course (VSC) - 08 Credits: Wherever applicable vocational courses will include skills based on advanced laboratory practical of Major. A student is required to successfully complete the 'VOCATIONAL SKILL COURSE' as mentioned in this scheme of examination. This course must be a course corresponding to the 'MAJOR' subject selected by a student.

- Vocational Skill Courses (VSC): 04 credits, including Hands on Training corresponding to the Major and/or Minor Subject:

a. To be offered in first three years;

b. Wherever applicable vocational courses will include skills based on advanced laboratory practicals of Major.

ii. **Skill Enhancement Course (SEC) - 04 Credits**: A student is required to select a 'SKILL ENHANCEMENT COURSE' from the basket provided by the university for this purpose.

- **Skill Enhancement Courses (SEC): 04 credits:**

i. To be offered in first three years;

ii. To be selected from the basket of Skill Courses approved by University/Autonomous Engineering Colleges.

**(e) Ability Enhancement Courses (AEC), Indian Knowledge System (IKS) and Value Education Courses (VEC) - 10 Credits:**

i. **Ability Enhancement Course (AEC) - 04 Credits**: A student is required to undergo and successfully complete the 'ABILITY ENHANCEMENT COURSE' as English for 02 Credits and Modern Indian Language for 02 Credits.

i. To be offered in First and Second year

ii. English: 02 Credits

iii. Modern Indian Language: 02 credits

iv. To be offered from the Basket approved by University / Autonomous College;

The focus for both languages should be on linguistic and communication skills.

ii. **Generic IKS Course - 02 Credits**: These are expected to contain basic knowledge of the Indian Knowledge System (IKS). It should contain introductory information to the IKS. The student should be able to acquire a basic knowledge after completion of the course.

(**Subject Specific IKS Course**: This is 2 Credit courses should contain advanced information pertaining to the subject as these will be considered as a part of the Major Credit. The student should have completed the Generic level as a prerequisite before enrolling in the discipline related course)

i. To be offered in First Year

ii. Courses on IKS to be selected from the basket of IKS courses approved by University/ Autonomous Colleges or as per AICTE / UGC Guidelines on IKS.

iii. **Value Education Courses (VEC) - 04 Credits**:

i To be offered in Second year

ii Value Education Courses (VEC) such as Understanding India, Environmental Science/Education, and Digital and Technological Solutions.

**(f) Field Projects/ Internship/ Apprenticeship/ Community Engagement and Service corresponding to the Major (Core) Subject, Co-curricular Courses (CC) and Research Project:**

These verticals of Major are to be completed by the student under the supervision of mentor faculty as per Teaching Learning Scheme.

- **Internship/Apprenticeship corresponding to the Major (Core) Subject**: 12 Credits. Internship of One Semester duration shall be offered either in the VII or VIII semesters. Courses offered during the Internship Semester shall be offered **in online mode**.
- **Field Projects/Community Engagement Projects corresponding to the Major (Core) Subject**: minimum 02 credits.
- To be offered in the Second year of UG Degree Programmes.
- Co-curricular Courses (CC) such as Health and Wellness, Yoga education sports, and fitness, Cultural Activities, NSS/NCC and Fine/ Applied/ Visual/Performing Arts: 04 credits
- To be offered in First year.

**(g) Additional Credits for Bachelor's degree- with Double Minor OR Honors: 18-20 Credits:**

- These are additional credits to be offered from the second year to the final year and will be offered as an option to students.

(h) Additional Credits for Bachelor's degree- Honors with Research: Minimum 18 Credits

- These are additional credits to be offered in the final year and will be offered as an option to students.



The UGC Regulations, 2021 permit up to 40% of the total courses being offered in a particular programme in a semester through the **Online Learning Courses** offered through the **SWAYAM** platform and/or other State Level Common Platforms which can be developed in due course with the participation of different Universities/ HTEIs.

(II) **Credit Framework under Four-Years UG Engineering Programme with Multiple Entry and Multiple Exit options:**

The Four-year Bachelor's Multidisciplinary Engineering Degree Programme allows the students to experience the full range of holistic and multidisciplinary education in addition to a focus on the chosen major and minors as per their choices and the feasibility of exploring learning in different institutions.

The minimum and maximum credit structure for different levels under the Four-year Bachelor's Multidisciplinary Engineering UG Programme with multiple entry and multiple exit options shall be as per **Table No. 1**:

**CREDIT FRAMEWORK**

**Table 1: Credit Framework**

| Levels | Qualification Title | Credit Requirements | | Semester | Year |
|---|---|---|---|---|---|
| | | Minimum | Maximum | | |
| **4.5** | One Year UG Certificate in Engg./Tech. | 40 | 44 | 2 | 1 |
| **5.0** | Two Years UG Diploma in Engg./Tech. | 80 | 88 | 4 | 2 |
| **5.5** | Three Years Bachelor's Degree in Vocation (B. Voc.) or B.Sc. (Engg./Tech. Tech.) | 120 | 132 | 6 | 3 |
| | 4-Years Bachelor's degree | | | | |
| **6.0** | (B.E./ B.Tech. or Equivalent) in Engg. / Tech. with Multidisciplinary Minor | 160 | 176 | 8 | 4 |
| **6.0** | 4-Years Bachelor's degree (B.E./ B.Tech. or Equivalent) in Engg. / Tech.- Honors and Multidisciplinary Minor | 180 | 194 | 8 | 4 |
| **6.0** | 4-Years Bachelor's degree (B.E./ B.Tech. or Equivalent) in Engg. / Tech.- Honors with Research and Multidisciplinary Minor | 180 | 194 | 8 | 4 |
| **6.0** | 4-Years Bachelor's degree (B.E./ B. Tech. or Equivalent) in Engg. / Tech.- Major Engg. Discipline with Double Minors (Multidisciplinary and Specialization Minors) | 180 | 194 | 8 | 4 |

(a) Credits offered per Semester will be a Minimum 20 and a Maximum 22. While minimum credits are mandatory as per National Credit Framework, the Universities and Autonomous Engineering Colleges can evolve the mechanism for providing Semester/ Level wise credit attainment flexibility within the broad framework.

(b) With effect from Academic Year 2024-25, the first year of 4-Years Multidisciplinary Bachelor's Degree in Engineering / Technology Program (B.E./ B.Tech. or Equivalent) will be introduced. Thus, the Fourth Year of Bachelor's Engg./ Tech. Degree (Level 6.0) with various options- Bachelor's Engineering / Technology Degree in chosen Major Engineering / Technology Discipline with Multidisciplinary Minor (160-176 credits), OR Bachelor's Engg./ Tech. Honors Degree in chosen Major Engineering / Technology Discipline with Multidisciplinary Minor (180-194 credits) OR Bachelor's Engineering / Technology Honors with Research Degree in chosen Major Engineering / Technology Discipline with Multidisciplinary Minor (180-194 credits) OR Bachelor's Engineering / Technology Degree in chosen Major Engineering / Technology Discipline with Double Minor (Multidisciplinary and Specialization Minor, 180-194 credits) will begin with effect from Academic Year 2027-2028.

(c) Under Bachelor's Engineering / Technology Honors with Research Degree in chosen Major Engineering / Technology Discipline with Multidisciplinary Minor (180-194 credits), the students will work on a research project or

dissertation for 18 credits in the fourth year in the respective Major Engineering / Technology Discipline. The decision regarding the distribution of18 credits for Research Project in Semesters VII and VIII of the Fourth Year will be taken by Academic Authorities of University/ Autonomous Engineering Colleges. These 18 Credits will be over and above the min.160-max.176 Credits prescribed for Four Year Multidisciplinary Bachelor's Degree in Engineering / Technology Program.



(d) The Bachelor's Engineering / Technology Honors Degree in chosen Major Engineering / Technology Discipline with Multidisciplinary Minor (180-194 credits) enables students to take up five-six additional courses in the same Engg. / Tech. discipline of 18 to 20 credits distributed over semesters III to VIII. The decision regarding the mechanism of distribution of these 18-20 credits over semesters III to VIII, which are over and above the min.160-max.176 Credits prescribed for Four Year Multidisciplinary Bachelor's Degree in Engineering / Technology will be taken by Academic Authorities of University / Autonomous Engineering Colleges.

(e) Under Bachelor's Engineering / Technology Degree in chosen Major Engineering / Technology Discipline with Double Minor (Multidisciplinary and Specialization Minor, 180-194 credits), students would take up five-six additional courses of 18 to 20 credits in another Engineering / Technology discipline/ Emerging Areas Specialization distributed over semesters III to VIII. The decision regarding the mechanism of distribution of these 18-20 credits over semesters III to VIII, which are over and above the min.160-max.176 Credits prescribed for Four Year Multidisciplinary Bachelor's Degree in Engineering / Technology will be taken by Academic Authorities of University/ Autonomous Engineering Colleges.

(f) The NEP 2020 Four Year Multidisciplinary Engineering Curriculum Framework offers:

i. The flexibility to move from one discipline of study to another.
ii. The opportunity for learners to choose the courses of their interest in all disciplines.
iii. The multiple entry and exit options with the award of UG certificate/ UG diploma/ or three- year degree depending upon the number of credits secured.
iv. The flexibility for learners to move from one institution to another to enable them to have multi and/or interdisciplinary learning.
v. Mandatory One Semester Internship/ On Job Training (OJT).
vi. Provision of Vocational and Skill Enhancement Courses (VSEC), Indian Knowledge System (IKS), Community Engagement Project (CEP)/Field Project (FP) in Major Discipline Degree.
vii. Horizontal and Vertical mobility with multiple entry and exit options at each Level.
viii. Provision of NSQF compliant Skill-based Courses and internships for Exits at different Levels.
ix. Credits for Co-curricular and Extra-Curricular Activities as Curricular activities besides provision of credit for the Ability Enhancement Courses (AEC) and Value Education Courses (VEC).
xi. Interdisciplinary or Multidisciplinary education through Single and Double Minors and Open Electives (OE).
xii. The flexibility to switch to alternative modes of learning (offline, ODL, and Online learning, and hybrid modes of learning).

**(III) NEP 2020 CURRICULUM FRAMEWORK OFFERS:**

i. The flexibility to move from one discipline of study to another.
ii. The opportunity for learners to choose the courses of their interest in all.
iii. The multiple entry and exit options with the award of UG certificate/ UG diploma/ or Three-years and Four years degree depending upon the number of Credits secured.
iv. The flexibility for learners to move from one institution to another to enable them to have multi and/or interdisciplinary learning.
v. The flexibility to switch to alternative modes of learning (offline, ODL, and Online learning, and hybrid modes of learning).

**(IV) CREDIT DISTRIBUTION STRUCTURE:**

**Illustrative Semester wise Credit distribution structure for Four Year UG Engineering Program - One Major, One Minor:**

**TABLE 2: Credit Distribution Structure**

| Semester | | I | II | III | IV | V | VI | VII | VIII | Total Credits |
|---|---|---|---|---|---|---|---|---|---|---|
| Basic Science Course | BSC/ESC | 06-08 | 08-10 | | -- | -- | -- | -- | -- | 14-18 |
| Engineering Science Course | | 10-08 | 06-04 | | -- | -- | -- | -- | -- | 16-12 |
| Programme Core Course (PCC) | Program Courses | -- | 02 | 08-10 | 08-10 | 10-12 | 08-10 | 04-06 | 04-06 | 44-56 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Program Elective Course (PEC) | | -- | -- | -- | -- | 04 | 08 | 02 | 06 | 20 |
| Multidisciplinary Minor (MDM) | Multidisciplinary Courses | | - | 02 | 02 | 04 | 02 | 02 | 02 | 14 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Open Elective (OE) Other than a particular program | | -- | -- | 04 | 02 | 02 | -- | -- | -- | 08 |
| Vocational and Skill Enhancement Course (VSEC) | Skill Courses | 02 | 02 | -- | 02 | -- | 02 | -- | -- | 08 |
| Ability Enhancement Course (AEC -01, AEC-02) | | 02 | -- | -- | 02 | -- | -- | -- | -- | 04 |
| Entrepreneurship/Economics/ Management Courses | Humanities Social Science and Management (HSSM) | -- | | 02 | 02 | -- | -- | -- | -- | 04 |
| Indian Knowledge System (IKS) | | | 02 | | -- | -- | -- | -- | -- | 02 |
| Value Education Course (VEC) | | -- | -- | 02 | 02 | -- | -- | -- | -- | 04 |
| Research Methodology | Experiential Learning Courses | -- | -- | -- | -- | -- | -- | | 04 | 04 |
| Comm. Engg. Project (CEP)/Field Project (FP) | | -- | -- | 02 | -- | -- | -- | - | - | 02 |
| Project | | -- | -- | -- | -- | -- | -- | | 04 | 04 |
| Internship/ OJT | | -- | --- | | | -- | -- | 12 | - | 12 |
| Co-curricular Courses (CC) | Liberal Learning Courses | 02 | 02 | | -- | -- | -- | -- | - | 04 |
| **Total Credits (Major)** | | **20-22** | **20-22** | **20-22** | **20-22** | **20-22** | **20-** | **20-** | **20-** | **160-176** |

**Abbreviations:** Generic/ Open Electives: OE; Vocational Skill and Skill Enhancement Courses: VSEC; Vocational Skill Courses: VSC; Skill Enhancement Courses: SEC; Ability Enhancement Courses: AEC; Indian Knowledge System: IKS; Value Education Courses: VEC; OJT: On Job Training: Internship/ Apprenticeship; Field projects: FP; Community engagement project: CEP; Co-curricular Courses: CC; RM: Research Methodology; Research Project: RP, Liberal Learning Course: Lib. Learn, Courses on Humanities, Social Science, and Management: HSSM**.**

**Note:** The Credit Distribution Table given above is illustrative only. The Universities/ Autonomous Colleges may suitably modify within the broader framework of credit distribution across seven verticals and as per the AICTE rules and regulations**.**

**(V) CHOICE OF MAJOR AND MINOR SUBJECTS/ DISCIPLINE:**

5.1 Major (Core) Subject: Major (Core) Subject is the Engineering/ Technology discipline or subject of main focus and the degree will be awarded in that discipline/ Subject. Students should secure a minimum 50% of total credits through Core Courses (mandatory courses, electives, vocational courses, Internship/Field Projects/ Apprenticeship/Community Engagement Projects, Seminars, and Group Discussions). In addition, for the award of Bachelor's Degree- with Double Minor OR Honors students shall have to earn additional 18-20 credits by opting for courses of Emerging Specializations or the Same Discipline, respectively. For the award of Bachelor's Degree- Honors with Research, students shall have to earn additional 18-20 credits through Research Project or Dissertation.

**(VI) COURSES ON INDIAN KNOWLEDGE SYSTEM (IKS):**

The concerned academic authorities, while defining the curriculum for modules/courses on IKS, may take the support of the Indian Knowledge System (IKS) Cell under the Ministry of Education (MoE) at AICTE, New Delhi which is established to promote interdisciplinary research on all aspects of IKS, preserve and disseminate IKS for further research and societal applications. The IKS Cell has established multiple IKS Centers at different Institutes in various parts of the country to act as a catalyst for initiating research, education and outreach activities. In addition, the list of courses may be developed and offered in online or offline mode by the parent university or the specialized HEIs.

The courses to be developed under the Indian Knowledge Systems (IKS) are as follows:

**VI.1 Generic IKS Course:** These are expected to contain basic knowledge of the IKS subject. It should contain introductory information to the IKS. The student should be able to acquire basic knowledge after completion of the course.

**VI.2 Subject-Specific IKS Courses:** These courses should contain advanced information pertaining to the subject as these will be considered as a part of the major credit. The student should have completed the Generic level as a prerequisite before enrolling in the discipline-related course**.**

The Autonomous Institutes/ Universities may evolve their own IKS subject-related courses by following UGC guidelines in this regard.

**(VII) CREDIT SPECIFICATIONS (Calculation of Workload) :**

i. **Theory Courses**: 13-15 hours of teaching per credit is required in a semester.
ii. **Laboratory Course**: 26-30 hours in laboratory activities per credit is required in a semester.
iii. **Studio activities**: Studio activities involve the engagement of students in creative or artistic activities. Every student is engaged in performing a creative activity to obtain a specific outcome. Studio-based activities involve visual- or aesthetic-focused experiential work. A minimum of 26-30 hours in studio activities per credit in a semester is required.
iv. **Workshop-based activities**: Courses involving workshop-based activities require the engagement of students in hands-on activities related to work/vocation or professional practice. Every student is engaged in performing a skill-based activity. Related to specific learning outcome (s). 26-30 hours of workshop-based activities per credit in a semester is required.
v. **Seminar/ Group Discussion**: 13-15 hours of participation in seminar/ Group Discussion activity per credit in a semester is required.
vi. **Internship**: Credits for internship shall be one credit per two weeks of internship (or 36-40 hours of engagement), The internship shall be monitored jointly by the faculty and Industry/ Organization Mentor. Internship of One Semester duration shall be offered either in the VII or VIII semesters. Courses offered during the Internship Semester shall be offered in online mode.
vii. **Field-based Learning/ Practices**: These are the courses requiring students to participate in field- based learning/projects generally under the supervision of faculty. A minimum of 26-30 hours of learning activities per credit in a semester is required.
viii. **Community Engagement Projects**: These are the courses requiring students to participate in field- based learning/ projects generally under the supervision of faculty. The curricular component of 'community engagement and service' will involve activities that would expose students to the socio-economic issues in society so that the theoretical learnings can be supplemented by actual life experiences to generate solutions to real-life problems. 26-30 hours of contact time per credit in a semester along with 13-15 hours of activities such as preparation for community engagement and service, preparation of reports, etc., and independent reading and study with 2 credit courses.

**(VIII) ABC, ADMISSION SYSTEM, MULTIPLE ENTRY AND EXIT PATH AND LATERAL ENTRY:**

**VIII.1 Enrolment of Students and Registration of Colleges on ABC:**
All State Universities/ Autonomous Institutes must promote registering on ABC. Since Credits awarded to a student for one programme from an institution may be transferred/redeemed by another institution upon the student's consent through ABC, it is essential that all students should get enrolled on ABC, create ABC ID, and share these ABC IDs with Academic Institutions where they are enrolled. Credits Earned by the student will reflect in the student's ABC account.

**Multi-institutional learning permission**: The student shall be allowed to earn some credits from institutions/colleges other than the Main/ Parent College i.e. a college where students earn all their major credits (more than 50%) including credits for the core subject. Students enrolled in the degree programmes may avail of other elective credits from two different colleges affiliated with the same University and/or online courses available within the 40% cap mentioned by UGC.

VIII.**2 Multiple Exits**: Students will have the flexibility to enter a programme in odd semesters and exit a programme after the successful completion of even semesters as per their future career needs.

- Students exiting the First-Year programme after securing minimum 44 credits will be awarded UG Certificate in the relevant Discipline /Subject provided they secure 8 credits in work-based vocational courses or internship / Apprenticeship offered during summer vacation in addition to 4 credits from skill-based courses earned during the first and second semester.
- Students exiting the Second Year Programme after securing minimum 80 credits will be awarded UG Diploma in the relevant Discipline /Subject provided they secure additional 8 credits in skill-based vocational courses (skill-based courses, internship, mini projects, etc.) offered during summer vacation after the second year.
- Students exiting the 3-year UG program will be awarded B.Voc. in the relevant Discipline /Subject upon securing minimum 120 credits with additional 8 credits in skill-based vocational courses (skill- based courses, internship, mini projects etc.) offered during summer vacation after the sixth semester.
- Exit options shall be provided with Certification, Diploma and B. Vocational degrees to the students at the end of the second, fourth and sixth semester, respectively, in the four-year degree programme. Students will receive a Bachelor's degree with the single minor on successfully completing all eight semesters of the UG Programmes either at a stretch or with opted exits and re- entries. In addition to this, student will receive a Bachelor's degree with Double Minor/Honors/ Research subject to earning additional 18-20 credits.

**VIII.3 Re-entry or Lateral Entry**: Students, opting for exits at any level, will have the option to re-enter the programme from where they had left off, in the same or in a different higher education institution within four years of exit and complete the degree programme within the stipulated maximum period of eight years from the date of admission to first year UG. Re-entry at various levels for lateral entrants in academic programmes shall be based on the earned and valid credits as-deposited and accumulated in the Academic Bank of Credits (ABC) through Registered Higher & Technical Education Institutions (RHTEI) and proficiency test records. Lateral entry into the programme of study leading to the UG Diploma/ B. Vocational/ UG Bachelor's Degree with single minor/ UG Bachelor's Degree with Double Minor/ Honors /Research will be based on the validation of prior learning outcomes achieved and subject to availability based on intake capacity.

**VIII.4 Eligibility for admission to the UG Bachelor's Degree with Double Minor/ Honors /Research as per UGC guidelines**: Minimum CGPA/CPI of 7.5 or minimum 75% after second semester for UG Bachelor's Degree with Double Minor/ Honours and Minimum CGPA/CPI of 7.5 or minimum 75% after sixth semester for UG Bachelor's Degree with Research.

**(A) Guidelines for Award of Double Minor and Honors Degree under 4-Years Bachelor's Degree of Engineering/Technology in Engineering/Technology with Multidisciplinary Minor**

1. A student may be awarded a Double Minor (DM) and Honors (Hons.) Degree under the four year multidisciplinary undergraduate B.E./B.Tech. programme based on the infrastructure available in the Institute, and the student's performance and capability.

2. The Institute may offer the Double Minor and Honors Degree only if a minimum of 15 eligible students opt for a particular Double Minor and Honors programme, and subject to the availability of infrastructure, facilities, and faculty.
3. The option to pursue a Double Minor and Honors Degree is available only to regular students who have successfully completed the first and second semesters with a minimum CGPA of 7.5, and to direct second-year lateral-entry students with a minimum of 75% marks in their Diploma or other qualifying examination, as applicable under the eligibility criteria decided by the competent authority. Students admitted through lateral entry in the third year or fourth/final year will not be eligible to opt for the Double Minor and Honors Degree.

4. Even if award of Double minor and Honors Degree is independent of award of four year multidisciplinary undergraduate B.E./B.Tech Degree Programme but eligibility for progression of Double minor and Honors Degree is based on major degree programme.
5. Although the award of the Double Minor and Honors Degree is independent of the award of the four-year multidisciplinary undergraduate B.E./B.Tech. degree, eligibility for progression in the Double Minor and Honors programme is based on the student's major degree programme.

| Sr. No. | Double Minor/ Hons. courses in | Minimum Eligibility Criteria for offering Double Minor /Hons. Courses |
|---|---|---|
| 1. | Semester III | 1. 44 Credits from all Verticals of Semester I and II without break and in single attempt with minimum 7.5 CGPA.<br>2. Diploma with minimum 75% marks without break and without backlog. |
| 2. | Semester V | 1. 44 Credits from all Verticals of Semester III and IV without break and in single attempt with minimum 7.5 CGPA.<br>2. 8 Credits from Double Minor /Honors Courses.<br>3. Direct Second year admitted students must have cleared bridge courses in single attempt. |
| 3. | Semester VII | 1. 44 Credits from all Verticals of Semester V and VI without break and in single attempt with minimum 7.5 CGPA.<br>2. 16 Credits from Double Minor /Honors Courses. |

6. The student will be eligible for the award of a 4-year Bachelor's degree (B.E./B.Tech.) in Engineering/Technology with a major discipline and Double Minors (Multidisciplinary and Specialization Minors), or a 4-year Bachelor's degree (B.E./B.Tech.) in Engineering / Technology with Honors and a Multidisciplinary Minor, if he/she earns 18 credits in that minor and successfully completes the 4-year Bachelor's degree programme as per the progression mentioned in Paragraph 4, within the stipulated period of four years.

**(B) Guidelines for Award of Honors with Research Degree under 4-Years Bachelor's Degree Engineering/Technology in Engineering/Technology with Multidisciplinary Minor**

1. A student may be awarded Honors with Research degree under the four year multidisciplinary undergraduate B.E./B.Tech. programme based on the infrastructure available in the Institute and the student's performance and capability.
2. The Institute may offer the Honors with Research degree based on the availability of a research centre or research laboratory, and the availability of infrastructure, facilities, and faculty.

3. The option to pursue the Honors with Research degree is available only to regular students who have successfully completed the first to sixth semesters without any break and in a single attempt, with a minimum CGPA of 7.5. For Honors with Research degree, the student shall have to complete a Research Project (on individual basis) of 18 Credits in $7^{th}$ & $8^{th}$ Semester. Also, the student must also have published at least two papers in peer-reviewed journals under the guidance of a faculty member.

4. The student will be eligible for the award of a 4-year Bachelor's degree (B.E./B.Tech.) in Engineering/Technology with a major discipline, Honors with Research, and a Multidisciplinary Minor if he/she earns 18 credits in the seventh and eighth semesters and successfully completes the 4-year Bachelor's degree programme as per the progression mentioned in Paragraph 4, within the stipulated period of four years.

**IX.0 ENROLLMENT AND REGISTRATION OF STUDENTS ON ABC:**

**Creation of ABC ID**: Credits awarded to a student from one program from an institution may be transferred/ redeemed by another institution upon the students consent through ABC. Therefore, it is essential to all students to enroll on ABC, Create ABC ID and share ABC ID with academic institution where he/she admitted.

**Credit Transfer Mechanism**: Credit Transfer Mechanism comprising of Credit Accumulation, Credit Recognition, Credit Redemption and Credit Transfer shall be as prescribed.

**X.0 EXAMINATION AND ASSESSMENT PROCESS:**

i. The basic principle of the Credit framework is that Credits are a function of the successful completion of a program of study/ vocational education/ training and assessment. No Credit can be earned by the student unless the student is assessed for the achievement of the desired competencies and outcome of a program.

ii. Exit options are provided with Certificate, Diploma and Basic Bachelor's degrees to the students at the end of the second, fourth and sixth semesters of a Four Years Multidisciplinary Degree Programme. Students will receive a Bachelor's degree with Honors/ Research on successfully completing of all eight semesters of the UG Program either at a stretch or with opted exits and re- entries.

iii. For the smooth success of four-year degree programme with multiple entry and exit systems, the examination mode should be based on the combination of innovative trends in formative (informal and formal tests administered during the learning process) and summative (evaluation of students learning at the end of an instructional unit) examination modes in line with the UGC Report on 'Evaluation Reforms in Higher Educational Institutions (2019).

**XI.0 EXAMINATION, EVALUATION AND ASSESSMENT SCHEME:**

The Teaching, Learning, Examination, Evaluation and Assessment Scheme shall be as per **Annexure 4** attached herewith the Direction.

**XII.0 CONTINUOUS ASSESSMENT TESTS (CAT):**

For internal assessment, the Continuous Assessment Tests (CAT) shall be conducted as under:-

i. Two CAT each of 15 Marks (Theory) as applicable and 10 Marks based on other teaching evaluation components.

ii. Each concurrent assessment (CAT-I, II & III) will be mapped to relevant Course Learning Outcome.

iii. Total Performance in CAT shall be based on the best two out of three in CAT examinations.

iv. Internal assessment shall be carried out by the respective course teacher by choosing variety of assessment tools/methods such as class test, record book, seminar, case study, field work, mini project work, quiz or any innovative method, which may be deemed to be appropriate for assessing the relevant course outcome.

**XIII.0 CONDUCTION OF THE EXAMINATION:**

As per the scheme of teaching, learning, examination and evaluation, theory/practical examinations of Semester-I, II, III, IV, V, VI, VII and VIII shall be conducted by the University (except for Internal Examinations as applicable) at the end of each semester.

The theory/practical examinations of all the Semesters shall be held as per the following schedule:

| Sr.No. | Name of the Examination | End Semester Examination | Supplementary Examination* |
|---|---|---|---|
| 1 | Semester-I, III, V and VII | Winter | Summer |
| 2 | Semester-II, IV, VI and VIII | Summer | Winter |

* The University may evolve mechanism for conducting repeat end semester examination. Such repeat examinations shall have to be conducted within one month of the regular even semester examination and on demand examination.

1. The practical examination of all semesters shall be conducted by the University at the end of each semester. The University shall conduct the Practical examination of all semesters as per the schedule announced by the University by appointing external and internal examiners.
2. The examinations specified above shall be held twice in a year at such places and on such dates as may be prescribed by the University.
3. An applicant to an examination specified above, shall pursue a regular course of study in courses prescribed for the examination concerned for not less than one semester in a particular semester in a College/ Institute/University department.

4. Provided that the student shall be eligible to appear for examination if -
   a. He/she complies with the provisions of the Ordinance pertaining to the Examination in general from time to time.

b. He/she has prosecuted a regular course of study in a university department/college affiliated to the University.
c. He/she has in the opinion of the Principal shown satisfactory progress in his/her studies.

5. The provisions of Ordinance No. 6 and Ordinance No. 9 shall be mutatis-mutandis applicable to every collegiate/non-collegiate student.
6. The fees for each theory examination and practical examination conducted by the university shall be as prescribed by the University, from time to time.

**XIV.0 COMPUTATION OF SGPA AND CGPA:**

**Letter Grades and Grade Points:**

Computation of SGPA and CGPA shall be on the basis of Credits prescribed to Courses and Grade Points obtained by the student based on scale as mentioned in **Table – 4**:

**TABLE 4: Letter Grades and Grade Points:**

| Semester GPA/ Program CGPA Semester/Program | % of Marks | Alpha-Sign / Letter Grade Result | Grade Point |
|---|---|---|---|
| 9.00-10.00 | 90.0-100 | O (Outstanding) | 10 |
| 8.00 - <9.00 | 80.0 - <90.0 | A+ (Excellent) | 9 |
| 7.00 - <8.00 | 70.0 - <80.0 | A (Very Good) | 8 |
| 6.00 - <7.00 | 60.0 - <70.0 | B+ (Good) | 7 |
| 5.50 - <6.00 | 55.0 - <60.0 | B (Above Average) | 6 |
| 5.00 - <5.50 | 50.0 - <55.0 | C (Average) | 5 |
| 4.00 - <5.00 | 40.0 - <50.0 | P (Pass) | 4 |
| Below 4.00 | Below 40.0 | F (Fail) | 0 |
| Ab (Absent) | - | Ab | 0 |

**Computation of SGPA and CGPA:**
The Semester Grade Point Average (SGPA) is computed from the grades as a measure of the student's performance in a given semester. The SGPA is based on the grades of the current term, while the Cumulative Grade Point Average (CGPA) is based on the grades in all courses taken after joining the programme of study.

**Semester Grade Point Average (SGPA)**: The SGPA is the ratio of the sum of the product of the number of Credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of Credits of all the courses undergone by a student, i.e.

$$SGPA\ (Si) = \sum(Ci \times Gi) / \sum Ci$$

Where Ci is the number of Credits of the ith course and Gi is the grade point scored by the student in the ith course.

**Example for Computation of SGPA:**

| Semester | Course | Credit | Letter Grade | Grade point | Credit Point (Ci x Gi) (Credit x Grade) |
|---|---|---|---|---|---|
| I | Course 1 | 2 | A | 8 | 2 X 8 = 16 |
| I | Course 2 | 2 | B+ | 7 | 2 X 7 = 14 |
| I | Course 3 | 2 | B | 6 | 2 X 6 = 12 |
| I | Course 4 | 2 | O | 10 | 2 X 10 = 20 |
| I | Course 5 | 2 | C | 5 | 2 X 5 = 10 |
| I | Course 6 | 2 | B | 6 | 2 X 6 = 12 |
| | | 12 | | | |
| **SGPA** | | | | | 84/12 = **7.00** |

**Computation of CGPA:**

The Cumulative Grade Point Average (CGPA) is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme, i.e.

$$CGPA = \sum(Ci \times Si) / \sum Ci$$

where Si is the SGPA of the ith semester and Ci is the total number of Credits in that semester.

**Example for Computation of CGPA:**

| Semester I | Semester II | Semester III | Semester IV | Semester V | Semester VI | Semester VII | Semester VIII |
|---|---|---|---|---|---|---|---|
| Credit: 22<br>SGPA:6.9 | Credit: 22<br>SGPA:7.8 | Credit:22<br>SGPA:5.6 | Credit: 22<br>SGPA:6.0 | Credit: 22<br>SGPA: 6.3 | Credit: 22<br>SGPA 8.0 | Credit: 22<br>SGPA 8.0 | Credit: 16<br>SGPA 9.0 |
| CGPA= **7.13** (22 x 6.9 + 22 x 7.8 + 22 x 5.6 + 22 x 6.0 + 22 x 6.3 + 22 x 8.0 + 22 x 8.0 + 16 x 9.0)/170 | | | | | | | |

The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

**XV.0 : EQUIVALENCE OF THE CONVENTIONAL DIVISION/CLASS:**

Equivalence of the conventional division/class to the corresponding C.G.P.A. in final semester shall be in accordance with the **Table**:

**Table 5: Equivalence of Class/Division to C.G.P.A.**

| Sr. No. | C.G.P.A. | Class/Division |
|---|---|---|
| 1. | 7.5 or more than 7.5 | First Class with Distinction |
| 2. | 6.00 or more but less than or equal to 7.49 | First Class |
| 3. | 5.00 or more but less than or equal to 5.99 | Second Class |
| 4. | 4.00 or more but less than or equal to 4.99 | Pass |

**XVI.0 : DECLARATION OF RESULTS:**

1. Declaration of result is based on the Semester Grade Point Average (SGPA) earned towards the end of each semester or the Cumulative Grade Point Average (CGPA) earned at the completion of all eight semesters of the programme and the corresponding overall alpha-sign or letter grades as given in **Table**. If some candidates exit at the completion of the first, second or third year of the Four years Undergraduate Programmes, with Certificate, Diploma or Basic Degree, respectively, then the results of successful candidates at the end of the second, fourth, sixth and eighth semesters shall also be classified on the basis of the CGPA obtained in the two, four, six or eight semesters, respectively.

2. A student obtaining Grade F shall be considered failed and will be required to reappear in the examination. Based on the above recommendations on Letter grades, grade points and SGPA and CGPA, the University shall issue the transcript for each semester and a consolidated transcript indicating the performance in all semesters.

**XVII.0: AWARD OF DEGREE:**

1. A student pursuing Four Year UG programme shall be awarded an appropriate Honors/ Research degree in Major/ Core Subject on completion of VIII Semester with the minimum of 160 Credits if he/she secures in that Subject at least 50% of the total Credits for that programme. He/She shall thus study the specific number of Mandatory Core Courses, Core Electives, Vocational and Skill Courses and Field projects/ Internships connected to Core Subjects in eight semesters, so as to cover at least 50% of the total Credits.

2. In case of Research Degree, student shall have to pursue research project and write dissertation in that Major in the VII and VIII semesters.

3. A student is eligible for the award of Minor Degree on successful completion of Four-years Degree Programme with the minimum of 160 Credits, if he/she earns 18-20 Credits in that Minor Subject. The award of Minor Degree is independent of the award of the Major Degree.

**XVIII.0: RE-ENTRY OR LATERAL ENTRY:**

i. Students, opting for exits at any level, will have the option to re-enter the programme from where they had left off, in the same or in a different higher education institution within four years of exit and complete the degree programme within the stipulated maximum period of eight years from the date of admission to first year UG.

ii. Re-entry at various levels for lateral entrants in academic programmes shall be based on the earned and valid Credits as-deposited and accumulated in the Academic Bank of Credits (ABC) through Registered Higher Education Institutions (RHEI) and proficiency test records. Lateral entry into the programme of study leading to the UG Diploma/ Three-year UG Degree will be based on the validation of prior learning outcomes achieved and subject to availability based on intake capacity.

iii. An unsuccessful examinee at any of the above examination shall carry college assessment marks (Sessional Marks) of the theory/Practical examination to the successive attempt at the examination. The examinee however can go for his/her college assessment marks in the subject or subjects in which he/she shall be examined for total marks comprising of theory and sessional together at his/her successive attempts.

**XIX.0 PROGRESSION TO HIGHER CLASS:**

**Allow To Keep Term (ATKT):**
Eligibility for progression to higher classes shall be as per **Table 1**:

**Table 1: Eligibility for progression to higher classes**

| S.No. | Admission to | Minimum Required Credits |
|---|---|---|
| 1. | Semester III | 28 Credits from all Verticals of Semester I and II |
| 2. | Semester V | Successful completion of Semester I & II with all credits and 28 Credits from all Verticals of Semester III to IV |
| 3. | Semester VII | Successful completion of Semester III & IV with all credits and 28 Credits from all Verticals of Semester V to VI |

A student who could not complete a semester satisfactorily or did not keep term will be eligible for readmission to the same semester. However, readmission to the semester should be allowed only in regular session of that semester. In such case, the candidate will not be eligible to get admission in higher semester.

**XX.0 GENERAL PROVISIONS:**

1. Record of student's Performance cum Evaluation (containing attendance, concept knowledge, intellectual/ decision making ability, handling skill, sense of responsibility, cooperative/leadership quality, presentation / demonstration) related to Internships/ Apprenticeship, Mini-Project, Field Projects /Studio Activities, Community Engagement and Services, etc. shall be maintained by the college/institute/university department.

2. For allotment of Internships/Apprenticeship, Mini-Project, Field Projects /Studio Activities, Community Engagement and Services, etc., the College/ Institute/University Department shall follow Standard Operating Procedures (SOP) with concerned College/Institute/University Department/ Organization/ Industry on the basis of Memorandum of Understanding (MoU) /Letter of Intent and Joining letter. Further, for validation, progress records, Evaluation Sheet etc. shall be maintained by the College/ Institute/ University Department.

3. For award of Credits to Co-curricular Courses: Health and wellness, Yoga Education, Sports and Fitness, Cultural Activities, NSS/NCC, Fine/Applied/Visual/Performing Arts, Academic Activities like paper presentations in conferences, Avishkar, start-ups, Hackathon, Quiz competitions, Article published, Participation in Summer school/ Winter School / Short term course, Scientific Surveys, Societal Surveys, Field Visits, Study tours, Industrial Visits, online/offline Courses on Yoga (Yoga for IQ development, Yoga for Ego development, Yoga for Anger Management, Yoga for Eyesight Improvement, Yoga for Physical Stamina, Yoga for Stress Management, etc.); the college/ Institute / university department should maintain a record of the student.

4. As per Maharashtra Public Universities Act, 2016, Section 89 Chapter VIII, the results of every examination and evaluation conducted by the University will be declared within thirty days from the last date of examination for that particular course and in any case declare the results latest within forty-five days. The names of the examinees passing the examination as a whole in the minimum prescribed period and obtaining the prescribed number of places in the CGPA shall be arranged in order of merit as provided in the examination in general Ordinance no. 6 provided that the merit list only be published in summer examination.

5. An examinee who has completed the term satisfactorily but fails to present himself/herself for the examination shall be eligible for re-admission to the same examination, on payment of fresh fees and other fees as may be prescribed by the university from time to time.

6. A candidate/student who has successfully completed all requisite courses approved by the university and earned minimum prescribed total Credits for which he/she is admitted for the under graduate degree programme and accumulated the required Credits for the program and who has put in the minimum residence time prescribed for each semester of the program shall be eligible to receive the degree.

7. Examinations will be conducted in Offline mode in accordance with Ordinance No.9. However, under special circumstances and in specific cases, those can be conducted in Online mode on the recommendations of Board of Examination & Evaluation and approval by the Academic Council.

8. Generally, and preferably, College/Institute/Department internal assessment examinations and university examinations papers should be set from the Question Bank prepared by the university.

9. Guidelines to Paper Setters are provided in Appendix B, Instructions to BOS in Appendix C, Glossary of Terms in Appendix D and Abbreviations in Appendix E, respectively. Further, at the end of Appendix E, list of references employed to compose this document is furnished.

10. Provisions of Ordinance No. 18/2001 in respect of an Ordinance to provide grace marks for passing in a Head of passing and Improvement of Division (Higher Class) and getting Distinction in the subject and condonation of deficiency of marks in a subject shall apply to the examination under this Direction.

11. The Codes allocated for various subject of different courses are appended as **Appendix – 1.**

**12. Power to modify and remove difficulties:**

(a) Notwithstanding anything contained in the foregoing, Hon'ble Vice-Chancellor in consultation with the Dean of the faculty shall have the power to issue directions or orders to remove any difficulty,

(b) Nothing in the foregoing may be construed as limiting the power of the University to amend, modify or repeal any or all of the above.

13. Task for BoS for effective implementation of NEP is specified in Appendix 10, Glossary of Terms in Appendix 11 and Abbreviations in Appendix 12, respectively.

**XXI.0 NEP WORKING COMMITTEE:**

**A) University Level:**

There shall be NEP working committee in the University comprising of the following members:

1. Pro-Vice Chancellor-Member
2. Deans of all faculties-Members
3. Two Experts not below the rank of Professors - Member nominated by the Honorable Vice-Chancellor
4. IQAC Coordinator- Member- Secretary.

**B. University Department Level:**

There shall be NEP working committee in each university department comprising of the following members:

1. Head of the University Department-Chairman
2. One representative of the University Dept Student Council -Member
3. One Teacher of the Department nominated by Honorable Vice-Chancellor-Member Secretary

**C. College Level:-**

There shall be a NEP working committee in each affiliated college comprising of the following members:-
1. Principal -Chairman
2. HoDs of Teaching Departments of a College- Members
3. One representative of the College Student Council - Member
4. IQAC Coordinator- Member- Secretary.

**POWERS AND DUTIES OF THE NEP WORKING COMMITTEE:**

1. Committee shall take review of the Implementation of the NEP after completion of every Semester
2. The committee shall report to the University about difficulties faced during the implementation of the NEP.
3. The committee should also consider the grievances of the students regarding the difficulties/disadvantages put to them, if any, during their studies under NEP.
4. For college level and university level, the committee will also be a Grievance Redressal Committee for implementation of NEP.
5. The committee may consider any other matter in the interest of the students as far as the NEP is concerned.

**APPENDICES:**
**Appendix 1: Task for Board of Studies for effective implementation of NEP:**

1) The Board of Studies are requested to define and specify the Graduate Attributes (GAs), Program Outcomes (POs) and Program Specific Outcomes (PSOs) for the respective Discipline/Subject.
2) The Board of Studies of all subjects should decide the titles for the following four verticals for all Eight semesters.
3) The Codes for the various types of verticals and the title of the Courses included in each Vertical shall be given by the respective board of Studies with the guidelines of the AICTE and the State Government of Maharashtra.

| Vertical | Particulars | No. of Titles (for all non - lab Courses) | No. of Titles (for all lab Courses) |
|---|---|---|---|
| a | Major Discipline | | |
| | Labs | | |
| | IKS-Subject Specific | | |
| | Electives | | |
| b | Minor | | |
| c | Generic Open Electives | | |
| d | Vocational Courses | | |

| | | | |
|---|---|---|---|
| | Skill Enhancement Courses | | |



4) The board of studies of all subjects of all the four Faculties should finalize the syllabus for the following four verticals for Semester I & II.

| Vertical | Particulars | Syllabus-No. of Titles (for all non - lab Courses) | Syllabus-No. of Titles (for all lab Courses) |
|---|---|---|---|
| A | Major Discipline | | |
| | Labs | | |
| B | Minor | | |
| C | Generic Open Electives | | |
| D | Vocational Courses | | |
| | Skill Enhancement Courses | | |

5) In addition to the above the Board of Studies of all Languages should take care of Value Education Course (VEC). These BoS should decide the titles for all applicable semesters and syllabi for first and second semesters as mentioned below:-

| Vertical | Particulars | No. of Titles | | Syllabus- No. of Titles (Semester I & II) |
|---|---|---|---|---|
| e | AEC | 4 of one Credit each | | |
| | IKS-Generic | 01 title of 02 Credit | | |
| | VEC | 02 titles of 02 Credit each | | |
| f | Internship/ Apprenticeship | Internal | Assessment of these verticals shall be based on various activities / practices. It shall be evaluated by giving maximum marks of 50 per 2 Credit Course with separate activity weightages /levels. A detailed SOP for this assessment process shall be prescribed separately. | |
| | FP/CEP | | | |
| | CC | | | |

6) All Board of Studies should consider Vocational Skill Courses and Skill Enhancement Courses of Laboratory and Practical Nature and should evolve discipline specific teaching-learning modus operandi accordingly. However, classroom type theory courses may also be permissible for this vertical.

7) To evolve codes of various courses for all applicable verticals (a) to (f) the coding system given in **Appendix -1** should be followed.

8) The modus operandi for teaching, learning and evaluation for vertical (f) i.e., Internship, field project and Co-curricular Courses prescribed by NEP task force committee and duly approved by concern authorities will be applicable to all board of studies.

9) Details of Contents, Evaluation and Assessment of Laboratory Course (Practical) shall be prescribed by respective BoS where ever is applicable.

**Appendix 2: GLOSSARY OF THE TERMS:**

- **Academic Credit**: An academic Credit is a unit by which the course work (theory/ practical/ training) is measured. Each course may be allotted Credits in proportion to the time expected to be devoted by the student for that course. Thus, it determines the number of hours of instructions required per week. One Credit means the standard methodology of calculating one hour of theory or one hour of tutorial or two hours of laboratory work or one week of internship per week for a duration of a semester (13-15 weeks) resulting in the award of one Credit; which is awarded by a higher educational institution on which these regulations apply.

- **Academic Bank of Credits (ABC)**: ABC is an academic service mechanism as a digital/virtual/online entity established and managed by MoE/UGC to facilitate students to become its academic account holders and paving the way for seamless student mobility between or within degree granting Higher Education Institutions (HEIs) through a formal system of Credit recognition, Credit accumulation, Credit transfers and Credit redemption to promote distributed and flexible teaching learning.

- **Academic Year**: Two consecutive (one odd + one even) semesters constitute one academic year.
- **Assessment**: It is the process of collecting, recording, scoring, describing and interpreting information about learning

- **Academic Flexibility**: It is the provision for innovative and interchangeable curricular structures to enable creative combinations of Courses/ Programmes in Disciplines of study leading to Degree / Diploma / PG Diploma/Certificate of Study offering multiple entry and multiple exit facilities in tune with National Education Policy-2020, while removing the rigid curricular boundaries and creating new possibilities of life-long learning.
- **Affiliated College**: It implies any higher education institution approved by the affiliating university on the basis of the stipulated norms and guidelines by virtue of which it provides for a course/programme of study for obtaining any qualification from a university.
- **Autonomous College**: It means any institution, whether known as such or by any other name accorded with autonomous status by the UGC upon the recommendations of the affiliating university and the State Government concerned, by virtue of which it provides for a course/programme of study with academic and innovation flexibility for obtaining any qualification from a university and which, in accordance with the Rules and Regulations of such university, is recognized as competent to provide for such course/programme of study and present students undergoing such course/programme of study for the examination leading to the award of such qualification.
- **Choice Based Credit System (CBCS)**: The CBCS provides choice for students to select from the prescribed courses (core major, electives, minor, soft skill courses etc.)
- **Code**: Each course shall bear a distinguishing code (three letters and three digits) that identifies the discipline from which it is being offered.
- **Conventional Mode of Learning**: It means a mode of providing learning opportunities through face to face interaction between the teacher and learner in regular class room environment but does not exclude supplementary instructions if any for the learner through use of online.
- **Core or Major Course**: A course, which should compulsorily be studied by the student as a requirement of core or major subject is termed as a Core Course.
- **Course**: A basic unit of education and/or training. It means a paper which is taught for at least one semester as a part of a subject and is a component of a Programme. All courses need not carry the same weightage. A collection of courses forms a Programme of study.
- **Credit Point**: It is the product of grade point and number of Credits for a course.
- **Cumulative Grade Point Average (CGPA)**: Weighted average of the grade points obtained in all courses registered by the student across semesters.
- **Elective Course**: Generally, a course which can be chosen from a pool of courses and which may be very specific or specialized or advanced or supportive to the discipline/ subject of study or which provides an extended scope or which enables an exposure to some other discipline/subject/domain or nurtures the candidate's proficiency/skill is called an Elective Course.

**Evaluation**: It is the process of making judgments based on evidences and interpretations gathered through examination and assessment and on the basis of agreed upon criteria.

- **Foreign Higher Educational Institution**: It represents a Higher Educational Institution duly established or incorporated or recognized in a foreign country and offering academic and research programmes at the undergraduate and/or higher levels.
- **Generic Elective (GE) or Open Elective (OE) Course**: An elective course chosen generally from an unrelated discipline/subject, with an intention to seek multidisciplinary exposure is called a Generic Elective.
- **Grade Point**: Numeric weightage attached to each letter grade.
- **Grade Point Average (GPA)**: A system of calculating academic achievement based on an average, calculated by multiplying the numerical grade point received in each course by the number of Credits.
- **Graduate Attributes (GAs)**: It is a set of individually assessable outcomes that are indicative of the graduate's potential to acquire competencies in that programme.
- **Higher Education Institutions**: The Higher Education Institutions (HEIs) who are empowered to award degrees by themselves or through their affiliating universities m accordance with Section 22 of the UGC Act, 1956.
- **Lateral Entry**: Lateral entry or admission is granted to those students who have exit after award of Certification, Diploma, or a Basic Bachelor's Degree and are eligible for and desirous of re-entering into the second year/ third year/ fourth year, respectively of same Four-year multidisciplinary degree programme at any ABC registered HEI within stipulated/ permissible period of years as decided by Statutory Councils of that HEI. Lateral entry is also open to those students, if he/she has already successfully completed a multidisciplinary Four-year first degree programme and is desirous of and academically capable of pursuing another multidisciplinary Four-year first degree programme an allied subject.
- **Learning Management System (LMS)**: It means a system to keep track of delivery of e-Learning Programmes, learner's engagement, assessment, results, reporting and other related details in one centralized location
- **Learning Outcome Based Education (LOBE)**: Adherence to student-centric learning approach to measure student's performance based on pre-determined set of outcomes.
- **Letter Grade**: Index of performance resulting from the transformation of actual marks obtained by a student in a course.

- **Major Courses**: The discipline in which the student shall pursue major study in his/her Undergraduate/Master's Programme.
- **Proctored Examination**: It means the examination conducted under the supervision of approved person or technology enabled proctoring which ensures the identity of the test taker and the integrity of the test taking environment, either in pen-paper mode or in computer-based testing mode or in full-fledged online mode, as may be permissible.
- **Programme**: Programme /Programme of study means a higher education programme pursued for a degree specified by the Commission under Section 22 (3) of the UGC Act. It also refers to a collection of courses in which a student enrolls and which contributes to meeting the requirements for the awarding of one or more Certificates/ Diplomas/ Degrees.
- **Programme Education Objectives (PEOs)**: PEOs are broad statements that describes what graduates are expected to attend within few years of graduation.
- Programme Learning Outcomes (PLOs): They represent the knowledge, skills and attitudes a student should attain at the end of the programme.
- **Qualifications**: Qualifications are final 'awards' such as a Certificate, Diploma or Degree.
- Qualifications are awarded by a competent authority such as a college or university in recognition of the attainment by students of the expected learning outcomes on the successful completion of a particular programme of study. Qualifications can also signify the competence to follow an occupational practice.
- **Research Project/ Dissertation**: Project work is considered as a special course involving application of knowledge in solving / analyzing /exploring a real-life situation / difficult problem. The student undertakes research in specific areas of his Major/ Core Subject with an advisory support by a teacher/faculty member.
- **Rubric (Assessment Rubric)**: A rubric for assessment, also called a scoring guide, is a tool used to interpret and grade students on any kind of work against criteria and standards.
- **Semester Grade Point Average (SGPA)**: Performance of a student in a given semester.

- **Appendix 3: ABBREVIATIONS:**

| | |
|---|---|
| ABC | Academic Bank of Credit |
| AEC | Ability Enhancement Courses |
| CC | Co-curricular Courses |
| CAT | Continuous Assessment Test |
| CES | Community Engagement and service |
| DSC | Department Specific Core |
| DSE | Department Specific Elective |
| ES | Environment Studies |
| FSE | Faculty Specific Elective |
| FP | Field projects |
| GE | Generic Electives |
| HEI | Higher Educational Institute |
| IFSC | Inter Faculty Specific Core |
| IKS | Indian Knowledge System |
| Lab | Laboratory |
| MIL | Modern Indian Language |
| MOOC | Massive Online Open Course |
| NCrF | National Credit Framework |
| NEP | National Education Policy |
| OE | Open Electives |
| OJT | On Job Training |
| Pr | Practical/Practicum |
| Prq | Pre-requisite Course |
| RM | Research Methodology |
| RP | Research Project |
| SEC | Skill Enhancement Courses |
| Th | Theory |
| UGC | University Grants Commission |
| VEC | Value Education Courses |
| VEC | Vocational Enhancement Courses |
| VSC | Vocational Skill Courses |
| VSEC | Vocational and Skill Enhancement Courses |

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**23.0 TEACHING LEARNING SCHEME:**

The Schemes of Teaching, Learning, Examination & Evaluation for the verticals of **Semester III to VIII** of all the Under-graduate programmes of Engineering & Technology shall be as per **Appendix – A** appended with this Direction**.**

Date: 10/02/2026

Sd/-
(Dr.Milind Barhate)
Vice-Chancellor
Sant Gadge Baba Amravati University

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**Scheme for Second Year Four Year Undergraduate Engineering Degree Programme**
**B.E. in CIVIL ENGINEERING**
**(Semester-III)**

| SrNo. | CourseName | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total | ESETime Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **CoreCourses** | | | | | | | | | | | | |
| 1 | Strength of Material | 3CE200PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00 Hrs. |
| 2 | Concrete Technology | 3CE201PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00 Hrs. |
| 3 | Building Construction & Materials | 3CE202PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00 Hrs. |
| | **LaboratoryCourses** | | | | | | | | | | | | |
| 4 | Building Construction & Materials (Field Project) | 3CE400EL | 0 | 4 | 0 | 4 | 2 | - | - | 25 | 25 | 50 | - |
| 5 | Strength of Material - Lab | 3CE203PC | 0 | 2 | 0 | 2 | 1 | - | - | 25 | 25 | 50 | - |
| 6 | Concrete Technology - Lab | 3CE204PC | 0 | 2 | 0 | 2 | 1 | - | - | 25 | 25 | 50 | - |
| | **MultidisciplinaryMinor** | | | | | | | | | | | | |
| 7 | Multidisciplinary Minor–I* | 3 -- 205MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00 Hrs. |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 8 | Open Elective-I # | 3 --206OE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00 Hrs. |
| | **HSSMC(Entrepreneurship/ Economics/ManagementCourse)** | | | | | | | | | | | | |
| 9 | Construction Management | 3CE207EM | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00 Hrs. |
| | **ValueEducationCourse(VEC)** | | | | | | | | | | | | |
| 10 | Environmental Science | 3SH208VE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00 Hrs. |
| | **TOTAL** | | 18 | 8 | 0 | 26 | **22** | - | - | - | - | **700** | - |

L: Lecture P: Practical T: Tutorial ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External

**Note:** Suitable number of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42)

# Please refer the basket of open elective courses offered by other major disciplines.
*Please refer the list of Multidisciplinary Minor courses allocated separately by other major discipline.

| Sr No. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total | ESE Time Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **CoreCourses** | | | | | | | | | | | | |
| 1 | Surveying | 4CE209PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00 Hrs. |
| 2 | Transportation Engineering | 4CE210PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00 Hrs. |
| 3 | Building Planning, Designing | 4CE211PC | 2 | 0 | 0 | 2 | 2 | 40 | 60 | - | - | 100 | 3.00 Hrs. |
| | **LaboratoryCourses** | | | | | | | | | | | | |
| 4 | Surveying - Lab | 4CE212PC | 0 | 2 | 0 | 2 | 1 | - | - | 25 | 25 | 50 | - |
| 5 | Transportation Engineering - Lab | 4CE213PC | 0 | 2 | 0 | 2 | 1 | - | - | 25 | 25 | 50 | - |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 6 | Multidisciplinary Minor–II* | 4 --214MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00 Hrs. |
| | **Vocational and Skill Enhancement Courses** | | | | | | | | | | | | |
| 7 | Computer Aided Planning Design | 4CE215VS | 1 | 2 | 0 | 3 | 2 | - | - | 50 | - | 50 | - |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 8 | Open Elective-II # | 4 --216OE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00 Hrs. |
| | **HSSMC(Entrepreneurship/ Economics/Management Course)** | | | | | | | | | | | | |
| 9 | Entrepreneurship in Civil Engineering | 4CE217EM | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00 Hrs. |
| | **Ability Enhancement Course (AEC)** | | | | | | | | | | | | |
| 10 | Modern Indian Language | 4SH218AE | 2 | 0 | 0 | 2 | 2 | - | - | 25 | 25 | 50 | - |
| | **Value Education Course (VEC)** | | | | | | | | | | | | |
| 11 | Universal Human Values & Ethics | 4SH219VE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00 Hrs. |
| | **TOTAL** | | 19 | 06 | 0 | 25 | **22** | - | - | - | - | **700** | - |

L: Lecture P: Practical T: Tutorial MSE: Mid Semester Exam ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External

**Note:** Suitable number of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42)

# Please refer the basket of open elective courses offered by other major disciplines.
*Please refer the list of Multidisciplinary Minor courses allocated separately by other major discipline

## Scheme for Multiple Entry and Exit

| **Exitoption-2 (L5.0): Award of UG Diploma in Major with 88 credits and an additional 8 credits** | | | | |
|---|---|---|---|---|
| **Exit Courses** | | | | |
| 1 | 5CE243EC | Quantity Survey & its equipment's | Online/Offline certification Course | 4 |
| 2 | 5CE244EC | Fundamentals of Structural Analysis | Online/Offline certification Course | 4 |
| **OR** | | | | |
| 3 | 5CE405EL | Internship at Industry | Two months(288-320 hours) | 8 |

| | Scheme for Third Year Four Year Undergraduate Engineering Degree Programme<br>B.E. in CIVIL ENGINEERING(Semester-V) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SrNo.** | **CourseName** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total** | **ESETime Hrs.)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **CoreCourses** | | | | | | | | | | | | |
| 1 | Environmental Engineering | 5CE220PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00Hrs. |
| 2 | Geotechnical Engineering | 5CE221PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00Hrs. |
| 3 | Design of Reinforced Concrete Structure | 5CE222PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00Hrs. |
| 4 | Program Elective Course-I | 5CE223PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 5 | Environmental Engineering-Lab | 5CE224PC | 0 | 2 | 0 | 2 | 1 | - | - | 25 | 25 | 50 | - |
| 6 | Geotechnical Engineering-Lab | 5CE225PC | 0 | 2 | 0 | 2 | 1 | - | - | 25 | 25 | 50 | - |
| 7 | Design of Reinforced Concrete Structure- Lab | 5CE226PC | 0 | 2 | 0 | 2 | 1 | - | - | 25 | 25 | 50 | - |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 8 | Multidisciplinary Minor-III* | 5--227MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00Hrs |
| 9 | Multidisciplinary Minor-IV* | 5--228MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00Hrs |
| 10 | Multidisciplinary Minor Lab-I* | 5--229ML | 0 | 2 | 0 | 2 | 1 | - | - | 25 | 25 | 50 | - |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 11 | Open Elective-III # | 5--230OE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00Hrs. |
| | **TOTAL** | | 18 | 08 | 0 | 26 | **22** | - | - | - | - | **750** | - |

L: Lecture P: Practical T: Tutorial ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External

**Note:** Suitable number of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42)

**PEC-I:** (i) 5CE223PE1-Repair & Rehabilitation of Structure (ii) 5CE223PE2-Waste Water Treatment Technology (iii) 5CE223PE3-Highway Construction & Management

# Please refer the basket of open elective courses offered by other major disciplines.
*Please refer the list of Multidisciplinary Minor courses allocated separately by other major discipline

| | Scheme for Third Year Four Year Undergraduate Engineering Degree Programme B.E. in CIVIL ENGINEERING(Semester-VI) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SrNo.** | **CourseName** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total** | **ESETime Hrs.)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Structural Analysis | 6CE231PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00Hrs. |
| 2 | Fluid Mechanics | 6CE232PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00Hrs. |
| 3 | Design of Steel Structure | 6CE233PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00Hrs. |
| 4 | Program Elective Course-II | 6CE234PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00Hrs. |
| 5 | Program Elective Course-III | 6CE235PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 6 | Computational Structural Analysis-Lab | 6CE236PC | 0 | 2 | 0 | 2 | 1 | - | - | 25 | 25 | 50 | - |
| 7 | Fluid Mechanics-Lab | 6CE237PC | 0 | 2 | 0 | 2 | 1 | - | - | 25 | 25 | 50 | - |
| 8 | Design of Steel Structure-Lab | 6CE238PC | 0 | 2 | 0 | 2 | 1 | - | - | 25 | 25 | 50 | - |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 9 | Multidisciplinary Minor-V* | 6--239MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00Hrs |
| | **Vocational and Skill Enhancement Courses** | | | | | | | | | | | | |
| 10 | Non-Destructive Testing Methods | 6CE240VS | 1 | 2 | 0 | 3 | 2 | - | - | 50 | - | 50 | - |
| | **TOTAL** | | 18 | 08 | 0 | 26 | **22** | - | - | - | - | **750** | - |

L: Lecture P: Practical T: Tutorial ESE: End Semester Exam IE: Internal Evaluation INT: InternalEXT: External

**Note:** Suitable number of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42)

**PEC-II :** (i) 6CE234PE1-Advaned Construction Materials (ii) 6CE234PE2-Solid Waste Management (iii) 6CE234PE3-Airport Planning & Design

**PEC-III:** (i) 6CE235PE1-Advanced Concrete Technology (ii) 6CE235PE2-Ground Improvement Techniques (iii) 6CE235PE3-Solid and Hazardous Waste Management

*Please refer the list of Multidisciplinary Minor courses allocated separately by other major discipline

# Scheme for Multiple Entry and Exit

| Exit option-3(L 5.5): Award of UG Degree in Major with 132 credits and an additional 8 credits | | | | |
|---|---|---|---|---|
| **Exit Courses** | | | | |
| 1 | 7CE310EC | Estimation & Costing | Online/Offline certification Course | 4 |
| 2 | 7CE311EC | Sustainable Construction Methods | Online/Offline certification Course | 4 |
| **OR** | | | | |
| 3 | 7CE406EL | Internship at Industry | Two months (288-320 hours) | 8 |

| | Scheme for Final Year Four Year Undergraduate Engineering Degree Programme B.E. in CIVIL ENGINEERING(Semester-VII) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SrNo.** | **CourseName** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total** | **ESETime Hrs)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **CoreCourses** | | | | | | | | | | | | |
| 1 | Engineering Economics, Estimation& Costing | 7CE300PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00Hrs. |
| 2 | Hydrology &Water Resources Engineering | 7CE301PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00Hrs. |
| 3 | Program Elective Course-IV | 7CE302PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00Hrs. |
| 4 | Program Elective Course-V | 7CE303PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00Hrs. |
| 5 | Program Elective Course-VI | 7CE304PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 6 | Engineering Economics, Estimation& Costing | 7CE305PC | 0 | 2 | 0 | 2 | 1 | - | - | 25 | 25 | 50 | - |
| 7 | Hydrology & Water Resources Engineering | 7CE306PC | 0 | 2 | 0 | 2 | 1 | - | - | 25 | 25 | 50 | - |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 8 | Multidisciplinary Minor–VI* | 7--307MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00Hrs. |
| 9 | Multidisciplinary Minor Lab.–II* | 7--308ML | 0 | 2 | 0 | 2 | 1 | - | - | 25 | 25 | 50 | . |
| | **Project** | | | | | | | | | | | | |
| 10 | Project-Phase I# | 7CE401PR | 0 | 4 | 0 | 4 | 2 | - | - | 100 | - | 100 | - |
| | **TOTAL** | | 17 | 10 | 0 | 27 | **22** | - | - | - | - | **800** | - |

L: Lecture P: Practical T: Tutorial ESE: End Semester Exam IE: Internal Evaluation INT: InternalEXT: External

**Note:** Suitable number of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42)

**PEC-IV:** (i) 7CE302PE1-Intelligent Transportation System (ii) 7CE302PE2-Town Planning (iii) 7CE302PE3-Environmental Impact Assessment

**PEC-V:** (i) 7CE303PE1-Advanced Structural Analysis (ii) 7CE303PE2-Construction Equipment's & automation (iii) 7CE303PE3-Advanced Surveying

**PEC-VI:** (i) 7CE304PE1-Hydraulic Engineering (ii) 7CE304PE2-Contracts Management (iii) 7CE304PE3-Foundation Engineering

*Please refer the list of Multidisciplinary Minor courses allocated separately by other major discipline.

| | Scheme for Final Year Four Year Undergraduate Engineering Degree Programme<br>B.E. in CIVIL ENGINEERING (Semester-VIII) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SrNo.** | **CourseName** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total** | **ESETime Hrs)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Research Methodology | 8CE309RM | 4* | - | - | 4 | 4 | 40 | 60 | - | - | 100 | 3Hrs. |
| 2 | Industry Internship | 8CE402EL | 0 | 24 | 0 | 24 | 12 | - | - | 100 | 200 | 300 | - |
| 3 | Project- Phase II | 8CE403PR | 0 | 4 | 0 | 4 | 2 | - | - | 50 | 50 | 100 | - |
| | TOTAL | | 4 | 28 | 0 | 32 | **18** | - | - | - | - | **500** | - |

L: Lecture P: Practical T: Tutorial ESE: End Semester Exam IE: Internal Evaluation INT: InternalEXT: External

**Note:** Suitable number of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42)

***The course on Research Methodology may be completed by the student in online mode (Swayam, MOOC's, any other platform approved by AICTE OR on the LMS platform offered by the Institute)**

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## Multi-Disciplinary Minor in Civil Engineering

### Multi-Disciplinary Minor Courses (14 Credits) for other Major Disciplines

| Semester | Course Code | Course Type | Credits | | Course name |
|---|---|---|---|---|---|
| | | | T | P | |
| III | 3CE205MD | MDM-1 | 2 | 0 | Introduction to Civil Engineering |
| IV | 4CE214MD | MDM-2 | 2 | 0 | Water Purification and supply |
| V | 5CE227MD | MDM-3 | 2 | 0 | Building Construction and Planning |
| | 5CE228MD | MDM-4 | 2 | 0 | Property Acquisition and Legal aspect |
| | 5CE229ML | MDM-Lab-1 | 0 | 1 | Building Construction and Planning lab |
| VI | 6CE239MD | MDM-5 | 2 | 0 | Advance building material |
| VII | 7CE307MD | MDM-6 | 2 | 0 | Estimating and Costing |
| | 7CE308ML | MDM-Lab-2 | 0 | 1 | Estimating and Costing lab |
| **Total** | | | **12** | **02** | |

## Open Electives of Civil Engineering

### Open Elective Courses for other Major Disciplines

| Semester | Course Code | Credits | | Course name |
|---|---|---|---|---|
| | | T | P | |
| III | 3CE206OE1 | 3 | 0 | Disaster Management |
| | 3CE206OE2 | 3 | 0 | Water Resources Management |
| | 3CE206OE3 | 3 | 0 | Air and Noise Pollution Control Engineering |
| IV | 4CE216OE1 | 2 | 0 | Fundamental of Vastushastra |
| | 4CE216OE2 | 2 | 0 | Infrastructure Planning and Management |
| | 4CE216OE3 | 2 | 0 | Principles of Management |
| V | 5CE230OE1 | 2 | 0 | Introduction to Earthquake Engineering |
| | 5CE230OE2 | 2 | 0 | Green Building |
| | 5CE230OE3 | 2 | 0 | Construction Safety Management |

## List of Courses for Double Minor / Honours in "Smart City"

**To be offered as Honours for Civil Engineering Discipline for other major discipline it may be offered as Double Minor**

| Sr. No. | Course Code | Semester | Credits | Course Name |
|---|---|---|---|---|
| 1 | 3CE245DH1 | III | 4 | Smart cities and urban innovation |
| 2 | 4CE246DH1 | IV | 4 | Smart City Infrastructure & Digital Integration |
| 3 | 5CE247DH1 | V | 4 | Smart Mobility and Transportation system |
| 4 | 6CE248DH1 | VI | 4 | Green Technology |
| 5 | 7CE407DH1 | VII | 2 | Minor Project on Smart Cities |
| | | **Total** | **18** | |

**OR**

## List of Courses for Double Minor / Honours in "Sustainability Engineering"

**To be offered as Honours for Civil Engineering Discipline for other major discipline it may be offered as Double Minor**

| Sr. No. | Course Code | Semester | Credits | Course Name |
|---|---|---|---|---|
| 1 | 3CE245DH2 | III | 4 | Elements of Sustainable Engineering |
| 2 | 4CE246DH2 | IV | 4 | Renewable Energy |
| 3 | 5CE247DH2 | V | 4 | Sustainable Mobility solutions |
| 4 | 6CE248DH2 | VI | 4 | Sustainable and Green Construction |
| 5 | 7CE407DH2 | VII | 2 | Minor Project on Sustainability Engineering |
| | | **Total** | **18** | |

Eligible students may complete these requirements by enrolling in approved MOOCs via SWAYAM/NPTEL, ensuring fulfillment of the required 18 credits and academic standards as approved by BOS.

**List of Courses for B.E. Civil Engineering Honours with Research Degree**

| Sr. No. | Course Code | Proposed in Semester | Credits | Course name |
|---|---|---|---|---|
| 1 | 7CE408HR | VII | 9 | Research Project (Part 1) Problem Identification and definitions, Literature Review, Experimental Work |
| 2 | 8CE409HR | VIII | 9 | Research Project (Part 2) Prototype Development, Data Analysis, Publication |
| | | **Total** | **18** | |

## Nomenclature: Name of Department offering the courses

| Acronym | Discipline of engineering/Department offering the course |
|---|---|
| SH | Science and Humanities |
| ME | Mechanical Engineering |
| EE | Electrical Engineering |
| CS | Computer Science and Engineering |
| CE | Civil Engineering |
| IT | Information Technology |
| ET | Electronics & Telecommunication Engg. |
| TX | Textile Engineering |
| EP | Electrical (Electronics & Power) Engg. |
| AD | Artificial Engineering and Data Science |
| CH | Chemical Engineering |
| DS | CSE (Data Science) |

## Courses

| Acronym | Course/Subject Vertical |
|---|---|
| BS | Basic Science Course |
| BL | Basic Science Laboratory |
| ES | Engineering Science Course |
| EL | Experiential Learning |
| PC | Program Course |
| PL | Program Laboratory |
| PE | Program Elective Course |
| MD | Multidisciplinary Minor Course |
| ML | Multidisciplinary Minor Laboratory |
| OE | Open Elective |
| EC | Exit Course |
| DH | Double Minor / Hons. Courses |

| Acronym | Course/Subject Vertical |
|---|---|
| VS | Vocational Skill Enhancement Course |
| AE | Ability Enhancement Course |
| EM | Entrepreneurship/Economics/Management Course |
| IK | Indian Knowledge System |
| VE | Value Education Course |
| RM | Research Methodology |
| FP | Field Project |
| II | Industry Internship |
| PR | Project |
| CC | Co-curricular Course |
| AL | All (Common for all Branches) |
| HR | Honours with Research |

## Scheme for Second Year Four Year Undergraduate Engineering Degree Programme
## B.E. in MECHANICAL ENGINEERING
## (Semester -III)

| Sr No. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total | ESE Time Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Engineering Thermodynamics (PCC-I) | 3ME200PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 2 | Manufacturing Technology (PCC-II) | 3ME201PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 3 | Mechanics of Materials (PCC-III) | 3ME202PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 4 | Comm. Engg. Project/ Field Project | 3ME400EL | 0 | 4 | 0 | 4 | 2 | | | 25 | 25 | 50 | |
| 5 | Manufacturing Technology (PCC-II) | 3ME203PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 6 | Mechanics of Materials (PCC-III) | 3ME204PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 7 | Multidisciplinary Minor –I* | 3ME205MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00 Hrs. |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 8 | Open Elective -I | 3ME206OE 1/2/3 | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00 Hrs. |
| | **HSSMC (Entrepreneurship/ Economics/ Management Course)** | | | | | | | | | | | | |
| 9 | Entrepreneurship Development | 3ME207EM | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00 Hrs. |
| | **Value Education Course (VEC)** | | | | | | | | | | | | |
| 10 | Environmental Science | 3SH208VE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | TOTAL | | 17 | 10 | 0 | 27 | **22** | | | | | **700** | |

**L: Lecture P: Practical T: Tutorial MSE: Mid Semester Exam ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External Note:** Suitable number of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours) **Open Elective-I: 3ME206OE1**- Power Plant Engineering **3ME206OE2**- Engineering Materials **3ME206OE3**- Manufacturing Processes

***Please refer to the list of Multidisciplinary Minor courses attached separately.**

| | Scheme for Second Year Four Year Undergraduate Engineering Degree Programme<br>B.E. in MECHANICAL ENGINEERING (Semester -IV) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sr No. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total | ESE Time Hrs.) |
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Material Science (PCC-I) | 4ME209PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 2 | Fluid Mechanics (PCC-II) | 4ME210PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 3 | Energy Conversion – I (PCC-III) | 4ME211PC | 2 | 0 | 0 | 2 | 2 | 40 | 60 | | | 100 | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 4 | Material Science (PCC-I) | 4ME212PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 5 | Fluid Mechanics (PCC-II) | 4ME213PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 6 | Multidisciplinary Minor –II* | 4ME214MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00 Hrs. |
| | **Vocational and Skill Enhancement Courses** | | | | | | | | | | | | |
| 7 | Computational Methods and Programming | 4ME215VS | 1 | 2 | 0 | 3 | 2 | | | 50 | - | 50 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 8 | Open Elective- II | 4ME216OE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | **HSSMC (Entrepreneurship/ Economics/ Management Course)** | | | | | | | | | | | | |
| 9 | Principles of Economics and Management | 4ME217EM | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | **(Ability Enhancement Course (AEC)** | | | | | | | | | | | | |
| 10 | Modern Indian Language | 4SH218AE | 2 | 0 | 0 | 2 | 2 | | | 25 | 25 | 50 | . |
| | **Value Education Course (VEC)** | | | | | | | | | | | | |
| 11 | Universal Human Values & Ethics | 4SH219VE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | TOTAL | | 19 | 06 | 0 | 25 | **22** | | | | | **700** | |

**L: Lecture P: Practical T: Tutorial MSE: Mid Semester Exam ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External Note:** Suitable number of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours) **Open Elective-II: 1)** Automotive Technology 2) Sustainable Energy 3) Business Planning and Project Management

***Please refer list of Multidisciplinary Minor courses attached separately.**

**Scheme for Multiple Entry and Exit**

| **Exit option -2 (Level 5.0): Award of UG Diploma in Major with 88 credits and an additional 8 credits** | | | | |
|---|---|---|---|---|
| **Exit Courses** | | | | |
| **SN** | **Course Code** | **Name of the Course** | **Mode** | **Credits** |
| 1 | 5ME243EC | Industrial Safety Engineering | Online Certification Course | 4 |
| 2 | 5ME244EC | Quality Control and Inspection | Online Certification Course | 4 |
| | **OR** | | | |
| 3 | 5ME405EL | Internship at Industry OR Minor Project | Two Months (288 – 320 Hours) | 8 |

| | Scheme for Second Year Four Year Undergraduate Engineering Degree Programme B.E. in MECHANICAL ENGINEERING (Semester -V) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sr No. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total | ESE Time Hrs.) |
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Heat Transfer (PCC-I) | 5ME220PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 2 | Theory of Machines (PCC-II) | 5ME221PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 3 | Measurement Systems (PCC-III) | 5ME222PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 4 | Programme Elective Course -I | 5ME223PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 5 | Heat Transfer (PCC-I) | 5ME224PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 6 | Theory of Machines (PCC-II) | 5ME225PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Measurement Systems (PCC-III) | 5ME226PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 8 | Multidisciplinary Minor –III* | 5ME227MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| 9 | Multidisciplinary Minor –IV* | 5ME228MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| 10 | Multidisciplinary Minor Lab. –I* | 5ME229ML | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 11 | Open Elective- III | 5ME230OE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | TOTAL | | 19 | 08 | 0 | 26 | **22** | | | | | **750** | |

**L: Lecture P: Practical T: Tutorial MSE: Mid Semester Exam ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External**

**Note:** Suitable number of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

| PEC | Thermal Engineering Stream (A) | Manufacturing Engineering Stream (B) | Design Engineering Stream (C) |
|---|---|---|---|
| PEC **-I** | Non-conventional Energy Sources | Productivity Techniques | Computer Aided Design & Simulation |

**Open Elective –III: 1)** Optimization Techniques 2) Industrial Robotics & Automation 3) Introduction to 3D Printing

***Please refer list of Multidisciplinary Minor courses attached separately.**

## Scheme for Second Year Four Year Undergraduate Engineering Degree Programme
### B.E. in MECHANICAL ENGINEERING
### (Semester -VI)

| Sr No. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total | ESE Time Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Design of Machine Elements (PCC-I) | 6ME231PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 2 | Metrology & Quality Control (PCC-II) | 6ME232PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 3 | Hydraulic Machines (PCC-III) | 6ME233PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 4 | Program Elective Course -II | 6ME234PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 5 | Program Elective Course -III | 6ME235PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 6 | Design of Machine Elements (PCC-I) | 6ME236PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Metrology & Quality Control (PCC-II) | 6ME237PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 8 | Hydraulic Machines (PCC-III) | 6ME238PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 9 | Multidisciplinary Minor –V* | 6ME239MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | **Vocational and Skill Enhancement Courses** | | | | | | | | | | | | |
| 10 | Design Analysis and Simulation Lab | 6ME240VS | 1 | 2 | 0 | 3 | 2 | | | 50 | - | 50 | |
| | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **750** | |

**L: Lecture** **P: Practical** **T: Tutorial** **ESE: End Semester Exam** **IE: Internal Evaluation INT: Internal** **EXT: External**

**Note:** Suitable number of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

*Please refer list of Multidisciplinary Minor courses attached separately: 6ME239MD

| PEC | Course Code | Thermal Engineering Stream (A) | Course Code | Manufacturing Engineering Stream (B) | Course Code | Design Engineering Stream (C ) |
|---|---|---|---|---|---|---|
| PEC **-II** | 6ME239MD-A1 | Internal Combustion Engines | 6ME239MD-B1 | Computer Aided Manufacturing | 6ME239MD-C1 | Tool Design |
| PEC **-III** | 6ME239MD-A2 | Computational Fluid Dynamics | 6ME239MD-B2 | Project Management | 6ME239MD-C2 | Product Design and Development |

**Scheme for Multiple Entry and Exit**

| **Exit option -3 (Level 5.5): Award of UG Degree in Major with 132 credits and an additional 8 credits** | | | | |
|---|---|---|---|---|
| **Exit Courses** | | | | |
| **SN** | **Course Code** | **Name of the Course** | **Mode** | **Credits** |
| 1 | 7ME310EC | A. CNC Programming Techniques & Practice OR<br>B. Ventilation & Air Conditioning System Design (HVAC) OR<br>C. Industrial Piping Engineering | Online Certification Course | 4 |
| 2 | 7ME311EC | Certified Mechanical Software Course on CFD or FEA Software or SolidWorks or CREO or CATIA or NXCAD or INVENTOR Design Course | Online Certification Course | 4 |
| | **OR** | | | |
| 3 | 7ME406EL | Internship at Industry OR Minor Project | Two Months (288 -320 Hours) | 8 |

## Scheme for Second Year Four Year Undergraduate Engineering Degree Programme
### B.E. in MECHANICAL ENGINEERING
### (Semester -VII)

| Sr No. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total | ESE Time Hrs) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Energy Conversion-II (PCC-I) | 7ME300PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 2 | Automation Engineering (PCC-II) | 7ME301PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 3 | Program Elective Course -IV | 7ME302PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 4 | Program Elective Course -V | 7ME303PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 5 | Program Elective Course -VI | 7ME304PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 6 | Energy Conversion-II (PCC-I) | 7ME305PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Automation Engineering (PCC-II) | 7ME306PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 8 | Multidisciplinary Minor –VI* | 7ME307MD | 2 | 0 | 0 | 2 | 2 | 30 | 30 | | | 50 | 2.00 Hrs. |
| 9 | Multidisciplinary Minor Lab. –II* | 7ME308ML | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | . |
| | **Project** | | | | | | | | | | | | |
| 10 | Project | 7ME401PR | 0 | 4 | 0 | 4 | 2 | | | 50 | 50 | 100 | |
| | TOTAL | | 17 | 10 | 0 | 27 | **22** | | | | | **800** | |

**L: Lecture** **P: Practical** **T: Tutorial** **ESE: End Semester Exam** **IE: Internal Evaluation** **INT: Internal** **EXT: External**

**Note:** Suitable number of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

***Please refer list of Multidisciplinary Minor courses attached separately: 7ME307MD**

| PEC | Course Code | Thermal Engineering Stream (A) | Course Code | Manufacturing Engineering Stream (B) | Course Code | Design Engineering Stream (C ) |
|---|---|---|---|---|---|---|
| PEC **-IV** | 7ME307MD-A1 | Automobile Engineering | 7ME307MD-B1 | Supply Chain Management | 7ME307MD-C1 | Finite Element Analysis |
| PEC **-V** | 7ME307MD-A2 | Energy Conservation and Management | 7ME307MD-B2 | Operation Research and Techniques | 7ME307MD-C2 | Mechatronics |
| PEC **-VI** | 7ME307MD-A3 | Refrigeration and Air-conditioning | 7ME307MD-B3 | Additive Manufacturing | 7ME307MD-C3 | Robotics and Industrial Applications |

| | **Scheme for Second Year Four Year Undergraduate Engineering Degree Programme B.E. in MECHANICAL ENGINEERING (Semester -VIII)** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sr No.** | **Course Name** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total** | **ESE Time Hrs)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **Core Courses** | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 1 | Research Methodology | 8ME309RM | 4* | | | 4 | 4 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 2 | Industry Internship | 8ME402EL | 0 | 24 | 0 | 24 | 12 | | | 100 | 200 | 300 | -- |
| 3 | Project | 8ME403PR | 0 | 4 | 0 | 4 | 2 | | | 50 | 50 | 100 | --. |
| | TOTAL | | 4 | 28 | 0 | 32 | 18 | | | | | **500** | |

**L: Lecture** **P: Practical** **T: Tutorial** **ESE: End Semester Exam** **IE: Internal Evaluation** **INT: Internal** **EXT: External**

**Note:** Suitable number of *The course on Research Methodology may be completed by the student in Online mode (Swayam, MOOC's, any other platform approved by AICTE OR on the LMS platform
offered by the Institute).

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B. E. Mechanical Engineering

## Multi -Disciplinary Minor Courses (14 Credits)

| SEM | Course Code | Course Type | Course Title | Credit | | Options | | |
|---|---|---|---|---|---|---|---|---|
| | | | | T | P | A | B | C |
| Sem III | 3ME205MD | MDM –I | Basics of Mechanical Engineering | 2 | 0 | Industrial Piping Engineering | Advanced Excel | Industrial Accounting |
| Sem IV | 4ME214MD | MDM -II | Fluid Mechanics and Machines | 2 | 0 | Ergonomics | Enterprise Resource Planning | Industrial Safety Engineering |
| Sem V | 5ME227MD | MDM -III | Engineering Thermodynamics | 2 | 0 | Basics of Electrical Drives | Industrial IoT | Material Management |
| | 5ME228MD | MDM -IV | Manufacturing Technology | 2 | 0 | Green Energy Systems | Industry 4.0 | Product Lifecycle Management |
| | 5ME229ML | MDM Lab. -I | Computer Aided Design and Drafting Lab | 0 | 1 | Essential of Data Science | Problem solving using Python | MATLAB for Engineers |
| Sem VI | 6ME239MD | MDM -V | *Sem. VI: PEC-II/PEC-III | 2 | 0 | Hybrid EV Design & Analysis | AI for Mechanical Engineers | Human Resource Management |
| Sem VII | 7ME307MD | MDM -VI | **Sem. VII: PEC-IV/PEC-V/PEC-VI | 2 | 0 | Introduction to Nano Technology | Introduction to 3D Printing | Digital Marketing and E-commerce |
| | 7ME308ML | MDM Lab. -II | Thermal Engineering Lab. | 0 | 1 | Animation & Motion Graphics | Digital Content Creation | Interactive Presentations |
| | | | **Total** | **12** | **02** | | | |

***6ME239MD: Multi-disciplinary Minor –V**

(Note: Select any one course from the below list of Program Electives: PEC-II or PEC-III)

| **PEC** | **Thermal Engineering Stream (A)** | **Manufacturing Engineering Stream (B)** | **Design Engineering Stream (C )** |
|---|---|---|---|
| PEC **-II** | Internal Combustion Engines | Computer Aided Manufacturing | Tool Design |
| PEC **-III** | Computational Fluid Dynamics | Project Management | Product Design and Development |

****7ME307MD: Multi-disciplinary Minor –VI**

(Note: Select any one course from the below list of Program Electives: PEC-IV/PEC-V/PEC-VI)

| **PEC** | **Thermal Engineering Stream (A)** | **Manufacturing Engineering Stream (B)** | **Design Engineering Stream (C)** |
|---|---|---|---|
| PEC **–IV** | Automobile Engineering | Supply Chain Management | Finite Element Analysis |
| PEC **-V** | Energy Conservation and Management | Operation Research and Techniques | Mechatronics |
| PEC **-VI** | Refrigeration and Air-conditioning | Additive Manufacturing | Robotics and Industrial Applications |

**Honors / Double Minors / Honors with Research Degree Programme – 18 Credits**

- **Eligibility:** Those students, who have cleared (Pass) first two semesters' university examinations (Semester I & II) with CGPA 7.5 & higher marks
- **Courses:** The five courses will be required to be qualify from Semester III to Semester -VII
- **Subjects:** The candidates need to complete four (4) theory subjects during semester -III to Semester -VI and one (1) Capstan project during Semester -VII
- **Execution:** The examination will be conducted by the University for all the Theory subjects / If candidates are permitted to complete the project in online mode on any MOOC's platform, then examination will be conducted by respective course conduction body or organization.
- **Verticals:** It is decided to have maximum two (2) tracks under each BoS (Board of Studies)

**Suggestive List of Verticals in Mechanical Engineering (which will be finalized by the BoS)**

- Advance Thermal Engineering
- Robotics & Automation
- Additive Manufacturing
- Electric Vehicle
- Business Development Marketing & Finance
- Logistic Management

**Subject code for Honors / Double Minors Programme**

**Vertical -I** **Vertical -II**

| SN | Semester | Subject Code | | SN | Semester | Subject Code |
|---|---|---|---|---|---|---|
| 1. | Semester -3 | 3ME245DH1 | | 1. | Semester -3 | 3ME245DH2 |
| 2. | Semester -4 | 4ME246DH1 | | 2. | Semester -4 | 4ME246DH2 |
| 3. | Semester -5 | 5ME247DH1 | | 3. | Semester -5 | 5ME247DH2 |
| 4. | Semester -6 | 6ME248DH1 | | 4. | Semester -6 | 6ME248DH2 |
| 5. | Semester -7 | 7ME407DH1 | | 5. | Semester -7 | 7ME407DH2 |

**Subject code for Honors with Research Programme**

7 ME 408 HR and 8ME409HR

## Nomenclature: Name of Department offering the courses

| Acronym | Discipline of engineering/Department offering the course |
|---|---|
| SH | Science and Humanities |
| ME | Mechanical Engineering |
| EE | Electrical Engineering |
| CS | Computer Science and Engineering |
| CE | Civil Engineering |
| IT | Information Technology |
| ET | Electronics & Telecommunication Engg. |
| TX | Textile Engineering |
| EP | Electrical (Electronics & Power) Engg. |
| AD | Artificial Engineering and Data Science |
| CH | Chemical Engineering |
| DS | CSE (Data Science) |

| Courses | |
|---|---|
| **Acronym** | **Course/Subject Vertical** |
| BS | Basic Science Course |
| BL | Basic Science Laboratory |
| ES | Engineering Science Course |
| EL | Engineering Science Laboratory |
| PC | Program Course |
| PL | Program Laboratory |
| PE | Program Elective Course |
| M | Multidisciplinary Minor Course |
| ML | Multidisciplinary Minor Laboratory |
| OE | Open Elective |

| Acronym | Course/Subject Vertical |
|---|---|
| VS | Vocational Skill Enhancement Course |
| AE | Ability Enhancement Course |
| EM | Entrepreneurship/Economics/Management Course |
| IK | Indian Knowledge System |
| VE | Value Education Course |
| RM | Research Methodology |
| FP | Field Project |
| II | Industry Internship |
| PR | Project |
| CC | Co-curricular Course |

## Scheme for Second Year Four Year Undergraduate Engineering Degree Programme
## B.E. in ELECTRONICS AND TELECOMMUNICATION ENGINEERING
## (Semester -III)

| Sr No. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total | ESE Time Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Electronics Devices & Circuits (PCC-I) | 3ET200PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 2 | Electro Magnetic Waves (PCC-II) | 3ET201PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 3 | Signals & Systems (PCC-III) | 3ET202PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 4 | Comm. Engg. Project/ Field Project | 3ET400EL | 0 | 4 | 0 | 4 | 2 | | | 25 | 25 | 50 | |
| 5 | Electronics Devices & Circuits Lab (PCC-II) | 3ET203PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 6 | Signals & Systems Lab (PCC-III) | 3ET204PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 7 | Multidisciplinary Minor –I* | 3ET205MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00 Hrs. |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 8 | Open Elective -I | 3ET206OE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00 Hrs. |
| | **HSSMC (Entrepreneurship/ Economics/ Management Course)** | | | | | | | | | | | | |
| 9 | Entrepreneurship Development | 3ET207EM | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00 Hrs. |
| | **Value Education Course (VEC)** | | | | | | | | | | | | |
| 10 | Environmental Science | 3AL208VE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | TOTAL | | 17 | 10 | 0 | 27 | **22** | | | | | **700** | |

L: Lecture P: Practical T: Tutorial MSE: Mid Semester Exam ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External

**Note:** Six hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 34 Hours)

**Open Elective-I: 1) Analog Communication 2) Digital Communication**

***Please refer to the list of Multidisciplinary Minor courses attached separately.**

## Scheme for Second Year Four Year Undergraduate Engineering Degree Programme
## B.E. in ELECTRONICS AND TELECOMMUNICATION ENGINEERING (Semester -IV)

| Sr No. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total | ESE Time Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Analog & Digital Communications (PCC-I) | 4ET209PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 2 | Analog Circuits (PCC-II) | 4ET210PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 3 | Network Theory (PCC-III) | 4ET211PC | 2 | 0 | 0 | 2 | 2 | 40 | 60 | | | 100 | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 4 | Analog & Digital Communications Lab (PCC-I) | 4ET212PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 5 | Analog Circuits Lab (PCC-II) | 4ET213PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 6 | Multidisciplinary Minor –II* | 4ET214MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00 Hrs. |
| | **Vocational and Skill Enhancement Courses** | | | | | | | | | | | | |
| 7 | VSEC-III: Object Oriented Programming | 4ET215VS | 1 | 2 | 0 | 3 | 2 | | | 50 | - | 50 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 8 | Open Elective- II | 4ET216OE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | **HSSMC (Entrepreneurship/ Economics/ Management Course)** | | | | | | | | | | | | |
| 9 | Management Related: Engg. Economics | 4ET217EM | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | **(Ability Enhancement Course (AEC)** | | | | | | | | | | | | |
| 10 | Modern Indian Language | 4AL218AE | 2 | 0 | 0 | 2 | 2 | | | 25 | 25 | 50 | . |
| | **Value Education Course (VEC)** | | | | | | | | | | | | |
| 11 | Environmental Science/UHV/VE | 4AL219VE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | TOTAL | | 19 | 06 | 0 | 25 | **22** | | | | | **700** | |

L: Lecture P: Practical T: Tutorial MSE: Mid Semester Exam ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External

**Note:** Six hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 34 Hours)

**Open Elective-II: 1) Optical Fiber Communication 2) Satellite Communication**

***Please refer list of Multidisciplinary Minor courses attached separately.**

**Scheme for Multiple Entry and Exit**

| **Exit option -2 (Level 5.0): Award of UG Diploma in Major with 88 credits and an additional 8 credits** | | | | |
|---|---|---|---|---|
| **Exit Courses** | | | | |
| 1 | 5ET243EC | Microprocessors/Microcontrollers based Product Design | Online Certification Course | 4 |
| 2 | 5ET244EC | PCB Design and Circuit Simulation | Online Certification Course | 4 |
| | | **OR** | | |
| 3 | 5ET405EL | Internship at Industry OR Minor Project | Two Months (288 – 320 Hours) | 8 |

## Scheme for Second Year Four Year Undergraduate Engineering Degree Programme
## B.E. in ELECTRONICS AND TELECOMMUNICATION ENGINEERING
## (Semester -V)

| Sr No. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total | ESE Time Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Microcontroller (PCC-I) | 5ET220PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 2 | Digital Signal Processing (PCC-II) | 5ET221PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 3 | Communication Network (PCC-III) | 5ET222PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 4 | Programme Elective Course -I: Power Electronics/Wireless Sensor Networks/Electric Vehicles | 5ET223PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 5 | Microcontroller Lab (PCC-I) | 5ET224PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 6 | Digital Signal Processing Lab (PCC-II) | 5ET225PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Communication Network Lab (PCC-III) | 5ET226PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 8 | Multidisciplinary Minor –III* | 5ET227MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| 9 | Multidisciplinary Minor –IV* | 5ET228MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| 10 | Multidisciplinary Minor Lab. –I* | 5ET229ML | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 11 | Open Elective- III | 5ET230OE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | TOTAL | | 19 | 08 | 0 | 26 | **22** | | | | | **750** | |

L: Lecture P: Practical T: Tutorial MSE: Mid Semester Exam ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External

**Note:** Six hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 34 Hours

**Open Elective –III: 1) Introduction to Wireless Communication 2) Introduction to 5G-6G**

*Please refer list of Multidisciplinary Minor courses attached separately.

## Scheme for Second Year Four Year Undergraduate Engineering Degree Programme
### B.E. in ELECTRONICS AND TELECOMMUNICATION ENGINEERING
### (Semester -VI)

| Sr No. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total | ESE Time Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Digital Image Processing (PCC-I) | 6ET231PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 2 | Embedded Systems (PCC-II) | 6ET232PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 3 | UHF & Microwave Engineering (PCC- III) | 6ET233PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 4 | Program Elective Course -II: Control Systems/Introduction to AI/Satellite Communications | 6ET234PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 5 | Program Elective Course -III: Computer Architecture/Introduction to Machine Learning/Antenna & Wave Propagation | 6ET235PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 6 | Digital Image Processing Lab (PCC-I) | 6ET236PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Embedded Systems Lab (PCC-II) | 6ET237PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 8 | UHF & Microwave Engineering Lab (PCC-III) | 6ET238PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 9 | Multidisciplinary Minor –V* | 6ET239MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | **Vocational and Skill Enhancement Courses** | | | | | | | | | | | | |
| 10 | VSEC-IV (Technical Dept. Specific): Introduction to Python | 6ET240VS | 1 | 2 | 0 | 3 | 2 | | | 50 | - | 50 | |
| | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **750** | |

L: Lecture P: Practical T: Tutorial ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External

Note: Six hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 34 Hours)

***Please refer list of Multidisciplinary Minor courses attached separately.**

**Scheme for Multiple Entry and Exit**

| **Exit option -3 (Level 5.5): Award of UG Degree in Major with 132 credits and an additional 8 credits** | | | | |
|---|---|---|---|---|
| **Exit Courses** | | | | |
| 1 | 7ET310EC | Certified Database Engineer (Oracle, DB2) | Online Certification Course | 4 |
| 2 | 7ET311EC | Certified Cloud Engineer (AWS, AZURE) | Online Certification Course | 4 |
| | | **OR** | | |
| 3 | 7ET406EL | Internship at Industry OR Minor Project | Two Months (288 -320 Hours) | 8 |

**Scheme for Second Year Four Year Undergraduate Engineering Degree Programme**
**B.E. in ELECTRONICS AND TELECOMMUNICATION ENGINEERING**
**(Semester -VII)**

| Sr No. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total | ESE Time Hrs) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | VLSI (PCC-I) | 7ET300PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 2 | Wireless Communications (PCC-II) | 7ET301PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 3 | Program Elective Course -IV: MEMS/Cloud Computing/Optic Fiber Communications | 7ET302PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 4 | Program Elective Course -V: Introduction to IOT/ Introduction to 5G – 6G / Information Theory & Coding | 7ET303PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 5 | Program Elective Course -VI: Biomedical Engineering/ Smart Sensors & Actuators/ Industrial Automation | 7ET304PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 6 | VLSI Lab (PCC-I) | 7ET305PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | IOT Lab (PCC-II) | 7ET306PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 8 | Multidisciplinary Minor –VI* | 7ET307MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| 9 | Multidisciplinary Minor Lab. –II* | 7ET308ML | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | . |
| | **Project** | | | | | | | | | | | | |
| 10 | Project | 7ET401PR | 0 | 4 | 0 | 4 | 2 | | | 50 | 50 | 100 | |
| | TOTAL | | 17 | 10 | 0 | 27 | **22** | | | | | **800** | |

L: Lecture P: Practical T: Tutorial ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External

**Note:** Six hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 34 Hours)

| | Scheme for Second Year Four Year Undergraduate Engineering Degree Programme<br>B.E. in ELECTRONICS AND TELECOMMUNICATION ENGINEERING<br>(Semester -VIII) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sr No.** | **Course Name** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total** | **ESE Time Hrs)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **Core Courses** | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 1 | Research Methodology | 8ET309RM | 4* | | | 4 | 4 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 2 | Industry Internship | 8ET402EL | 0 | 24 | 0 | 24 | 12 | | | 100 | 200 | 300 | -- |
| 3 | Project | 8ET403PR | 0 | 4 | 0 | 4 | 2 | | | 50 | 50 | 100 | --. |
| | TOTAL | | 4 | 28 | 0 | 32 | 18 | | | | | **500** | |

L: Lecture P: Practical T: Tutorial ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External

**Note:** Six hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 34 Hours)

***The course on Research Methodology may be completed by the student in Online mode (Swayam, MOOC's, any other platform approved by AICTE OR on the LMS platform offered by the Institute).**

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B. E. **ELECTRONICS AND TELECOMMUNICATION ENGINEERING**

## Multi -Disciplinary Minors (14 Credits)

| SEM | Course Code | Course Type | Credit | | Course Title |
|---|---|---|---|---|---|
| | | | T | P | |
| Sem III | 3ET205MD | MDM –I | 2 | 0 | Fundamentals of Digital Electronics |
| Sem IV | 4ET214MD | MDM -II | 2 | 0 | Digital ICs and applications |
| Sem V | 5ET227MD | MDM -III | 2 | 0 | Introduction to Microprocessors |
| | 5ET228MD | MDM -IV | 2 | 0 | Microcontroller Applications |
| | 5ET229ML | MDM Lab. -I | 0 | 1 | Microprocessor and Microcontroller Lab |
| Sem VI | 6ET239MD | MDM -V | 2 | 0 | IoT and Applications |
| Sem VII | 7ET307MD | MDM -VI | 2 | 0 | Introduction to Embedded Systems |
| | 7ET308ML | MDM Lab. -II | 0 | 1 | Embedded Systems Lab |
| | | **Total** | **12** | **02** | |

## Program Elective Courses

(Note: Select any one course from the below list of Program Electives)

### Track I: PEC

| SEM | Course Code | Course Type | Credits | Course Title |
|---|---|---|---|---|
| Sem V | 5ET223PE1 | PEC –I | 3 | Power Electronics |
| Sem VI | 6ET234PE1 | PEC –II | 3 | Control Systems |
| Sem VI | 6ET235PE1 | PEC –III | 3 | Computer Architecture |
| Sem VII | 7ET302PE1 | PEC –IV | 3 | MEMS |
| Sem VII | 7ET303PE1 | PEC -V | 3 | Introduction to IOT |
| Sem VII | 7ET304PE1 | PEC -VI | 3 | Biomedical Engineering |

### Track II: PEC

| SEM | Course Code | Course Type | Credits | Course Title |
|---|---|---|---|---|
| Sem V | 5ET223PE2 | PEC –I | 3 | Wireless Sensor Networks |
| Sem VI | 6ET234PE2 | PEC –II | 3 | Introduction to AI |
| Sem VI | 6ET235PE2 | PEC –III | 3 | Introduction to Machine Learning |
| Sem VII | 7ET302PE2 | PEC –IV | 3 | Cloud Computing |
| Sem VII | 7ET303PE2 | PEC -V | 3 | Introduction to 5G – 6G |
| Sem VII | 7ET304PE2 | PEC -VI | 3 | Smart Sensors & Actuators |

### Track III: PEC

| SEM | Course Code | Course Type | Credits | Course Title |
|---|---|---|---|---|
| Sem V | 5ET223PE3 | PEC –I | 3 | Electric Vehicles |
| Sem VI | 6ET234PE3 | PEC –II | 3 | Satellite Communications |
| Sem VI | 6ET235PE3 | PEC –III | 3 | Antenna & Wave Propagation |
| Sem VII | 7ET302PE3 | PEC –IV | 3 | Optic Fiber Communications |
| Sem VII | 7ET303PE3 | PEC -V | 3 | Information Theory & Coding |
| Sem VII | 7ET304PE3 | PEC -VI | 3 | Industrial Automation |

## Open Electives

(Note: Select any one course from the below Tracks of Open Electives)

### Track I: OE

| SEM | Course Code | Course Type | Credit | Course Title |
|---|---|---|---|---|
| Sem III | 3ET206OE1 | OE I | 3 | **Analog Communication** |
| Sem IV | 4ET216OE1 | OE II | 2 | **Optical Fiber Communication** |
| Sem V | 5ET230OE1 | OE III | 2 | **Introduction to Wireless Communication** |
| | | **Total** | **7** | |

### Track II: OE

| SEM | Course Code | Course Type | Credit | Course Title |
|---|---|---|---|---|
| Sem III | 3ET206OE2 | OE I | 3 | **Digital Communication** |
| Sem IV | 4ET216OE2 | OE II | 2 | **Satellite Communication** |
| Sem V | 5ET230OE2 | OE III | 2 | **Introduction to 5G-6G** |
| | | **Total** | **7** | |

**Multi -Disciplinary Double Minors/Honors (ET) (18 Credits) Track I: Mobile and Wireless Communication**

| SEM | Course Code | Credits | Course Title |
|---|---|---|---|
| Sem III | 3ET245DH1 | 4 | **Basic Digital communication and Programming** |
| Sem IV | 4ET246DH1 | 4 | **Data and Wireless Communication** |
| Sem V | 5ET247DH1 | 4 | **Mobile Computing** |
| Sem VI | 6ET248DH1 | 4 | **5G and 6G Communications** |
| Sem VII | 7ET407DH1 | 2 | **Mini Project** |
| | Total | **18** | |

**Multi -Disciplinary Double Minors/Honors (ET) (18 Credits) Track II: IoT and Embedded Systems**

| SEM | Course Code | Credits | Course Title |
|---|---|---|---|
| Sem III | 3ET245DH2 | 4 | **Microcontroller & Embedded C** |
| Sem IV | 4ET246DH2 | 4 | **Sensors and Actuators in Embedded Systems** |
| Sem V | 5ET247DH2 | 4 | **Real Time Embedded Systems** |
| Sem VI | 6ET248DH2 | 4 | **Applications of IoT** |
| Sem VII | 7ET407DH2 | 2 | **Mini Project** |
| | Total | **18** | |

## Nomenclature:

| Courses | |
|---|---|
| **Acronym** | **Course/Subject Vertical** |
| BS | Basic Science Course |
| BL | Basic Science Laboratory |
| ES | Engineering Science Course |
| EL | Engineering Science Laboratory |
| PC | Program Course |
| PL | Program Laboratory |
| PE | Program Elective Course |
| MD | Multidisciplinary Minor Course |
| ML | Multidisciplinary Minor Laboratory |
| OE | Open Elective |

| **Acronym** | **Course/Subject Vertical** |
|---|---|
| VS | Vocational Skill Enhancement Course |
| AE | Ability Enhancement Course |
| EM | Entrepreneurship/Economics/Management Course |
| IK | Indian Knowledge System |
| VE | Value Education Course |
| RM | Research Methodology |
| FP | Field Project |
| II | Industry Internship |
| PR | Project |
| CC | Co-curricular Course |

| | Scheme for Four Year Undergraduate Engineering Degree Programme<br>B.E. in Computer Science and Engineering - Semester - III | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S. N. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total Marks | ESE (Time Hrs.) |
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | Core Courses | | | | | | | | | | | | |
| 1 | Discrete Structure & Graph Theory | 3CS200PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Object Oriented Programming | 3CS201PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Data Structures | 3CS202PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| | Laboratory Courses | | | | | | | | | | | | |
| 4 | Comm. Engag. Project/ Field Project | 3CS400EL | 0 | 4 | 0 | 4 | 2 | | | 25 | 25 | 50 | |
| 5 | Object Oriented Programming | 3CS203PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 6 | Data Structure | 3CS204PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | Multidisciplinary Minor | | | | | | | | | | | | |
| 7 | * Multi-disciplinary Minor#1 (MDM#1) | 3CS205MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2 Hrs. |
| | Open Elective other than a particular Program | | | | | | | | | | | | |
| 8 | Open Elective I | 3CS206OE1/2 | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3 Hrs. |
| | HSSMC (Entrepreneurship/ Economics/ Management Course) | | | | | | | | | | | | |
| 9 | Entrepreneurship Development | 3CS207EM | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2 Hrs. |
| | Value Education Course (VEC) | | | | | | | | | | | | |
| 10 | Environmental Science | 3SH208VE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| DGH Revised on 29.07.2025 | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **700** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **L: Lecture** | **P: Practical** | **T: Tutorial** | **ESE: End Semester Exam** | **IE: Internal Evaluation** | **INT: Internal** | **EXT: External** |

| |
|---|
| **Open Elective I -** 3CS206OE1: Basics of Computing for Engineers \|3CS206OE2: E-Commerce |

* MDM#1 - Please refer the list of Multi-disciplinary Minor courses attached separately at the end (**Annexure I**).
**Note:** Appropriate nos. of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

| | Scheme for Four Year Undergraduate Engineering Degree Programme<br>B.E. in Computer Science and Engineering - Semester - IV | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S. N. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total Marks | ESE (Time Hrs.) |
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Data Communication & Networking | 4CS209PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Operating System | 4CS210PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Theory of Computation | 4CS211PC | 3 | 0 | 0 | 3 | 2 | 40 | 60 | | | 100 | 3 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 4 | Data Communication & Networking | 4CS212PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 5 | Operating System | 4CS213PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 6 | * Multi-disciplinary Minor#2 (MDM#2) | 4CS214MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2 Hrs. |
| | **Vocational and Skill Enhancement Courses** | | | | | | | | | | | | |
| 7 | Computing Skill #1 (VSEC-III) | 4CS215VS | 0 | 2 | 0 | 2 | 2 | | | 50 | - | 50 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 8 | Open Elective II | 4CS216OE1/2 | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| | **HSSMC (Entrepreneurship/ Economics/ Management Course)** | | | | | | | | | | | | |
| 9 | Social Science & Engineering Economics | 4CS217EM | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| | **Ability Enhancement Course (AEC)** | | | | | | | | | | | | |
| 10 | Modern Indian Language | 4SH218AE | 2 | 0 | 0 | 2 | 2 | | | 25 | 25 | 50 | |
| | **Value Education Course (VEC)** | | | | | | | | | | | | |
| 11 | Universal Humans Values & Ethics | 4SH219VE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| DGH Revised on 29.07.2025 | TOTAL | | 19 | 06 | 0 | 25 | **22** | | | | | **700** | |

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|---|---|---|---|---|---|---|
| **L: Lecture** | **P: Practical** | **T: Tutorial** | **ESE: End Semester Exam** | **IE: Internal Evaluation** | **INT: Internal** | **EXT: External** |

**Open Elective II** – 4CS216OE1: Intellectual Property Rights |4CS216OE2: Information Systems for Engineers

* MDM#2 - Please refer the list of Multi-disciplinary Minor courses attached separately at the end (**Annexure I**).

**Note:** Appropriate nos. of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

**Scheme for Multiple Entry and Multiple Exit**

| Exit option -1 (L 5): Award of UG Diploma in Major with 88 credits and an additional 8 credits | | | | |
|---|---|---|---|---|
| **EXIT Courses** | | | | |
| **S.N.** | **Course Code** | **Course Name/Type** | **Mode / Duration** | **Credits** |
| 1 | 5CS243EC | *Network Configuration and Maintenance | Online/offline certification Course | **4** |
| AND | | | | |
| 2 | 5CS244EC | *Full Stack Web Development | | **4** |
| OR | | | | |
| 3 | 5CS405EL | Internship at IT Related Industry | Two Months (288-320 Hrs.) | **8** |

Note: The above exit courses may or may not be offered /available to students during that academic session hence it is the discretion of the department/institute to evaluate the exit course by considering either certification courses or internship from IT related Registered Industry. Students will have a choice to go for (Option 1 AND Option 2) OR (Option 3) for the exit courses.

* Certificate course shall be proposed by BoS after curetting available courses offered by the technological based industries and renowned training-cum- certification providers. These Proposed courses shall meet the skill set requirements which student must acquire. The list of curetted courses may vary as per the requirements of the employment market. These Certificate courses to be evaluated at both level i.e. Internal & External (Evaluation guidelines will be given by concerned authority in the form of SOP)

| | Scheme for Four Year Undergraduate Engineering Degree Programme<br>B.E. in Computer Science and Engineering - Semester - V | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S. N. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total Marks | ESE (Time Hrs.) |
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Database Management Systems | 5CS220PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Compiler Design | 5CS221PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Computer Architecture & Organization | 5CS222PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 4 | Programme Elective Course I | 5CS223PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 5 | Database Management Systems | 5CS224PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 6 | Compiler Design | 5CS225PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Programme Elective Course I | 5CS226PE | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 8 | * Multi-disciplinary Minor#3 (MDM#3) | 5CS227MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| 9 | * Multi-disciplinary Minor#4 (MDM#4) | 5CS228MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| 10 | * Multi-disciplinary Minor#5 (MDM#5) | 5CS229ML | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 11 | Open Elective III | 5CS230OE1/2 | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| DGH Revised on 29.07.2025 | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **750** | |

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| **L: Lecture** | **P: Practical** | **T: Tutorial** | **ESE: End Semester Exam** | **IE: Internal Evaluation** | **INT: Internal** | **EXT: External** |

**Programme Elective Course -I :** Data Science and Statistics | Internet of Things | Introduction to Cyber Security

**Open Elective – III :** 5CS230OE1: Cyber Law & Ethics|5CS230OE2: Introduction to Data Analytics

MDM#3, MDM#4 & MDM#5 - Please refer the list of Multi-disciplinary Minor courses attached separately at the end (**Annexure I**).

**Note:** Appropriate nos. of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

| | Scheme for Four Year Undergraduate Engineering Degree Programme<br>B.E. in Computer Science and Engineering - Semester - VI | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S. N. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total Marks | ESE (Time Hrs.) |
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Security Policy & Governance | 6CS231PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Design & Analysis of Algorithm | 6CS232PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Cloud Computing | 6CS233PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 4 | Program Elective Course II | 6CS234PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 5 | Program Elective Course III | 6CS235PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 6 | Design & Analysis of Algorithm | 6CS236PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Cloud Computing | 6CS237PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 8 | Programme Elective Course II | 6CS238PE | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 9 | * Multi-disciplinary Minor#6 (MDM#6) | 6CS239MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| | **Vocational and Skill Enhancement Courses** | | | | | | | | | | | | |
| 10 | Computing Skill # 2 (VSEC IV ) | 6CS240VS | 1 | 2 | 0 | 3 | 2 | | | 50 | - | 50 | |
| DGH Revised on 29.07.2025 | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **750** | |

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|---|---|---|---|---|---|---|
| **L: Lecture** | **P: Practical** | **T: Tutorial** | **ESE: End Semester Exam** | **IE: Internal Evaluation** | **INT: Internal** | **EXT: External** |

**Programme Elective Course -II :** Natural Language Processing | Big Data Analytics | Cryptography
**Programme Elective Course -III :** Data Warehousing & Mining | Image Processing | Digital Forensics

* MDM#6 - Please refer the list of Multi-disciplinary Minor courses attached separately at the end (**Annexure I**).
**Note:** Appropriate nos. of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

**Scheme for Multiple Entry and Multiple Exit**

| Exit option -3 (L5.5): Award of bachelor's degree in Vocation (B.Voc.) in Major with 132 credits and an additional 8 credits | | | | |
|---|---|---|---|---|
| **EXIT Courses** | | | | |
| **S.N.** | **Course Code** | **Course Name/Type** | **Mode / Duration** | **Credits** |
| 1 | 7CS310EC | *Database Engineer/Database Administrator | Online/offline certification Course | **4** |
| AND | | | | |
| 2 | 7CS311EC | *Cloud Engineer/Cloud Administrator | | **4** |
| OR | | | | |
| 3 | 7CS406EL | Internship at IT Related Industry | Two Months (288-320 Hrs.) | **8** |

Note: The above exit courses may or may not be offered /available to students during that academic session hence it is the discretion of the department/institute to evaluate the exit course by considering either certification courses or internship from IT related Registered Industry. Students will have a choice to go for (Option 1 AND Option 2) OR (Option 3) for the exit courses.

* Certificate course shall be proposed by BoS after curetting available courses offered by the technological based industries and renowned training-cum-certification providers. These Proposed courses shall meet the skill set requirements which student must acquire. The list of curetted courses may vary as per the requirements of the employment market. These Certificate courses to be evaluated at both level i.e. Internal & External (Evaluation guidelines will be given by concerned authority in the form of SOP)

| | Scheme for Four Year Undergraduate Engineering Degree Programme<br>B.E. in Computer Science and Engineering - Semester - VII | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S. N.** | **Course Name** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total Marks** | **ESE (Time Hrs.)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Software Engineering | 7CS300PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Professional Ethics & Management | 7CS301PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Program Elective Course IV | 7CS302PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 4 | Program Elective Course V | 7CS303PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 5 | Program Elective Course VI | 7CS304PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 6 | Programme Elective Course IV | 7CS305PE | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Programme Elective Course V | 7CS306PE | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 8 | * Multi-disciplinary Minor#7 (MDM#7) | 7CS307MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| 9 | * Multi-disciplinary Minor#8 (MDM#8) | 7CS308ML | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Project** | | | | | | | | | | | | |
| 10 | Project | 7CS401PR | 0 | 4 | 0 | 4 | 2 | | | 50 | 50 | 100 | |
| DGH Revised on 29.07.2025 | TOTAL | | 17 | 10 | 0 | 27 | **22** | | | | | **800** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **L: Lecture** | **P: Practical** | **T: Tutorial** | **ESE: End Semester Exam** | **IE: Internal Evaluation** | **INT: Internal** | **EXT: External** |

**Programme Elective Course -IV :** Machine Learning | Virtual & Augmented Reality | Wireless Sensor Networks
**Programme Elective Course -V :** Block chain Fundamentals |Data Storage & Network |Distributed Ledger Technology
**Programme Elective Course -VI :** Optimization Techniques |Cloud System & Infrastructure | Modelling & Simulation

MDM#7 & MDM#8 - Please refer the list of Multi-disciplinary Minor courses attached separately at the end (**Annexure I**).

**Note:** Appropriate nos. of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)



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| | Scheme for Four Year Undergraduate Engineering Degree Programme<br>B.E. in Computer Science and Engineering - Semester - VIII | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S. N. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total Marks | ESE (Time Hrs.) |
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | Core Courses | | | | | | | | | | | | |
| 1 | Research Methodology | 8CS309RM | 4* | 0 | 0 | 4 | 4 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Industry Internship | 8CS402EL | 0 | 24 | 0 | 24 | 12 | | | 100 | 200 | 300 | -- |
| 3 | Project | 8CS403PR | 0 | 4 | 0 | 4 | 2 | | | 50 | 50 | 100 | 3 Hrs. |
| DGH Revised on 29.07.2025 | TOTAL | | 4 | 28 | 0 | 32 | 18 | | | | | **500** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **L: Lecture** | **P: Practical** | **T: Tutorial** | **ESE: End Semester Exam** | **IE: Internal Evaluation** | **INT: Internal** | **EXT: External** |

***The course on Research Methodology may be completed by the student in Online mode (Swayam, MOOC's, any other platform approved by AICTE or on the LMS platform offered by the Institute).**

**Note:** Appropriate nos. of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

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**Note:**

1. The Multi-Disciplinary Minors (MDMs) offered by the Computer Science and Engineering discipline are open to students from all engineering disciplines **except** the: i. Computer Science and Engineering, ii. Computer Engineering, iii. Artificial Intelligence and Data Science iv. Artificial Intelligence (AI) and Data Science, v. Computer Science and Engineering (IoT), vi. Computer Science and Engineering (Artificial Intelligence and Machine Learning), vii. Computer Science and Information Technology, viii. Computer Science and Engineering (Data Science), ix. Information Technology and allied disciplines. (**Annexure I**: MDM Basket offered by CSE)
2. Students enrolled in : i. Computer Science and Engineering, ii. Computer Engineering, iii. Artificial Intelligence and Data Science iv. Artificial Intelligence (AI) and Data Science, v. Computer Science and Engineering (IoT), vi. Computer Science and Engineering (Artificial Intelligence and Machine Learning), vii. Computer Science and Information Technology, viii. Computer Science and Engineering (Data Science), ix. Information Technology and allied disciplines. are eligible to opt for MDMs offered by all other engineering disciplines. (**Refer the scheme of respective disciplines**)
3. The Baskets of Multi-Disciplinary Double Minors offered by Computer Science and Engineering discipline are listed under **Annexure II.**
4. Detailed guidelines for **Honors with Research** option is listed under **Annexure III.**
5. To promote the adoption and use of Open-Source Software (OSS), a subject-wise suggestive list of OSS tools is provided as part of this scheme. These tools can be effectively utilized for conducting practical sessions and demonstrations. Please note that this list is dynamic and may evolve with advancements in technology and the introduction of new tools or versions. **(Annexure IV:** List of suggested OSS**)**

## Annexure I

### Multidisciplinary Minors Subjects offered by Computer Science and Engineering

| Reference | Sem | Subject Code | Subject Title | Type | Credits |
|---|---|---|---|---|---|
| MDM#1 | III | 3CS205MD / 3KE205MD / 3DS205MD / 3AD205MD | Foundations of Computing & Programming | Theory | 2 |
| MDM#2 | IV | 4CS214MD | Data Structures and Problem Solving | Theory | 2 |
| MDM#3 | V | 5CS227MD | Database Management Systems | Theory | 2 |
| MDM#4 | V | 5CS228MD | Web Technologies & Development | Theory | 2 |
| MDM#5 | V | 5CS229ML | Web Technologies Lab | Practical | 1 |
| MDM#6 | VI | 6CS239MD | Cloud Computing & Virtualization | Theory | 2 |
| MDM#7 | VII | 7CS307MD | Computational Thinking & Algorithmic Problem Solving | Theory | 2 |
| MDM#8 | VII | 7CS308ML | Interdisciplinary Computing Project Lab | Practical | 1 |

**Note:** Above is the list of Multi-Disciplinary Minors (MDMs) offered by Computer Science and Engineering discipline. These minors are open to students from all engineering disciplines except the following: i. Computer Science and Engineering, ii. Computer Engineering, iii. Artificial Intelligence and Data Science iv. Artificial Intelligence (AI) and Data Science, v. Computer Science and Engineering (IoT), vi. Computer Science and Engineering (Artificial Intelligence and Machine Learning), vii. Computer Science and Information Technology, viii. Computer Science and Engineering (Data Science), ix. Information Technology and allied disciplines.

## Annexure II

## Multidisciplinary Double Minors Subjects offered by Computer Science and Engineering

| Track: Cyber Security (Honours / Double Minor) | | | | |
|---|---|---|---|---|
| **Semester** | **Subject Code** | **Subject Title** | **Credits** | **T/P** |
| III | 3CS245DH1 | Fundamentals of Cyber Security | 4 | Theory |
| IV | 4CS246DH1 | Network & Web Application Security | 4 | Theory |
| V | 5CS247DH1 | Digital Forensics & Incident Response | 4 | Theory |
| VI | 6CS248DH1 | Advanced Topics in Cryptography | 4 | Theory |
| VII | 7CS407DH1 | Cyber Security Practice Lab | 2 | Lab |

| Track: Data Science (Honours / Double Minor) | | | | |
|---|---|---|---|---|
| Semester | **Subject Code** | Subject Title | Credits | T/P |
| III | 3CS245DH2 | Introduction to Data Science | 4 | Theory |
| IV | 4CS246DH2 | Statistical Methods for Data Analysis | 4 | Theory |
| V | 5CS247DH2 | Machine Learning Techniques | 4 | Theory |
| VI | 6CS248DH2 | Big Data Systems & Tools | 4 | Theory |
| VII | 7CS407DH2 | Data Science Lab with Python & R | 2 | Lab |

**Note:** The subjects offered by Computer Science and Engineering discipline as Double Minor for students of other major disciplines, shall also be applicable and treated as Honours subjects for students pursuing a major in Computer Science and Engineering.

## Annexure III

## Honors with Research

| Semester | **Subject Code** | Subject Title | Credits | T/P |
|---|---|---|---|---|
| VII | 7CS408HR | Research Project (Part#1)<br>Problem Identification & Definition<br>Literature Review<br>Experimental Work | 9 | P |
| VIII | 8CS409HR | Research Project (Part#2)<br>Prototype Development<br>Data Analysis<br>Publication(s) | 9 | P |

**Note:** Students intending to pursue a degree with Honours with Research must undertake and successfully complete a dedicated research project during Semesters VII and VIII, as outlined in the curriculum and in accordance with the guidelines issued by the respective department from time to time. This research project shall be distinct and independent from the regular final year project (7CS401PR & 8CS403PR).

Annexure IV

## Suggestive Subject-Wise list Open-Source Tools

| Name of Subject | Open-Source Tools | Name of Subject | Open-Source Tools |
|---|---|---|---|
| **Object-Oriented Programming** | Eclipse, NetBeans, IntelliJ IDEA (Community Edition), BlueJ | **Sensors & Actuators** | Arduino IDE, Raspberry Pi OS |
| **Data Structure** | Code::Blocks, Visual Studio Code, GDB Debugger | **Cryptography** | OpenSSL, GPG |
| **Data Communication & Networking** | Wireshark, Mininet, Cisco Packet Tracer (free educational license), NS-3 | **Computer Architecture & Organization** | Gem5, Logisim |
| **Operating System** | QEMU, VirtualBox, Unix/Linux Shell, FreeDOS | **Information Retrieval** | Apache Solr, Elasticsearch |
| **Artificial Intelligence** | TensorFlow, PyTorch, OpenCV, Scikit-learn | **Supervised Machine Learning** | TensorFlow, Scikit-learn |
| **Programming Methodology using Python** | Jupyter Notebook, Anaconda, PyCharm (Community Edition), VS Code | **Digital Forensics** | Autopsy, Sleuth Kit, Volatility |
| **Probability & Statistics for Data Science** | R, RStudio, NumPy, SciPy, Matplotlib | **Internet of Everything** | Node-RED, ThingsBoard, Kaa IoT |
| **Cognitive Technologies** | IBM Watson (free tier), TensorFlow, spaCy | **Image & Video Processing** | OpenCV, GIMP, FFmpeg |
| **Data Science and Statistics** | R, Jupyter Notebook, KNIME | **Augmented & Virtual Reality** | Blender, Godot Engine |
| **Internet of Things** | Arduino IDE, Node-RED, ThingsBoard | **Usability Engineering** | Axure RP (free for students), Figma |
| **Introduction to Cyber Security** | Kali Linux, Metasploit Framework, OpenVAS | **Cryptography & Security** | Wireshark, OpenSSL, VeraCrypt |
| **Database Management Systems** | MySQL, PostgreSQL, SQLite, MongoDB | **Wireless Sensor Networks** | Cooja, NS-3 |
| **Compiler Design** | LLVM, GCC, Flex, Bison | **System & Software Security** | Metasploit, Snort |
| **Numerical Methods** | Octave, SciPy, NumPy | **Blockchain Fundamentals** | Ethereum, Hyperledger, Ganache |
| **Microprocessor & Assembly Language Programming** | Keil uVision, GNUSim8085, Logisim | **Data Storage & Network** | FreeNAS, OpenFiler |
| **Design & Analysis of Algorithm** | Gephi, NetworkX | **Distributed Ledger Technology** | Hyperledger Fabric, Corda |
| **Cloud Computing** | OpenStack, CloudStack, Apache Hadoop | **Deep Learning** | Keras, TensorFlow, PyTorch |
| **Natural Language Processing** | NLTK, spaCy, Hugging Face Transformers | **Data Visualization** | Tableau Public, Matplotlib, D3.js |
| **Big Data Analytics** | Apache Hadoop, Apache Spark, Dask | **Data Warehousing** | Apache Hive, Pentaho |

| | Scheme for Four Year Undergraduate Engineering Degree Programme B.E. in Computer Science and Engineering (Data Science) - Semester - III | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S. N. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total Marks | ESE (Time Hrs.) |
| | | | | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | Core Courses | | | | | | | | | | | | |
| 1 | Discrete Structure & Graph Theory | 3DS200PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Programming Methodology using Python | 3DS201PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Data Structures | 3DS202PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| | Laboratory Courses | | | | | | | | | | | | |
| 4 | Comm. Engag. Project/ Field Project | 3DS400EL | 0 | 4 | 0 | 4 | 2 | | | 25 | 25 | 50 | |
| 5 | Programming Methodology using Python | 3DS203PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 6 | Data Structure | 3DS204PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | Multidisciplinary Minor | | | | | | | | | | | | |
| 7 | * Multi-disciplinary Minor#1 (MDM#1) | 3DS205MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2 Hrs. |
| | Open Elective other than a particular Program | | | | | | | | | | | | |
| 8 | Open Elective I | 3DS206OE1/2 | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3 Hrs. |
| | HSSMC (Entrepreneurship/ Economics/ Management Course) | | | | | | | | | | | | |
| 9 | Entrepreneurship Development | 3DS207EM | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2 Hrs. |
| | Value Education Course (VEC) | | | | | | | | | | | | |
| 10 | Environmental Science | 3SH208VE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| DGH Revised on 29.07.2025 | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **700** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **L: Lecture** | **P: Practical** | **T: Tutorial** | **ESE: End Semester Exam** | **IE: Internal Evaluation** | **INT: Internal** | **EXT: External** |

**Open Elective I -** 3DS206OE1: Basics of Computing for Engineers|3DS206OE2: E-Commerce

* MDM#1 - Please refer the list of Multi-disciplinary Minor courses attached separately at the end (**Annexure#1**).
**Note:** Appropriate nos. of hour per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

| | Scheme for Four Year Undergraduate Engineering Degree Programme B.E. in Computer Science and Engineering (Data Science) - Semester - IV | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S. N. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total Marks | ESE (Time Hrs.) |
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | Core Courses | | | | | | | | | | | | |
| 1 | Data Communication & Networking | 4DS209PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Operating System | 4DS210PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Probability & Statistics for Data Science | 4DS211PC | 3 | 0 | 0 | 3 | 2 | 40 | 60 | | | 100 | 3 Hrs. |
| | Laboratory Courses | | | | | | | | | | | | |
| 4 | Data Communication & Networking | 4DS212PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 5 | Operating System | 4DS213PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | Multidisciplinary Minor | | | | | | | | | | | | |
| 6 | * Multi-disciplinary Minor#2 (MDM#2) | 4DS214MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2 Hrs. |
| | Vocational and Skill Enhancement Courses | | | | | | | | | | | | |
| 7 | Computing Skill #1 (VSEC III) | 4DS215VS | 0 | 2 | 0 | 2 | 2 | | | 50 | - | 50 | |
| | Open Elective other than a particular Program | | | | | | | | | | | | |
| 8 | Open Elective II | DS216OE1/2 | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| | HSSMC (Entrepreneurship/ Economics/ Management Course) | | | | | | | | | | | | |
| 9 | Social Science & Engineering Economics | 4DS217EM | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2Hrs. |
| | (Ability Enhancement Course (AEC) | | | | | | | | | | | | |
| 10 | Modern Indian Language | 4SH218AE | 2 | 0 | 0 | 2 | 2 | | | 25 | 25 | 50 | |
| | Value Education Course (VEC) | | | | | | | | | | | | |
| 11 | Universal Humans Values & Ethics | 4SH219VE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| DGH Revised on 29.07.2025 | TOTAL | | 19 | 06 | 0 | 25 | **22** | | | | | **700** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **L: Lecture** | **P: Practical** | **T: Tutorial** | **ESE: End Semester Exam** | **IE: Internal Evaluation** | **INT: Internal** | **EXT: External** |

**Open Elective II** – DS216OE1: Intellectual Property Rights| DS216OE2: Information Systems for Engineers

* MDM#2 - Please refer the list of Multi-disciplinary Minor courses attached separately at the end (**Annexure#1**).
**Note:** Appropriate nos. of hour per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

**Scheme for Multiple Entry and Multiple Exit**

| Exit option -1 (L 5): Award of UG Diploma in Major with 88 credits and an additional 8 credits | | | | |
|---|---|---|---|---|
| **EXIT Courses** | | | | |
| **S.N.** | **Course Code** | **Course Name/Type** | **Mode / Duration** | **Credits** |
| 1 | 5DS243EC | *Network Configuration and Maintenance | Online/offline certification Course | **4** |
| AND | | | | |
| 2 | 5DS244EC | *Full Stack Web Development | | **4** |
| OR | | | | |
| 3 | 5DS405EL | Internship at IT Related Industry | Two Months (288-320 Hrs.) | **8** |

Note: The above exit courses may or may not be offered /available to students during that academic session hence it is the discretion of the department/institute to evaluate the exit course by considering either certification courses or internship from IT related Registered Industry. Students will have a choice to go for (Option 1 AND Option 2) OR (Option 3) for the exit courses.

* Certificate course shall be proposed by BoS after curetting available courses offered by the technological based industries and renowned training-cum-certification providers. These Proposed courses shall meet the skill set requirements which student must acquire. The list of curetted courses may vary as per the requirements of the employment market. These Certificate courses to be evaluated at both level i.e. Internal & External (Evaluation guidelines will be given by concerned authority in the form of SOP)

## Scheme for Four Year Undergraduate Engineering Degree Programme B.E. in Computer Science and Engineering (Data Science) - Semester - V

| S. N. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total Marks | ESE (Time Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Database Management Systems | 5DS220PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Compiler Design | 5DS221PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Computer Architecture & Organization | 5DS222PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 4 | Programme Elective Course I | 5DS223PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 5 | Database Management Systems | 5DS224PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 6 | Compiler Design | 5DS225PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Programme Elective Course I | 5DS226PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 8 | * Multi-disciplinary Minor#3 (MDM#3) | 5DS227MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| 9 | * Multi-disciplinary Minor#4 (MDM#4) | 5DS228MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| 10 | * Multi-disciplinary Minor#5 (MDM#5) | 5DS229ML | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 11 | Open Elective III | 5DS230OE1/2 | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| DGH Revised on 29.07.2025 | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **750** | |

| L: Lecture | P: Practical | T: Tutorial | ESE: End Semester Exam | IE: Internal Evaluation | INT: Internal | EXT: External |
|---|---|---|---|---|---|---|

**Programme Elective Course -I :**Data Science and Statistics| Cognitive Technologies
**Open Elective – III :**5DS230OE1: Cyber Law & Ethics|5DS230OE2: Introduction to Data Analytics

MDM#3, MDM#4 & MDM#5 - Please refer the list of Multi-disciplinary Minor courses attached separately at the end (**Annexure#1**).
**Note:** Appropriate nos. of hour per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

| | Scheme for Four Year Undergraduate Engineering Degree Programme B.E. in Computer Science and Engineering (Data Science) - Semester - VI | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S. N. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total Marks | ESE (Time Hrs.) |
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | Core Courses | | | | | | | | | | | | |
| 1 | Security Policy & Governance | 6DS231PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Design & Analysis of Algorithm | 6DS232PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Cloud Computing | 6DS233PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 4 | Program Elective Course II | 6DS234PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 5 | Program Elective Course III | 6DS235PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| | Laboratory Courses | | | | | | | | | | | | |
| 6 | Design & Analysis of Algorithm | 6DS236PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Cloud Computing | 6DS237PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 8 | Programme Elective Course II | 6DS238PE | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | Multidisciplinary Minor | | | | | | | | | | | | |
| 9 | * Multi-disciplinary Minor#6 (MDM#6) | 6DS239MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| | Vocational and Skill Enhancement Courses | | | | | | | | | | | | |
| 10 | Computing Skill # 2 (VSEC IV) | 6DS240VS | 1 | 2 | 0 | 3 | 2 | | | 50 | - | 50 | |
| DGH Revised on 29.07.2025 | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **750** | |

| L: Lecture | P: Practical | T: Tutorial | ESE: End Semester Exam | IE: Internal Evaluation | INT: Internal | EXT: External |
|---|---|---|---|---|---|---|

**Programme Elective Course -II :** Natural Language Processing | Big Data Analytics

**Programme Elective Course -III :** Machine Learning | Wireless Sensor Network

MDM#6 - Please refer the list of Multi-disciplinary Minor courses attached separately at the end (**Annexure#1**).

**Note:** Appropriate nos. of hour per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

**Scheme for Multiple Entry and Multiple Exit**

| **Exit option -3 (L5.5): Award of bachelor's degree in Vocation (B.Voc.) in Major with 132 credits and an additional 8 credits** | | | | |
|---|---|---|---|---|
| **EXIT Courses** | | | | |
| **S.N.** | **Course Code** | **Course Name/Type** | **Mode / Duration** | **Credits** |
| 1 | 7DS310EC | *Database Engineer/Database Administrator | Online/offline certification Course | **4** |
| AND | | | | |
| 2 | 7DS311EC | *Cloud Engineer/Cloud Administrator | | **4** |
| OR | | | | |
| 3 | 7DS406EL | Internship at IT Related Industry | Two Months (288-320 Hrs.) | **8** |

Note: The above exit courses may or may not be offered /available to students during that academic session hence it is the discretion of the department/institute to evaluate the exit course by considering either certification courses or internship from IT related Registered Industry. Students will have a choice to go for (Option 1 AND Option 2) OR (Option 3) for the exit courses.

* Certificate course shall be proposed by BoS after curetting available courses offered by the technological based industries and renowned training-cum-certification providers. These Proposed courses shall meet the skill set requirements which student must acquire. The list of curetted courses may vary as per the requirements of the employment market. These Certificate courses to be evaluated at both level i.e. Internal & External (Evaluation guidelines will be given by concerned authority in the form of SOP)

| | Scheme for Four Year Undergraduate Engineering Degree Programme B.E. in Computer Science and Engineering (Data Science) - Semester - VII | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S. N.** | **Course Name** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total Marks** | **ESE (Time Hrs)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Software Engineering | 7DS300PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Professional Ethics & Management | 7DS301PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Program Elective Course IV | 7DS302PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 4 | Program Elective Course V | 7DS303PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 5 | Program Elective Course VI | 7DS304PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 6 | Programme Elective Course IV | 7DS305PE | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Programme Elective Course V | 7DS306PE | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 8 | * Multi-disciplinary Minor#7 (MDM#7) | 7DS307MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2Hrs. |
| 9 | * Multi-disciplinary Minor#8 (MDM#8) | 7DS308ML | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Project** | | | | | | | | | | | | |
| 10 | Project | 7DS401PR | 0 | 4 | 0 | 4 | 2 | | | 50 | 50 | 100 | 3 Hrs. |
| DGH Revised on 29.07.2025 | TOTAL | | 17 | 10 | 0 | 27 | **22** | | | | | **800** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **L: Lecture** | **P: Practical** | **T: Tutorial** | **ESE: End Semester Exam** | **IE: Internal Evaluation** | **INT: Internal** | **EXT: External** |

**Programme Elective Course -IV:** Deep Learning | Digital Forensics
**Programme Elective Course -V:** Data Visualization | Data Warehousing
**Programme Elective Course -VI:** Block chain Fundamentals | Optimization Techniques

* MDM#7 & MDM#8 - Please refer the list of Multi-disciplinary Minor courses attached separately at the end (**Annexure#1**).

**Note:** Appropriate nos. of hour per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

| | Scheme for Four Year Undergraduate Engineering Degree Programme B.E. in Computer Science and Engineering (Data Science) - Semester - VIII | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S. N.** | **Course Name** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total Marks** | **ESE (Time Hrs)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Research Methodology | 8DS309RM | 4* | 0 | 0 | 4 | 4 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Industry Internship | 8DS402EL | 0 | 24 | 0 | 24 | 12 | | | 100 | 200 | 300 | |
| 3 | Project | 8DS403PR | 0 | 4 | 0 | 4 | 2 | | | 50 | 50 | 100 | 3 Hrs |
| DGH Revised on 29.07.2025 | TOTAL | | 4 | 28 | 0 | 32 | 18 | | | | | **500** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **L: Lecture** | **P: Practical** | **T: Tutorial** | **ESE: End Semester Exam** | **IE: Internal Evaluation** | **INT: Internal** | **EXT: External** |

***The course on Research Methodology may be completed by the student in Online mode (Swayam, MOOC's, any other platform approved by AICTE or on the LMS platform offered by the Institute).**

**Note:** Appropriate nos. of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

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**Note:**

1. The Multi-Disciplinary Minors (MDMs) offered by the Computer Science and Engineering (Data Science) discipline are open to students from all engineering disciplines **except** the: i. Computer Science and Engineering, ii. Computer Engineering, iii. Artificial Intelligence and Data Science iv. Artificial Intelligence (AI) and Data Science, v. Computer Science and Engineering (IoT), vi. Computer Science and Engineering (Artificial Intelligence and Machine Learning), vii. Computer Science and Information Technology, viii. Computer Science and Engineering (Data Science), ix. Information Technology and allied disciplines. (**Annexure I**: MDM Basket offered by CSE)
2. Students enrolled in : i. Computer Science and Engineering, ii. Computer Engineering, iii. Artificial Intelligence and Data Science iv. Artificial Intelligence (AI) and Data Science, v. Computer Science and Engineering (IoT), vi. Computer Science and Engineering (Artificial Intelligence and Machine Learning), vii. Computer Science and Information Technology, viii. Computer Science and Engineering (Data Science), ix. Information Technology and allied disciplines. are eligible to opt for MDMs offered by all other engineering disciplines. (**Refer the scheme of respective discipline**)
3. The Baskets of Multi-Disciplinary Double Minors offered by Computer Science and Engineering (Data Science) discipline are listed under **Annexure II.**
4. Detailed guidelines for **Honors with Research** option is listed under **Annexure III.**
5. To promote the adoption and use of Open-Source Software (OSS), a subject-wise suggestive list of OSS tools is provided as part of this scheme. These tools can be effectively
6. utilized for conducting practical sessions and demonstrations. Please note that this list is dynamic and may evolve with advancements in technology and the introduction of new tools or versions. **(Annexure IV:** List of suggested OSS**)**

## Annexure I

### Multidisciplinary Minors Subjects offered by Computer Science and Engineering (Data Science)

| Reference | Sem | Subject Code | Subject Title | Type | Credits |
|---|---|---|---|---|---|
| MDM#1 | III | 3DS205MD / 3CS205MD / 3KE205MD / 3AD205MD | Foundations of Computing & Programming | Theory | 2 |
| MDM#2 | IV | 4DS214MD | Foundations of Data Science & Statistics | Theory | 2 |
| MDM#3 | V | 5DS227MD | Data Wrangling & Preprocessing Techniques | Theory | 2 |
| MDM#4 | V | 5DS228MD | Data Visualization Techniques | Theory | 2 |
| MDM#5 | V | 5DS229ML | Data Analytics Lab | Practical | 1 |
| MDM#6 | VI | 6DS239MD | Applied Machine Learning for Engineers | Theory | 2 |
| MDM#7 | VII | 7DS307MD | Predictive Analytics & Decision Support | Theory | 2 |
| MDM#8 | VII | 7DS308ML | Data Science Project Lab | Practical | 1 |

**Note:** Above is the list of Multi-Disciplinary Minors (MDMs) offered by Computer Science and Engineering (Data Science) discipline. These minors are open to students from all engineering disciplines except the following: i. Computer Science and Engineering, ii. Computer Engineering, iii. Artificial Intelligence and Data Science iv. Artificial Intelligence (AI) and Data Science, v. Computer Science and Engineering (IoT), vi. Computer Science and Engineering (Artificial Intelligence and Machine Learning), vii. Computer Science and Information Technology, viii. Computer Science and Engineering (Data Science), ix. Information Technology and allied disciplines.

## Annexure II

## Multidisciplinary Double Minors Subjects offered by Computer Science and Engineering (Data Science)

| Track: Artificial Intelligence (AI) (Honours / Double Minor) | | | | |
|---|---|---|---|---|
| Semester | **Subject Code** | Subject Title | Credits | T/P |
| III | 3DS245DH1 | Fundamentals of Artificial Intelligence | 4 | Theory |
| IV | 4DS246DH1 | Intelligent Systems and Applications | 4 | Theory |
| V | 5DS247DH1 | Neural Networks and Cognitive Computing | 4 | Theory |
| VI | 6DS248DH1 | Ethical and Explainable AI | 4 | Theory |
| VII | 7DS407DH1 | AI Implementation Lab (Using TensorFlow/PyTorch) | 2 | Lab |

| Track: Data Science (Honours / Double Minor) | | | | |
|---|---|---|---|---|
| Semester | **Subject Code** | Subject Title | Credits | T/P |
| III | 3DS245DH2 | Data Science Foundations and Tools | 4 | Theory |
| IV | 4DS246DH2 | Statistical Data Modelling and Inference | 4 | Theory |
| V | 5DS247DH2 | Machine Learning and Applications | 4 | Theory |
| VI | 6DS248DH2 | Scalable Data Systems and Analytics | 4 | Theory |
| VII | 7DS407DH2 | Applied Data Science Lab (Spark/NoSQL/MLFlow) | 2 | Lab |

**Note:** The subjects offered by Computer Science and Engineering (Data Science) discipline as Double Minor for students of other major disciplines, shall also be applicable and treated as Honours subjects for students pursuing a major in Computer Science and Engineering (Data Science).

## Annexure III

## Honors with Research

| Semester | **Subject Code** | Subject Title | Credits | T/P |
|---|---|---|---|---|
| VII | 7DS408HR | Research Project (Part#1)<br>Problem Identification & Definition<br>Literature Review<br>Experimental Work | 9 | P |
| VIII | 8DS409HR | Research Project (Part#2)<br>Prototype Development<br>Data Analysis<br>Publication(s) | 9 | P |

**Note:** Students intending to pursue a degree with Honours with Research must undertake and successfully complete a dedicated research project during Semesters VII and VIII, as outlined in the curriculum and in accordance with the guidelines issued by the respective department from time to time. This research project shall be distinct and independent from the regular final year project (7DS401PR & 8DS403PR).

## Annexure IV

### Suggestive Subject-Wise list Open-Source Tools

| Name of Subject | Open-Source Tools | Name of Subject | Open-Source Tools |
|---|---|---|---|
| **Object-Oriented Programming** | Eclipse, NetBeans, IntelliJ IDEA (Community Edition), BlueJ | **Sensors & Actuators** | Arduino IDE, Raspberry Pi OS |
| **Data Structure** | Code::Blocks, Visual Studio Code, GDB Debugger | **Cryptography** | OpenSSL, GPG |
| **Data Communication & Networking** | Wireshark, Mininet, Cisco Packet Tracer (free educational license), NS-3 | **Computer Architecture & Organization** | Gem5, Logisim |
| **Operating System** | QEMU, VirtualBox, Unix/Linux Shell, FreeDOS | **Information Retrieval** | Apache Solr, Elasticsearch |
| **Artificial Intelligence** | TensorFlow, PyTorch, OpenCV, Scikit-learn | **Supervised Machine Learning** | TensorFlow, Scikit-learn |
| **Programming Methodology using Python** | Jupyter Notebook, Anaconda, PyCharm (Community Edition), VS Code | **Digital Forensics** | Autopsy, Sleuth Kit, Volatility |
| **Probability & Statistics for Data Science** | R, RStudio, NumPy, SciPy, Matplotlib | **Internet of Everything** | Node-RED, ThingsBoard, Kaa IoT |
| **Cognitive Technologies** | IBM Watson (free tier), TensorFlow, spaCy | **Image & Video Processing** | OpenCV, GIMP, FFmpeg |
| **Data Science and Statistics** | R, Jupyter Notebook, KNIME | **Augmented & Virtual Reality** | Blender, Godot Engine |
| **Internet of Things** | Arduino IDE, Node-RED, ThingsBoard | **Usability Engineering** | Axure RP (free for students), Figma |
| **Introduction to Cyber Security** | Kali Linux, Metasploit Framework, OpenVAS | **Cryptography & Security** | Wireshark, OpenSSL, VeraCrypt |
| **Database Management Systems** | MySQL, PostgreSQL, SQLite, MongoDB | **Wireless Sensor Networks** | Cooja, NS-3 |
| **Compiler Design** | LLVM, GCC, Flex, Bison | **System & Software Security** | Metasploit, Snort |
| **Numerical Methods** | Octave, SciPy, NumPy | **Blockchain Fundamentals** | Ethereum, Hyperledger, Ganache |
| **Microprocessor & Assembly Language Programming** | Keil uVision, GNUSim8085, Logisim | **Data Storage & Network** | FreeNAS, OpenFiler |
| **Design & Analysis of Algorithm** | Gephi, NetworkX | **Distributed Ledger Technology** | Hyperledger Fabric, Corda |
| **Cloud Computing** | OpenStack, CloudStack, Apache Hadoop | **Deep Learning** | Keras, TensorFlow, PyTorch |
| **Natural Language Processing** | NLTK, spaCy, Hugging Face Transformers | **Data Visualization** | Tableau Public, Matplotlib, D3.js |
| **Big Data Analytics** | Apache Hadoop, Apache Spark, Dask | **Data Warehousing** | Apache Hive, Pentaho |

| | Scheme for Four Year Undergraduate Engineering Degree Programme<br>B.E. in Artificial Intelligence and Data Science - Semester- III | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S.N.** | **Course Name** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total Marks** | **ESE (Time Hrs.)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Discrete Structure & Graph Theory | 3AD200PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| 2 | Object Oriented Programming | 3AD201PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| 3 | Data Structures | 3AD202PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 4 | Comm. Engg. Project / Field Project | 3AD400EL | 0 | 4 | 0 | 4 | 2 | | | 25 | 25 | 50 | |
| 5 | Object Oriented Programming | 3AD203PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 6 | Data Structure | 3AD204PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 7 | * Multi-disciplinary Minor#1 (MDM#1) | 3AD205MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2Hrs. |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 8 | Open Elective-I | 3AD206OE1/2 | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3Hrs. |
| | **HSSMC (Entrepreneurship/Economics/Management Course)** | | | | | | | | | | | | |
| 9 | Entrepreneurship Development | 3AD207EM | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2Hrs. |
| | **Value Education Course (VEC)** | | | | | | | | | | | | |
| 10 | Environmental Science | 3SH208VE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2Hrs. |
| DGH Revised on 29.07.2025 | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **700** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **L: Lecture** | **P: Practical** | **T: Tutorial** | **ESE: End Semester Exam** | **IE: Internal Evaluation** | **INT: Internal** | **EXT: External** |

**Open Elective I -** 3AD206OE1: Basics of Computing for Engineers | 3AD206OE2: E-Commerce

* MDM#1 - Please refer the list of Multi-disciplinary Minor courses attached separately at the end (**Annexure I**).
**Note:** Appropriate nos. of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

| | Scheme for Four Year Undergraduate Engineering Degree Programme<br>B.E. in Artificial Intelligence and Data Science - Semester- IV | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S.N. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total Marks | ESE (Time Hrs.) |
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Data Communication & Networking | 4AD209PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| 2 | Operating System | 4AD210PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| 3 | Probability & Statistics for Data Science | 4AD211PC | 3 | 0 | 0 | 3 | 2 | 40 | 60 | | | 100 | 3Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 4 | Data Communication & Networking | 4AD212PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | 3Hrs. |
| 5 | Operating System | 4AD213PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | 3Hrs. |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 6 | * Multi-disciplinary Minor#2 (MDM#2) | 4AD214MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2Hrs. |
| | **Vocational and Skill Enhancement Courses** | | | | | | | | | | | | |
| 7 | Computing Skill #1 (VSEC-III) | 4AD215VS | 0 | 2 | 0 | 2 | 2 | | | 50 | - | 50 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 8 | Open Elective II | 4AD216OE1/2 | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2Hrs. |
| | **HSSMC (Entrepreneurship/Economics/Management Course)** | | | | | | | | | | | | |
| 9 | Social Science & Engineering Economics | 4AD217EM | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2Hrs. |
| | **(Ability Enhancement Course(AEC)** | | | | | | | | | | | | |
| 10 | Modern Indian Language | 4SH218AE | 2 | 0 | 0 | 2 | 2 | | | 25 | 25 | 50 | . |
| | **Value Education Course(VEC)** | | | | | | | | | | | | |
| 11 | Universal Humans Values (UHV) | 4SH219VE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2Hrs. |
| DGH Revised on 29.07.2025 | TOTAL | | 19 | 06 | 0 | 25 | **22** | | | | | **700** | |

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|---|---|---|---|---|---|---|
| **L:Lecture** | **P:Practical** | **T:Tutorial** | **ESE: End Semester Exam** | **IE: Internal Evaluation** | **INT: Internal** | **EXT: External** |

**Open Elective II** – 4AD216OE1: Intellectual Property Rights | 4AD216OE2: Information Systems for Engineers

* MDM#2 - Please refer the list of Multi-disciplinary Minor courses attached separately at the end (**Annexure I**).

**Note:** Appropriate nos. of hour per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

**Scheme for Multiple Entry and Multiple Exit**

| Exit option -1 (L 5): Award of UG Diploma in Major with 88 credits and an additional 8 credits | | | | |
|---|---|---|---|---|
| **EXIT Courses** | | | | |
| **S.N.** | **Course Code** | **Course Name/Type** | **Mode / Duration** | **Credits** |
| 1 | 5AD243EC | *Network Configuration and Maintenance | Online/offline certification Course | **4** |
| AND | | | | |
| 2 | 5AD244EC | *Full Stack Web Development | | **4** |
| OR | | | | |
| 3 | 5AD405EL | Internship at IT Related Industry | Two Months (288-320 Hrs.) | **8** |

Note: The above exit courses may or may not be offered /available to students during that academic session hence it is the discretion of the department/institute to evaluate the exit course by considering either certification courses or internship from IT related Registered Industry. Students will have a choice to go for (Option 1 AND Option 2) OR (Option 3) for the exit courses.

* Certificate course shall be proposed by BoS after curetting available courses offered by the technological based industries and renowned training-cum-certification providers. These Proposed courses shall meet the skill set requirements which student must acquire. The list of curetted courses may vary as per the requirements of the employment market. These Certificate courses to be evaluated at both level i.e. Internal & External (Evaluation guidelines will be given by concerned authority in the form of SOP)

| | Scheme for Four Year Undergraduate Engineering Degree Programme<br>B.E. in Artificial Intelligence and Data Science - Semester- V | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S.N. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total Marks | ESE (Time Hrs.) |
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Database Management Systems | 5AD220PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| 2 | Machine Learning Techniques | 5AD221PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| 3 | Data Science | 5AD222PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| 4 | Programme Elective Course I | 5AD223PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 5 | Database Management Systems | 5AD224PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | 3Hrs. |
| 6 | Compiler Design | 5AD225PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | 3Hrs. |
| 7 | Programme Elective Course I | 5AD226PE | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | 3Hrs. |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 8 | * Multi-disciplinary Minor#4 (MDM#4) | 5AD227MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2Hrs. |
| 9 | * Multi-disciplinary Minor#5 (MDM#5) | 5AD228MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2Hrs. |
| 10 | * Multi-disciplinary Minor#6 (MDM#6) | 5AD229ML | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | 3Hrs. |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 11 | Open Elective III | 5AD230OE1/2 | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2Hrs. |
| DGH Revised on 29.07.2025 | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **750** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **L:Lecture** | **P:Practical** | **T:Tutorial** | **ESE: End Semester Exam** | **IE: Internal Evaluation** | **INT: Internal** | **EXT: External** |

**Programme Elective Course-I :** Business Intelligence | Introduction to Cyber Security

**Open Elective – III :** 5AD230OE1: Cyber Law & Ethics | 5AD230OE2: Introduction to Data Analytics

* MDM#3, MDM#4 & MDM#5 - Please refer the list of Multi-disciplinary Minor courses attached separately at the end (**Annexure I**).

**Note:** Appropriate nos. of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

| | Scheme for Four Year Undergraduate Engineering Degree Programme<br>B.E. in Artificial Intelligence and Data Science - Semester- VI | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S.N. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total Marks | ESE (Time Hrs.) |
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Data Analytics | 6AD231PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| 2 | Design & Analysis of Algorithm | 6AD232PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| 3 | Cloud Computing | 6AD233PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| 4 | Program Elective Course II | 6AD234PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| 5 | Program Elective Course III | 6AD235PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 6 | Design & Analysis of Algorithm | 6AD236PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | 3Hrs. |
| 7 | Cloud Computing | 6AD237PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | 3Hrs. |
| 8 | Programme Elective Course II | 6AD238PE | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | 3Hrs. |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 9 | * Multi-disciplinary Minor#6 (MDM#6) | 6AD239MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2Hrs. |
| | **Vocational and Skill Enhancement Courses** | | | | | | | | | | | | |
| 10 | Computing Skill # 2 (VSEC-IV) | 6AD240VS | 1 | 2 | 0 | 3 | 2 | | | 50 | - | 50 | |
| DGH Revised on 29.07.2025 | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **750** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **L:Lecture** | **P:Practical** | **T:Tutorial** | **ESE: End Semester Exam** | **IE: Internal Evaluation** | **INT: Internal** | **EXT: External** |

**Programme Elective Course-II :** Natural Language Processing | Digital Forensics

**Programme Elective Course-III :** Blockchain Technology | Data Visualization Techniques

MDM#6 - Please refer the list of Multi-disciplinary Minor courses attached separately at the end (**Annexure I**).

**Note:** Appropriate nos. of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

**Scheme for Multiple Entry and Multiple Exit**

| Exit option -3 (L5.5): Award of bachelor's degree in Vocation (B.Voc.) in Major with 132 credits and an additional 8 credits | | | | |
|---|---|---|---|---|
| **EXIT Courses** | | | | |
| **S.N.** | **Course Code** | **Course Name/Type** | **Mode / Duration** | **Credits** |
| 1 | 7AD310EC | *Database Engineer/Database Administrator | Online/offline certification Course | **4** |
| AND | | | | |
| 2 | 7AD311EC | *Cloud Engineer/Cloud Administrator | | **4** |
| OR | | | | |
| 3 | 7AD406EL | Internship at IT Related Industry | Two Months (288-320 Hrs.) | **8** |

Note: The above exit courses may or may not be offered /available to students during that academic session hence it is the discretion of the department/institute to evaluate the exit course by considering either certification courses or internship from IT related Registered Industry. Students will have a choice to go for (Option 1 AND Option 2) OR (Option 3) for the exit courses.

* Certificate course shall be proposed by BoS after curetting available courses offered by the technological based industries and renowned training-cum-certification providers. These Proposed courses shall meet the skill set requirements which student must acquire. The list of curetted courses may vary as per the requirements of the employment market. These Certificate courses to be evaluated at both level i.e. Internal & External (Evaluation guidelines will be given by concerned authority in the form of SOP)

## Scheme for Four Year Undergraduate Engineering Degree Programme
### B.E. in Artificial Intelligence and Data Science - Semester- VII

| S.N. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total Marks | ESE (Time Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Deep Learning | 7AD300PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| 2 | Professional Ethics & Management | 7AD301PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| 3 | Program Elective Course IV | 7AD302PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| 4 | Program Elective Course V | 7AD303PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| 5 | Program Elective Course VI | 7AD304PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 6 | Programme Elective Course IV | 7AD305PE | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | 3 Hrs. |
| 7 | Programme Elective Course V | 7AD306PE | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | 3 Hrs. |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 8 | * Multi-disciplinary Minor#7 (MDM#7) | 7AD307MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2Hrs. |
| 9 | * Multi-disciplinary Minor#8 (MDM#8) | 7AD308ML | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | 3Hrs. |
| | **Project** | | | | | | | | | | | | |
| 10 | Project | 7AD401PR | 0 | 4 | 0 | 4 | 2 | | | 50 | 50 | 100 | |
| DGH Revised on 29.07.2025 | TOTAL | | 17 | 10 | 0 | 27 | **22** | | | | | **800** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **L:Lecture** | **P:Practical** | **T:Tutorial** | **ESE: End Semester Exam** | **IE: Internal Evaluation** | **INT: Internal** | **EXT: External** |

**Programme Elective Course-IV :** Virtual & Augmented Reality | System & Software Security
**Programme Elective Course-V :** Human Computer Interaction | Optimization Techniques
**Programme Elective Course-VI :** Distributed Ledger Technology | Cloud System & Infrastructure

* MDM#7 & MDM#8 - Please refer the list of Multi-disciplinary Minor courses attached separately at the end (**Annexure I**).

**Note:** Appropriate nos. of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

| | Scheme for Four Year Undergraduate Engineering Degree Programme<br>B.E. in Artificial Intelligence and Data Science - Semester- VIII | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S.N.** | **Course Name** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total Marks** | **ESE (Time Hrs.)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Research Methodology | 8AD309RM | 4* | 0 | 0 | 4 | 4 | 40 | 60 | | | 100 | 3Hrs. |
| 2 | Industry Internship` | 8AD402EL | 0 | 24 | 0 | 24 | 12 | | | 100 | 200 | 300 | -- |
| 3 | Project | 8AD403PR | 0 | 4 | 0 | 4 | 2 | | | 50 | 50 | 100 | 3Hrs. |
| DGH Revised on 29.07.2025 | TOTAL | | 4 | 28 | 0 | 32 | 18 | | | | | **500** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **L:Lecture** | **P:Practical** | **T:Tutorial** | **ESE: End Semester Exam** | **IE: Internal Evaluation** | **INT: Internal** | **EXT: External** |

***The course on Research Methodology may be completed by the student in Online mode (Swayam, MOOC's, any other platform approved by AICTE or on the LMS platform offered by the Institute).**

**Note:** Appropriate nos. of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

**********

**Note:**

1. The Multi-Disciplinary Minors (MDMs) offered by the Artificial Intelligence and Data Science discipline are open to students from all engineering disciplines **except** the:
   i. Computer Science and Engineering, ii. Computer Engineering, iii. Artificial Intelligence and Data Science iv. Artificial Intelligence (AI) and Data Science, v. Computer Science and Engineering (IoT), vi. Computer Science and Engineering (Artificial Intelligence and Machine Learning), vii. Computer Science and Information Technology, viii. Computer Science and Engineering (Data Science), ix. Information Technology and allied disciplines. (**Annexure I**: MDM Basket offered by CSE)
2. Students enrolled in : i. Computer Science and Engineering, ii. Computer Engineering, iii. Artificial Intelligence and Data Science iv. Artificial Intelligence (AI) and Data Science, v. Computer Science and Engineering (IoT), vi. Computer Science and Engineering (Artificial Intelligence and Machine Learning), vii. Computer Science and Information Technology, viii. Computer Science and Engineering (Data Science), ix. Information Technology and allied disciplines. are eligible to opt for MDMs offered by all other engineering disciplines. (**Refer the scheme of respective disciplines**)
3. The Baskets of Multi-Disciplinary Double Minors offered by Artificial Intelligence and Data Science discipline are listed under **Annexure II.**
4. Detailed guidelines for **Honors with Research** option is listed under **Annexure III.**
5. To promote the adoption and use of Open-Source Software (OSS), a subject-wise suggestive list of OSS tools is provided as part of this scheme. These tools can be effectively utilized for conducting practical sessions and demonstrations. Please note that this list is dynamic and may evolve with advancements in technology and the introduction of new tools or versions. **(Annexure IV:** List of suggested OSS**)**

**Annexure I**

**Multidisciplinary Minors Subjects offered by Artificial Intelligence and Data Science**

| Reference | Sem | Subject Code | Subject Title | Type | Credits |
|---|---|---|---|---|---|
| MDM#1 | III | 3AD205MD / 3CS205MD / 3KE205MD / 3DS205MD | Foundations of Computing & Programming | Theory | 2 |
| MDM#2 | IV | 4AD214MD | Essentials of Artificial Intelligence | Theory | 2 |
| MDM#3 | V | 5AD227MD | Introduction to Machine Learning | Theory | 2 |
| MDM#4 | V | 5AD228MD | AI for Engineering Applications | Theory | 2 |
| MDM#5 | V | 5AD229ML | Machine Learning Lab | Practical | 1 |
| MDM#6 | VI | 6AD239MD | Deep Learning Foundations | Theory | 2 |
| MDM#7 | VII | 7AD307MD | AI in Robotics, Healthcare, and Smart Systems | Theory | 2 |
| MDM#8 | VII | 7AD308ML | AI Tools and Frameworks Lab | Practical | 1 |

**Note:** Above is the list of Multi-Disciplinary Minors (MDMs) offered by Artificial Intelligence and Data Science discipline. These minors are open to students from all engineering disciplines except the following: i. Computer Science and Engineering, ii. Computer Engineering, iii. Artificial Intelligence and Data Science iv. Artificial Intelligence (AI) and Data Science, v. Computer Science and Engineering (IoT), vi. Computer Science and Engineering (Artificial Intelligence and Machine Learning), vii. Computer Science and Information Technology, viii. Computer Science and Engineering (Data Science), ix. Information Technology and allied disciplines.

**Annexure II**

**Multidisciplinary Double Minors Subjects offered by Artificial Intelligence and Data Science**

| Track: Blockchain Technologies (Honours / Double Minor) | | | | |
|---|---|---|---|---|
| Semester | **Subject Code** | Subject Title | Credits | T/P |
| III | 3AD245DH1 | Foundations of Blockchain | Theory | 4 |
| IV | 4AD246DH1 | Smart Contracts and DApps | Theory | 4 |
| V | 5AD247DH1 | Blockchain Protocols & Architecture | Theory | 4 |
| VI | 6AD248DH1 | Decentralized Identity and Tokenomics | Theory | 4 |
| VII | 7AD407DH1 | Blockchain Implementation Lab | Practical | 2 |

| Track: Generative AI (Honours / Double Minor) | | | | |
|---|---|---|---|---|
| Semester | **Subject Code** | Subject Title | Credits | T/P |
| III | 3AD245DH2 | Introduction to Generative AI | Theory | 4 |
| IV | 4AD246DH2 | Foundation Models and Transfer Learning | Theory | 4 |
| V | 5AD247DH2 | Multimodal Generative Models | Theory | 4 |
| VI | 6AD248DH2 | Explainability & Deployment of GenAI Models | Theory | 4 |
| VII | 7AD407DH2 | Generative AI Model Development Lab | Practical | 2 |

**Note:** The subjects offered by Artificial Intelligence and Data Science discipline as Double Minor for students of other major disciplines, shall also be applicable and treated as Honours subjects for students pursuing a major in Artificial Intelligence and Data Science.

**Annexure III**

**Honors with Research**

| Semester | **Subject Code** | Subject Title | Credits | T/P |
|---|---|---|---|---|
| VII | 7AD408HR | Research Project (Part#1)<br>Problem Identification & Definition<br>Literature Review<br>Experimental Work | 9 | P |
| VIII | 8AD409HR | Research Project (Part#2)<br>Prototype Development<br>Data Analysis<br>Publication(s) | 9 | P |

**Note:** Students intending to pursue a degree with Honours with Research must undertake and successfully complete a dedicated research project during Semesters VII and VIII, as outlined in the curriculum and in accordance with the guidelines issued by the respective department from time to time. This research project shall be distinct and independent from the regular final year project (7AD401PR & 8AD403PR).

**Annexure IV**

## Suggestive Subject-Wise list Open-Source Tools

| Name of Subject | Open-Source Tools | Name of Subject | Open-Source Tools |
|---|---|---|---|
| **Object-Oriented Programming** | Eclipse, NetBeans, IntelliJ IDEA (Community Edition), BlueJ | **Sensors & Actuators** | Arduino IDE, Raspberry Pi OS |
| **Data Structure** | Code::Blocks, Visual Studio Code, GDB Debugger | **Cryptography** | OpenSSL, GPG |
| **Data Communication & Networking** | Wireshark, Mininet, Cisco Packet Tracer (free educational license), NS-3 | **Computer Architecture & Organization** | Gem5, Logisim |
| **Operating System** | QEMU, VirtualBox, Unix/Linux Shell, FreeDOS | **Information Retrieval** | Apache Solr, Elasticsearch |
| **Artificial Intelligence** | TensorFlow, PyTorch, OpenCV, Scikit-learn | **Supervised Machine Learning** | TensorFlow, Scikit-learn |
| **Programming Methodology using Python** | Jupyter Notebook, Anaconda, PyCharm (Community Edition), VS Code | **Digital Forensics** | Autopsy, Sleuth Kit, Volatility |
| **Probability & Statistics for Data Science** | R, RStudio, NumPy, SciPy, Matplotlib | **Internet of Everything** | Node-RED, ThingsBoard, Kaa IoT |
| **Cognitive Technologies** | IBM Watson (free tier), TensorFlow, spaCy | **Image & Video Processing** | OpenCV, GIMP, FFmpeg |
| **Data Science and Statistics** | R, Jupyter Notebook, KNIME | **Augmented & Virtual Reality** | Blender, Godot Engine |
| **Internet of Things** | Arduino IDE, Node-RED, ThingsBoard | **Usability Engineering** | Axure RP (free for students), Figma |
| **Introduction to Cyber Security** | Kali Linux, Metasploit Framework, OpenVAS | **Cryptography & Security** | Wireshark, OpenSSL, VeraCrypt |
| **Database Management Systems** | MySQL, PostgreSQL, SQLite, MongoDB | **Wireless Sensor Networks** | Cooja, NS-3 |
| **Compiler Design** | LLVM, GCC, Flex, Bison | **System & Software Security** | Metasploit, Snort |
| **Numerical Methods** | Octave, SciPy, NumPy | **Blockchain Fundamentals** | Ethereum, Hyperledger, Ganache |
| **Microprocessor & Assembly Language Programming** | Keil uVision, GNUSim8085, Logisim | **Data Storage & Network** | FreeNAS, OpenFiler |
| **Design & Analysis of Algorithm** | Gephi, NetworkX | **Distributed Ledger Technology** | Hyperledger Fabric, Corda |
| **Cloud Computing** | OpenStack, CloudStack, Apache Hadoop | **Deep Learning** | Keras, TensorFlow, PyTorch |
| **Natural Language Processing** | NLTK, spaCy, Hugging Face Transformers | **Data Visualization** | Tableau Public, Matplotlib, D3.js |
| **Big Data Analytics** | Apache Hadoop, Apache Spark, Dask | **Data Warehousing** | Apache Hive, Pentaho |

| | Scheme for Four Year Undergraduate Engineering Degree Programme<br>B.E. in Computer Engineering - Semester - III | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S. N. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total Marks | ESE (Time Hrs.) |
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | Core Courses | | | | | | | | | | | | |
| 1 | Discrete Structure & Graph Theory | 3KE200PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Programming Methodology Using Python | 3KE201PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Data Structures | 3KE202PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| | Laboratory Courses | | | | | | | | | | | | |
| 4 | Comm. Engag. Project/ Field Project | 3KE400EL | 0 | 4 | 0 | 4 | 2 | | | 25 | 25 | 50 | |
| 5 | Programming Methodology Using Python | 3KE203PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 6 | Data Structure | 3KE204PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | Multidisciplinary Minor | | | | | | | | | | | | |
| 7 | * Multi-disciplinary Minor#1 (MDM#1) | 3KE205MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2 Hrs. |
| | Open Elective other than a particular Program | | | | | | | | | | | | |
| 8 | Open Elective I | 3KE206OE1/2 | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3 Hrs. |
| | HSSMC (Entrepreneurship/ Economics/ Management Course) | | | | | | | | | | | | |
| 9 | Entrepreneurship Development | 3KE207HS | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2 Hrs. |
| | Value Education Course (VEC) | | | | | | | | | | | | |
| 10 | Environmental Science | 3SH208VE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| DGH Revised on 29.07.2025 | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **700** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **L: Lecture** | **P: Practical** | **T: Tutorial** | **ESE: End Semester Exam** | **IE: Internal Evaluation** | **INT: Internal** | **EXT: External** |

**Open Elective I -** 3KE206OE1: Basics of Computing for Engineers| 3KE206OE2: E-Commerce

* MDM#1 - Please refer the list of Multi-disciplinary Minor courses attached separately at the end (**Annexure I**).
**Note:** Appropriate nos. of hour per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

| | Scheme for Four Year Undergraduate Engineering Degree Programme<br>B.E. in Computer Engineering - Semester - IV | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S. N. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total Marks | ESE (Time Hrs.) |
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Data Communication & Networking | 4KE209PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Operating System | 4KE210PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Theory of Computation | 4KE211PC | 3 | 0 | 0 | 3 | 2 | 40 | 60 | | | 100 | 3 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 4 | Data Communication & Networking | 4KE212PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 5 | Operating System | 4KE213PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 6 | * Multi-disciplinary Minor#2 (MDM#2) | 4KE214MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2 Hrs. |
| | **Vocational and Skill Enhancement Courses** | | | | | | | | | | | | |
| 7 | Computing Skill #1 (VSEC-III) | 4KE215VS | 0 | 2 | 0 | 2 | 2 | | | 50 | - | 50 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 8 | Open Elective II | 4KE216OE1/2 | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| | **HSSMC (Entrepreneurship/ Economics/ Management Course)** | | | | | | | | | | | | |
| 9 | Social Science & Engineering Economics | 4KE217EM | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| | **(Ability Enhancement Course (AEC)** | | | | | | | | | | | | |
| 10 | Modern Indian Language | 4SH218AE | 2 | 0 | 0 | 2 | 2 | | | 25 | 25 | 50 | 3 Hrs |
| | **Value Education Course (VEC)** | | | | | | | | | | | | |
| 11 | Universal Humans Values (UHV) | 4SH219VE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| DGH Revised on 29.07.2025 | TOTAL | | 19 | 06 | 0 | 25 | **22** | | | | | **700** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **L: Lecture** | **P: Practical** | **T: Tutorial** | **ESE: End Semester Exam** | **IE: Internal Evaluation** | **INT: Internal** | **EXT: External** |

**Open Elective II** – 4KE216OE1: Intellectual Property Rights| 4KE216OE2: Information Systems for Engineers

* MDM#2 - Please refer the list of Multi-disciplinary Minor courses attached separately at the end (**Annexure I**).
**Note:** Appropriate nos. of hour per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

**Scheme for Multiple Entry and Multiple Exit**

| Exit option -1 (L 5): Award of UG Diploma in Major with 88 credits and an additional 8 credits | | | | |
|---|---|---|---|---|
| **EXIT Courses** | | | | |
| **S.N.** | **Course Code** | **Course Name/Type** | **Mode / Duration** | **Credits** |
| 1 | 5KE243EC | *Network Configuration and Maintenance | Online/offline certification Course | **4** |
| AND | | | | |
| 2 | 5KE244EC | *Full Stack Web Development | | **4** |
| OR | | | | |
| 3 | 5KE405EL | Internship at IT Related Industry | Two Months (288-320 Hrs.) | **8** |

Note: The above exit courses may or may not be offered /available to students during that academic session hence it is the discretion of the department/institute to evaluate the exit course by considering either certification courses or internship from IT related Registered Industry. Students will have a choice to go for (Option 1 AND Option 2) OR (Option 3) for the exit courses.

* Certificate course shall be proposed by BoS after curetting available courses offered by the technological based industries and renowned training-cum- certification providers. These Proposed courses shall meet the skill set requirements which student must acquire. The list of curetted courses may vary as per the requirements of the employment market. These Certificate courses to be evaluated at both level i.e. Internal & External (Evaluation guidelines will be given by concerned authority in the form of SOP)

## Scheme for Four Year Undergraduate Engineering Degree Programme
### B.E. in Computer Engineering - Semester - V

| S. N. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total Marks | ESE (Time Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Database Management Systems | 5KE220PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Compiler Design | 5KE221PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Computer Architecture & Organization | 5KE222PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 4 | Programme Elective Course I | 5KE223PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 5 | Database Management Systems | 5KE224PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 6 | Compiler Design | 5KE225PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Programme Elective Course I | 5KE226PE | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 8 | * Multi-disciplinary Minor#3 (MDM#3) | 5KE227MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| 9 | * Multi-disciplinary Minor#4 (MDM#4) | 5KE228MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| 10 | * Multi-disciplinary Minor#5 (MDM#5) | 5KE229ML | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 11 | Open Elective III | 5KE230OE1/2 | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| DGH Revised on 29.07.2025 | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **750** | |

| L: Lecture | P: Practical | T: Tutorial | ESE: End Semester Exam | IE: Internal Evaluation | INT: Internal | EXT: External |
|---|---|---|---|---|---|---|

**Programme Elective Course -I :** Internet of Everything | Augmented & Virtual Reality | Introduction to Cyber Security
**Open Elective – III :** 5KE230OE1: Cyber Law & Ethics| 5KE230OE2: Introduction to Data Analytics

* MDM#3, MDM#4 & MDM#5 - Please refer the list of Multi-disciplinary Minor courses attached separately at the end (**Annexure I**).

**Note:** Appropriate nos. of hour per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

| | Scheme for Four Year Undergraduate Engineering Degree Programme<br>B.E. in Computer Engineering - Semester - VI | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S. N. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total Marks | ESE (Time Hrs.) |
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Security Policy & Governance | 6KE231PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Design & Analysis of Algorithm | 6KE232PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Cloud Computing | 6KE233PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 4 | Program Elective Course II | 6KE234PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 5 | Program Elective Course III | 6KE235PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 6 | Design & Analysis of Algorithm | 6KE236PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Cloud Computing | 6KE237PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 8 | Programme Elective Course II | 6KE238PE | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 9 | * Multi-disciplinary Minor#6 (MDM#6) | 6KE239MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| | **Vocational and Skill Enhancement Courses** | | | | | | | | | | | | |
| 10 | Computing Skill # 2 (VSEC -IV ) | 6KE240VS | 1 | 2 | 0 | 3 | 2 | | | 50 | - | 50 | |
| DGH Revised on 29.07.2025 | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **750** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **L: Lecture** | **P: Practical** | **T: Tutorial** | **ESE: End Semester Exam** | **IE: Internal Evaluation** | **INT: Internal** | **EXT: External** |

**Programme Elective Course -II :** Big Data Analytics | Natural Language Processing | Cryptography & Security

**Programme Elective Course -III :** Wireless Technology and 5G| Computer Vision | Digital Forensics

* MDM#6 - Please refer the list of Multi-disciplinary Minor courses attached separately at the end (**Annexure I**).
**Note:** Appropriate nos. of hour per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

**Scheme for Multiple Entry and Multiple Exit**

| Exit option -3 (L5.5): Award of bachelor's degree in Vocation (B.Voc.) in Major with 132 credits and an additional 8 credits | | | | |
|---|---|---|---|---|
| **EXIT Courses** | | | | |
| **S.N.** | **Course Code** | **Course Name/Type** | **Mode / Duration** | **Credits** |
| 1 | 7KE310EC | *Database Engineer/Database Administrator | Online/offline certification Course | **4** |
| AND | | | | |
| 2 | 7KE311EC | *Cloud Engineer/Cloud Administrator | | **4** |
| OR | | | | |
| 3 | 7KE406EL | Internship at IT Related Industry | Two Months (288-320 Hrs.) | **8** |

Note: The above exit courses may or may not be offered /available to students during that academic session hence it is the discretion of the department/institute to evaluate the exit course by considering either certification courses or internship from IT related Registered Industry. Students will have a choice to go for (Option 1 AND Option 2) OR (Option 3) for the exit courses.

* Certificate course shall be proposed by BoS after curetting available courses offered by the technological based industries and renowned training-cum-certification providers. These Proposed courses shall meet the skill set requirements which student must acquire. The list of curetted courses may vary as per the requirements of the employment market. These Certificate courses to be evaluated at both level i.e. Internal & External (Evaluation guidelines will be given by concerned authority in the form of SOP)

| | Scheme for Four Year Undergraduate Engineering Degree Programme<br>B.E. in Computer Engineering - Semester - VII | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S. N.** | **Course Name** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total Marks** | **ESE (Time Hrs.)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Software Engineering | 7KE300PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Professional Ethics & Management | 7KE301PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Program Elective Course IV | 7KE302PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 4 | Program Elective Course V | 7KE303PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 5 | Program Elective Course VI | 7KE304PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 6 | Programme Elective Course IV | 7KE305PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Programme Elective Course V | 7KE306PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 8 | * Multi-disciplinary Minor#7 (MDM#7) | 7KE307MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2 Hrs. |
| 9 | * Multi-disciplinary Minor#8 (MDM#8) | 7KE308ML | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Project** | | | | | | | | | | | | |
| 10 | Project | 7KE401PR | 0 | 4 | 0 | 4 | 2 | | | 50 | 50 | 100 | |
| DGH Revised on 29.07.2025 | TOTAL | | 17 | 10 | 0 | 27 | **22** | | | | | **800** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **L: Lecture** | **P: Practical** | **T: Tutorial** | **ESE: End Semester Exam** | **IE: Internal Evaluation** | **INT: Internal** | **EXT: External** |

**Programme Elective Course -IV :** Penetration Testing | Genetic Algorithms and Fuzzy Systems | Software Testing & Quality Assurance
**Programme Elective Course -V :** Block chain Fundamentals | Real Time Systems | Quantum Computing
**Programme Elective Course -VI :** Optimization Techniques | Human Computer Interaction | Cloud System & Infrastructure

MDM#7 & MDM#8 - Please refer the list of Multi-disciplinary Minor courses attached separately at the end (**Annexure I**).

**Note:** Appropriate nos. of hour per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

| | Scheme for Four Year Undergraduate Engineering Degree Programme<br>B.E. in Computer Engineering - Semester - VIII | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S. N. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total Marks | ESE (Time Hrs.) |
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | Core Courses | | | | | | | | | | | | |
| 1 | Research Methodology | 8KE309RM | 4* | 0 | 0 | 4 | 4 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Industry Internship | 8KE402EL | 0 | 24 | 0 | 24 | 12 | | | 100 | 200 | 300 | -- |
| 3 | Project | 8KE403PR | 0 | 4 | 0 | 4 | 2 | | | 50 | 50 | 100 | 3 Hrs. |
| DGH Revised on 29.07.2025 | TOTAL | | 4 | 28 | 0 | 32 | 18 | | | | | **500** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **L: Lecture** | **P: Practical** | **T: Tutorial** | **ESE: End Semester Exam** | **IE: Internal Evaluation** | **INT: Internal** | **EXT: External** |

***The course on Research Methodology may be completed by the student in Online mode (Swayam, MOOC's, any other platform approved by AICTE or on the LMS platform offered by the Institute).**

**Note:** Appropriate nos. of hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

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**Note:**

1. The Multi-Disciplinary Minors (MDMs) offered by the Computer Engineering discipline are open to students from all engineering disciplines **except** the: i. Computer Science and Engineering, ii. Computer Engineering, iii. Artificial Intelligence and Data Science iv. Artificial Intelligence (AI) and Data Science, v. Computer Science and Engineering (IoT), vi. Computer Science and Engineering (Artificial Intelligence and Machine Learning), vii. Computer Science and Information Technology, viii. Computer Science and Engineering (Data Science), ix. Information Technology and allied disciplines. (**Annexure I**: MDM Basket offered by CSE)
2. Students enrolled in : i. Computer Science and Engineering, ii. Computer Engineering, iii. Artificial Intelligence and Data Science iv. Artificial Intelligence (AI) and Data Science, v. Computer Science and Engineering (IoT), vi. Computer Science and Engineering (Artificial Intelligence and Machine Learning), vii. Computer Science and Information Technology, viii. Computer Science and Engineering (Data Science), ix. Information Technology and allied disciplines. are eligible to opt for MDMs offered by all other engineering disciplines. (**Refer the scheme of respective disciplines**)
3. The Baskets of Multi-Disciplinary Double Minors offered by Computer Engineering discipline are listed under **Annexure II.**
4. Detailed guidelines for **Honors with Research** option is listed under **Annexure III.**
5. To promote the adoption and use of Open-Source Software (OSS), a subject-wise suggestive list of OSS tools is provided as part of this scheme. These tools can be effectively utilized for conducting practical sessions and demonstrations. Please note that this list is dynamic and may evolve with advancements in technology and the introduction of new tools or versions. **(Annexure IV:** List of suggested OSS**)**

## Annexure I

### Multidisciplinary Minors Subjects offered by Computer Engineering

| Reference | Sem | Subject Code | Subject Title | Type | Credits |
|---|---|---|---|---|---|
| MDM#1 | III | 3KE205MD / 3CS205MD / 3DS205MD / 3AD205MD | Foundations of Computing & Programming | Theory | 2 |
| MDM#2 | IV | 4KE214MD | Operating Systems Fundamentals | Theory | 2 |
| MDM#3 | V | 5KE227MD | Software Engineering Principles | Theory | 2 |
| MDM#4 | V | 5KE228MD | Mobile Application Development | Theory | 2 |
| MDM#5 | V | 5KE229ML | Mobile App Development Lab | Practical | 1 |
| MDM#6 | VI | 6KE239MD | DevOps and Software Deployment Practices | Theory | 2 |
| MDM#7 | VII | 7KE307MD | Full Stack Web Development | Theory | 2 |
| MDM#8 | VII | 7KE308ML | Software Project Lab | Practical | 1 |

**Note:** Above is the list of Multi-Disciplinary Minors (MDMs) offered by Computer Engineering discipline. These minors are open to students from all engineering disciplines except the following: i. Computer Science and Engineering, ii. Computer Engineering, iii. Artificial Intelligence and Data Science iv. Artificial Intelligence (AI) and Data Science, v. Computer Science and Engineering (IoT), vi. Computer Science and Engineering (Artificial Intelligence and Machine Learning), vii. Computer Science and Information Technology, viii. Computer Science and Engineering (Data Science), ix. Information Technology and allied disciplines.

## Annexure II

## Multidisciplinary Double Minors Subjects offered by Computer Engineering

| Track: Internet of Things (IoT) (Honours / Double Minor) | | | | |
|---|---|---|---|---|
| Semester | **Subject Code** | Subject Title | Credits | T/P |
| III | 3KE245DH1 | Fundamentals of IoT and Smart Devices | 4 | Theory |
| IV | 4KE246DH1 | IoT Architectures and Communication Protocols | 4 | Theory |
| V | 5KE247DH1 | IoT Data Management and Edge Integration | 4 | Theory |
| VI | 6KE248DH1 | IoT Security and Ethical Design | 4 | Theory |
| VII | 7KE407DH1 | Smart IoT Lab: Projects and Prototyping | 2 | Lab |

| Track: Edge Computing (Honours / Double Minor) | | | | |
|---|---|---|---|---|
| Semester | **Subject Code** | Subject Title | Credits | T/P |
| III | 3KE245DH2 | Introduction to Edge and Fog Computing | 4 | Theory |
| IV | 4KE246DH2 | Edge Devices and Embedded Systems | 4 | Theory |
| V | 5KE247DH2 | Real-Time Data Processing at the Edge | 4 | Theory |
| VI | 6KE248DH2 | Scalable Edge Architectures and Microservices | 4 | Theory |
| VII | 7KE407DH2 | Edge Computing Lab: Deployment and Simulation | 2 | Lab |

**Note:** The subjects offered by Computer Engineering discipline as Double Minor for students of other major disciplines, shall also be applicable and treated as Honours subjects for students pursuing a major in Computer Engineering.

## Annexure III

## Honors with Research

| Semester | **Subject Code** | Subject Title | Credits | T/P |
|---|---|---|---|---|
| VII | 7KE408HR | Research Project (Part#1)<br>Problem Identification & Definition<br>Literature Review<br>Experimental Work | 9 | P |
| VIII | 8KE409HR | Research Project (Part#2)<br>Prototype Development<br>Data Analysis<br>Publication(s) | 9 | P |

**Note:** Students intending to pursue a degree with Honours with Research must undertake and successfully complete a dedicated research project during Semesters VII and VIII, as outlined in the curriculum and in accordance with the guidelines issued by the respective department from time to time. This research project shall be distinct and independent from the regular final year project (7KE401PR & 8KE403PR).

## Annexure IV

### Suggestive Subject-Wise list Open-Source Tools

| Name of Subject | Open-Source Tools | Name of Subject | Open-Source Tools |
|---|---|---|---|
| **Object-Oriented Programming** | Eclipse, NetBeans, IntelliJ IDEA (Community Edition), BlueJ | **Sensors & Actuators** | Arduino IDE, Raspberry Pi OS |
| **Data Structure** | Code::Blocks, Visual Studio Code, GDB Debugger | **Cryptography** | OpenSSL, GPG |
| **Data Communication & Networking** | Wireshark, Mininet, Cisco Packet Tracer (free educational license), NS-3 | **Computer Architecture & Organization** | Gem5, Logisim |
| **Operating System** | QEMU, VirtualBox, Unix/Linux Shell, FreeDOS | **Information Retrieval** | Apache Solr, Elasticsearch |
| **Artificial Intelligence** | TensorFlow, PyTorch, OpenCV, Scikit-learn | **Supervised Machine Learning** | TensorFlow, Scikit-learn |
| **Programming Methodology using Python** | Jupyter Notebook, Anaconda, PyCharm (Community Edition), VS Code | **Digital Forensics** | Autopsy, Sleuth Kit, Volatility |
| **Probability & Statistics for Data Science** | R, RStudio, NumPy, SciPy, Matplotlib | **Internet of Everything** | Node-RED, ThingsBoard, Kaa IoT |
| **Cognitive Technologies** | IBM Watson (free tier), TensorFlow, spaCy | **Image & Video Processing** | OpenCV, GIMP, FFmpeg |
| **Data Science and Statistics** | R, Jupyter Notebook, KNIME | **Augmented & Virtual Reality** | Blender, Godot Engine |
| **Internet of Things** | Arduino IDE, Node-RED, ThingsBoard | **Usability Engineering** | Axure RP (free for students), Figma |
| **Introduction to Cyber Security** | Kali Linux, Metasploit Framework, OpenVAS | **Cryptography & Security** | Wireshark, OpenSSL, VeraCrypt |
| **Database Management Systems** | MySQL, PostgreSQL, SQLite, MongoDB | **Wireless Sensor Networks** | Cooja, NS-3 |
| **Compiler Design** | LLVM, GCC, Flex, Bison | **System & Software Security** | Metasploit, Snort |
| **Numerical Methods** | Octave, SciPy, NumPy | **Blockchain Fundamentals** | Ethereum, Hyperledger, Ganache |
| **Microprocessor & Assembly Language Programming** | Keil uVision, GNUSim8085, Logisim | **Data Storage & Network** | FreeNAS, OpenFiler |
| **Design & Analysis of Algorithm** | Gephi, NetworkX | **Distributed Ledger Technology** | Hyperledger Fabric, Corda |
| **Cloud Computing** | OpenStack, CloudStack, Apache Hadoop | **Deep Learning** | Keras, TensorFlow, PyTorch |
| **Natural Language Processing** | NLTK, spaCy, Hugging Face Transformers | **Data Visualization** | Tableau Public, Matplotlib, D3.js |
| **Big Data Analytics** | Apache Hadoop, Apache Spark, Dask | **Data Warehousing** | Apache Hive, Pentaho |

| | Scheme for Second Year Four Year Undergraduate Engineering Degree Programme<br>B.E. in Information Technology (Semester -III) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sr No.** | **Course Name** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total** | **ESE Time Hrs.)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Discrete Structure & Graph Theory | 3IT200PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 2 | Object Oriented Programming | 3IT201PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 3 | Analog & Digital Electronics | 3IT202PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 4 | Community Engagement Project* / Field Project ** | 3IT400EL | 0 | 4 | 0 | 4 | 2 | | | 25 | 25 | 50 | |
| 5 | Object Oriented Programming | 3IT203PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 6 | Analog & Digital Electronics | 3IT204PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 7 | Multidisciplinary Minor-I* | 3IT205MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00 Hrs. |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 8 | Open Elective -I | 3IT206OE1/2/3 | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3.00 Hrs. |
| | **HSSMC (Entrepreneurship/ Economics/ Management Course)** | | | | | | | | | | | | |
| 9 | Entrepreneurship Development | 3IT207EM | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00 Hrs. |
| | **Value Education Course (VEC)** | | | | | | | | | | | | |
| 10 | Environmental Science | 3SH208VE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | TOTAL | | 18 | 8 | 0 | 26 | **22** | | | | | **700** | |

**L: Lecture** **P: Practical** **T: Tutorial** **ESE: End Semester Exam** **IE: Internal Evaluation** **INT: Internal** **EXT: External**

Open Elective I – i) 3IT206OE1: Cyber Law ii) 3IT206OE2: Web Technology iii) 3IT206OE3: Internet of Things (IOT) Note : Suitable number of hours per week are allotted for continuous evaluation process for above subjects. (Total contact hours per week= 42 Hours)

*Please refer list of Multidisciplinary Minor courses attached separately

| | Scheme for Second Year Four Year Undergraduate Engineering Degree Programme<br>B.E. in Information Technology (Semester -IV) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sr No.** | **Course Name** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total** | **ESE Time Hrs.)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Data Structures | 4IT209PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 2 | Data Communication & Networking | 4IT210PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 3 | Computer Organization & Architecture | 4IT211PC | 2 | 0 | 0 | 2 | 2 | 40 | 60 | | | 100 | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 4 | Data Structures | 4IT212PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 5 | Data Communication & Networking | 4IT213PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 6 | Multidisciplinary Minor -II* | 4IT214MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00 Hrs. |
| | **Vocational and Skill Enhancement Courses** | | | | | | | | | | | | |
| 7 | Computer Skills-I | 4IT215VS | 1 | 2 | 0 | 3 | 2 | | | 50 | - | 50 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 8 | Open Elective- II | 4IT216OE1/2/3 | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | **HSSMC (Entrepreneurship/ Economics/ Management Course)** | | | | | | | | | | | | |
| 9 | IT Ethics and Management | 4IT217EM | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | **(Ability Enhancement Course (AEC)** | | | | | | | | | | | | |
| 10 | Modern Indian Language | 4SH218AE | 2 | 0 | 0 | 2 | 2 | | | 25 | 25 | 50 | . |
| | **Value Education Course (VEC)** | | | | | | | | | | | | |
| 11 | Universal Human Value & Ethics | 4SH219VE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | TOTAL | | 19 | 06 | 0 | 25 | **22** | | | | | **700** | |

**L: Lecture** **P: Practical** **T: Tutorial** **ESE: End Semester Exam** **IE: Internal Evaluation** **INT: Internal** **EXT: External** Open Elective II – i) 4IT216OE1: Intellectual Property Right ii) 4IT216OE2: Artificial Intelligence iii) 4IT216OE3: E-Commerce Note : Suitable number of hours per week are allotted for continuous evaluation process for above subjects. (Total contact hours per week= 42 Hours)

*Please refer list of Multidisciplinary Minor courses attached separately

**Scheme for Multiple Entry and Exit**

| **Exit option -2 (L5.0): Award of UG Diploma in Major with 88 credits and an additional 8 ts cred** | | | |
|---|---|---|---|
| **Exit Courses** | | | |
| 1 | 5IT243EC: NPTEL Course on Operating Systems | **Online certification Course** | **4** |
| | AND | | |
| 2 | 5IT244EC : NPTEL Course on Database Management Systems | | **4** |
| | OR | | |
| 3 | 5IT2405EL: Two Month Internship at Industry (288-320 Hours) | | **8** |

| | Scheme for Third Year Four Year Undergraduate Engineering Degree Programme<br>B.E. in Information Technology (Semester -V) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sr No.** | **Course Name** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total** | **ESE Time Hrs.)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Database Management Systems | 5IT220PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 2 | Operating Systems | 5IT221PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 3 | Theory of Computation | 5IT222PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 4 | Program Elective Course -I | 5IT223PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 5 | Database Management Systems | 5IT224PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 6 | Operating Systems | 5IT225PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Programme Elective Course -I | 5IT226PE | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 8 | Multidisciplinary Minor -III * | 5IT227MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| 9 | Multidisciplinary Minor -IV* | 5IT228MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| 10 | Multidisciplinary Minor Lab-I* | 5IT229ML | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 11 | Open Elective- III | 5IT230OE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **750** | |

**L: Lecture** **P: Practical** **T: Tutorial** **ESE: End Semester Exam** **IE: Internal Evaluation** **INT: Internal** **EXT: External**

Program Elective Course I – i) Information Security Systems ii) Data Science & Statistics iii) Internet of Things

Open Elective III – i) 5IT230OE1: Fundamentals of Cyber Security ii) 5IT230OE2: Design Thanking & Innovation iii) 5IT230OE3: Principals of Management

Note : Suitable number of hours per week are allotted for continuous evaluation process for above subjects. (Total contact hours per week= 42 Hours)

*Please refer list of Multidisciplinary Minor courses attached separately

| | Scheme for Third Year Four Year Undergraduate Engineering Degree Programme B.E. in Information Technology (Semester -VI) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sr No.** | **Course Name** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total** | **ESE Time Hrs.)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Compiler Design | 6IT231PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 2 | Design & Analysis of Algorithm | 6IT232PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 3 | Artificial Intelligence | 6IT233PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 4 | Program Elective Course -II | 6IT234PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 5 | Program Elective Course -III | 6IT235PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 6 | Compiler Design | 6IT236PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Design & Analysis of Algorithm | 6IT237PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 8 | Artificial Intelligence | 6IT238PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 9 | Multidisciplinary Minor -V * | 6IT239MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | **Vocational and Skill Enhancement Courses** | | | | | | | | | | | | |
| 10 | Computer Skills - I | 6IT240VS | 1 | 2 | 0 | 3 | 2 | | | 50 | - | 50 | |
| | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **750** | |

**L: Lecture P: Practical T: Tutorial ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External**

Program Elective Course –II i) Cryptography ii) Network Security ii) Big Data Analytics Program Elective Course –III i) Cyber Security ii) Cognitive Technology iii) Software Testing

Note : Suitable number of hours per week are allotted for continuous evaluation process for above subjects. (Total contact hours per week= 42 Hours)
*Please refer list of Multidisciplinary Minor courses attached separately

**Scheme for Multiple Entry and Exit**

| **Exit option -3 (L5.5): Award of B-Voc in Major with 132 credits and an additional 8 cred ts** | | | |
|---|---|---|---|
| **Exit Courses** | | | |
| 1 | 7IT246EC: Certified Database Engineer (Oracle, DB2) | **Online certification Course** | **4** |
| | AND | | |
| 2 | 7IT247EC: Certified Cloud Engineer (AWS,AZURE) | | **4** |
| | OR | | |
| 3 | 7IT2406EL: Two Month (288-320 Hours) Internship at Industry | | **8** |

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## Scheme for Fourth Year Four Year Undergraduate Engineering Degree Programme
## B.E. in Information Technology (Semester -VII)

| Sr No. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total | ESE Time Hrs) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Software Engineering | 7IT300PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 2 | Object Oriented Analysis & Design | 7IT301PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 3 | Program Elective Course -IV | 7IT302PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 4 | Program Elective Course -V | 7IT303PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 5 | Program Elective Course -VI | 7IT304PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 6 | Software Engineering | 7IT305PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Object Oriented Analysis & Design | 7IT306PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 8 | Multidisciplinary Minor -VI* | 7IT307MD | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| 9 | Multidisciplinary Minor Lab -II * | 7IT308ML | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | . |
| | **Project** | | | | | | | | | | | | |
| 10 | Project | 7IT401PR | 0 | 4 | 0 | 4 | 2 | | | 50 | 50 | 100 | |
| | TOTAL | | 17 | 10 | 0 | 27 | **22** | | | | | **800** | |

**L: Lecture** **P: Practical** **T: Tutorial** **ESE: End Semester Exam** **IE: Internal Evaluation** **INT: Internal** **EXT: External**

Program Elective Course –IV i) Machine Learning ii) Dataware Housing & Data Mining iii) Blockchain Fundamentals Program Elective Course –V i) Business Intelligence ii) Cloud Computing iii) Digital Forensics

Program Elective Course –VI i) Mobile Computing ii) Embedded System iii) Virtual & Augmented Reality

Note : Suitable number of hours per week are allotted for continuous evaluation process for above subjects. (Total contact hours per week= 42 Hours)

*Please refer list of Multidisciplinary Minor courses attached separately

| | Scheme for Fourth Year Four Year Undergraduate Engineering Degree Programme<br>B.E. in Information Technology (Semester -VIII) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sr No.** | **Course Name** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total** | **ESE Time Hrs)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Research Methodology | 8IT309RM | 4* | | | 4 | 4 | 40 | 60 | | | 100 | 3.00 Hrs. |
| 2 | Industry Internship | 8IT402EL | 0 | 24 | 0 | 24 | 12 | | | 100 | 200 | 300 | -- |
| 3 | Project | 8IT403PR | 0 | 4 | 0 | 4 | 2 | | | 50 | 50 | 100 | --. |
| | TOTAL | | 4 | 28 | 0 | 32 | 18 | | | | | **500** | |

**L: Lecture** **P: Practical** **T: Tutorial** **ESE: End Semester Exam** **IE: Internal Evaluation** **INT: Internal** **EXT: External**

Note : Suitable number of hours per week are allotted for continuous evaluation process for above subjects. (Total contact hours per week= 42 Hours)

***The course on Research Methodology may be completed by the student in Online mode (Swayam, MOOC's, any other platform approved by AICTE OR on the LMS platform offered by the Institute).**

Note: The Multi-Disciplinary Minors (MDMs) offered by the Department of Information Technology are open to all students from all engineering deciplines **Except** the i. Information Technology , ii. Computer Science & Engineering , iii. Computer Engineering , iv. Computer Science & Engineering (Data Science) , v.Artificial Intelligence & Data Science (AIDS) vi, allied disciplines.

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## Annexure I Multidisciplinary Minor Subjects offered by

## Information Technology

| Sem | MDM | Course Code | Credit | | Course Name |
|---|---|---|---|---|---|
| | | | T | P | |
| III | MDM-I | 3IT205MD | 2 | 0 | Introduction to Data Structures |
| IV | MDM-II | 4IT214MD | 2 | 0 | Introduction to Operating Systems |
| V | MDM-III | 5IT227MD | 2 | 0 | Computer Networks |
| | MDM-IV | 5IT228MD | 2 | 0 | Object Oriented Programming |
| | MDM-Lab I | 5IT229ML | 0 | 1 | Object Oriented Programming Lab |
| VI | MDM-V | 6IT239MD | 2 | 0 | Software Project Management |
| VII | MDM-VI | 7IT307MD | 2 | 0 | Database Management System |
| | MDM-Lab II | 7IT308ML | 0 | 1 | Database Management System Lab |
| | | | 12 | 02 | |

List of Courses for Double Minor / Honours in " Advanced Databases'

To be offered as Honours for Information Technology Discipline for other major discipline it may be offered as Double Minor

| **Track: Advanced Databases (Honours / Double Minor)** | | | | |
|---|---|---|---|---|
| Semester | Subject Code | Subject Title | Credits | T/P |
| III | 3IT245DH1 | Introduction to Databases | 4 | T |
| IV | 4IT246DH1 | SQL and NoSQL Databases | 4 | T |
| V | 5IT247DH1 | Big Data and Data Lakes | 4 | T |
| VI | 6IT248DH1 | Databases with Java | 4 | T |
| VII | 7IT407DH1 | Mini Project | 2 | P |
| | | | 18 | |

List of Courses for Double Minor / Honours in " Data Science And Analytics"

To be offered as Honours for Information Technology Discipline for other major discipline it may be offered as Double Minor

| **Track: Data Science and Analytics (Honours / Double Minor)** | | | | |
|---|---|---|---|---|
| Semester | Subject Code | Subject Title | Credits | T/P |
| III | 3IT245DH2 | Data Science | 4 | T |
| IV | 4IT246DH2 | Natural Language Processing | 4 | T |
| V | 5IT247DH2 | Big Data Analytics | 4 | T |
| VI | 6IT248DH2 | Intelligent Systems | 4 | T |
| VII | 7IT407DH2 | Mini Project using Intelligent Systems, Computational Learning, DL, BDA, DS or NLP Concepts | 2 | P |
| | | | 18 | |

List of Courses for B.E. Information Technology Honours with Research Degree

| Sr. No. | Course Code | Proposed in Semester | Credits | Course name |
|---|---|---|---|---|
| 1 | 7IT408HR | VII | 9 | Research Project (Part 1) Problem Identification and definitions, Literature Review, Experimental Work |
| 2 | 8IT409HR | VIII | 9 | Research Project (Part 2) Prototype Development, Data Analysis, Publication |
| | | **Total** | **18** | |

## Nomenclature: Name of Department offering the courses

| Acronym | Discipline of engineering/Department offering the course |
|---|---|
| SH | Science and Humanities |
| ME | Mechanical Engineering |
| EE | Electrical Engineering |
| CS | Computer Science and Engineering |
| CE | Civil Engineering |
| IT | Information Technology |
| ET | Electronics & Telecommunication Engg. |
| TX | Textile Engineering |
| EP | Electrical (Electronics & Power) Engg. |
| AD | Artificial Engineering and Data Science |
| CH | Chemical Engineering |
| DS | CSE (Data Science) |

| **Acronym** | **Course/Subject Vertical** |
|---|---|
| BS | Basic Science Course |
| BL | Basic Science Laboratory |
| ES | Engineering Science Course |
| EL | Experiential Learning |
| PC | Program Course |
| PL | Program Laboratory |
| PE | Program Elective Course |
| MD | Multidisciplinary Minor Course |
| ML | Multidisciplinary Minor Laboratory |
| OE | Open Elective |
| EC | Exit Course |
| DH | Double Minor / Hons. Courses |

| **Acronym** | **Course/Subject Vertical** |
|---|---|
| VS | Vocational Skill Enhancement Course |
| AE | Ability Enhancement Course |
| EM | Entrepreneurship/Economics/Management Course |
| IK | Indian Knowledge System |
| VE | Value Education Course |
| RM | Research Methodology |
| FP | Field Project |
| II | Industry Internship |
| PR | Project |
| CC | Co-curricular Course |
| AL | All (Common for all Branches) |
| HR | Honours with Research |

## Scheme for Second Year -Four Year UG Engineering Degree Programme
## B. E. Electrical Engineering (Electronics & Power) (Semester-III)

| SN | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | | | Theory (Total) | | Practical Evaluation | | | | Practical (Total) | | ESE Time (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | External | | Internal | | | | External | | Internal | | | | |
| | | | L | P | T | Hrs. | | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | |
| | **Core Courses** | | | | | | | | | | | | | | | | | | | |
| 1 | Numerical Methods & Optimization Techniques | 3EP200PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 2 | Electrical Circuit Analysis | 3EP201PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 3 | Electrical Measurements and Instrumentation | 3EP202PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | | | | | | | | |
| 5 | Community Engagement Project/ Field Project (related to Major) | 3EP400EL | 0 | 4 | 0 | 4 | 2 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 6 | Electrical Circuit Analysis Lab | 3EP203PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 7 | Electrical Measurements and Instrumentation Lab | 3EP204PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Multi-Disciplinary Minor (MDM)** | | | | | | | | | | | | | | | | | | | |
| 8 | Electrical Energy Generation | 3EP205MD | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | | | | | | | | |
| 9 | Open Elective I | 3EP206OE | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| | **HSSMC (Entrepreneurship/ Economics/ Management Course)** | | | | | | | | | | | | | | | | | | | |
| 10 | Entrepreneurship Development | 3EP207EM | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | **Value Education Course (VEC)** | | | | | | | | | | | | | | | | | | | |
| 11 | Environmental Science | 3AL208VE | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **550** | | | | | | **150** | | |

Open Elective I: 1.Power Supply System (3EP206OE1), 2. Energy Generation& Utilization (3EP206OE2)

Note:Six hours per week are allotted for continuous evaluation process for the above subjects.(Total contact hours per week=34Hours)

**Scheme for Second Year - Four Year UG Engineering Degree Programme**
**B. E. Electrical Engineering (Electronics & Power)**
**(Semester-IV)**

| SN | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | | | Theory (Total) | | Practical Evaluation | | | | Practical (Total) | | ESE Time (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | External | | Internal | | | | External | | Internal | | | | |
| | | | L | P | T | Hrs. | | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | |
| | **Core Courses** | | | | | | | | | | | | | | | | | | | |
| 1 | Electrical Machines – I | 4EP209PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 2 | Control System | 4EP210PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 3 | Electromagnetic Fields | 4EP211PC | 2 | 0 | 0 | 2 | 2 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | | | | | | | | |
| 4 | Electrical Machines - I lab | 4EP212PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 5 | Control System Lab | 4EP213PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Multi-Disciplinary Minor (MDM)** | | | | | | | | | | | | | | | | | | | |
| 6 | Electrical Measurements | 4EP214MD | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs |
| | **Vocational & Skill Enhancement Courses (VSEC)** | | | | | | | | | | | | | | | | | | | |
| 7 | Electrical Software Lab | 4EP215VS | 1 | 2 | 0 | 3 | 2 | | | | | | | | | 50 | 25 | 50 | 25 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | | | | | | | | |
| 8 | Open Elective II | 4EP216OE | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | **HSSMC (Entrepreneurship/ Economics/ Management Course)** | | | | | | | | | | | | | | | | | | | |
| 9 | Engineering Economics | 4EP217EM | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | **Ability Enhancement Courses (AEC)** | | | | | | | | | | | | | | | | | | | |
| 10 | Modern Indian Language | 4AL218AE | 2 | 0 | 0 | 2 | 2 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Value Education Course (VEC)** | | | | | | | | | | | | | | | | | | | |
| 11 | Universal Human Values | 4AL219VE | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | TOTAL | | 19 | 06 | 0 | 25 | **22** | | | | | **500** | | | | | | **200** | | |

Open Elective II: 1. Electrical Drives(4EP216OE1) 2.Electrical Machines(4EP216OE2)

Note:Six hours per week are allotted for continuous evaluation process for the above subjects.(Total contact hours per week=34Hours)

Scheme for Multiple Entry and Exit

| **Exit option 2 (L5.0): Award of UG Diploma in Major with 88 credits and an additional 8 credits** | | | | |
|---|---|---|---|---|
| **Exit Courses** | | | | |
| 1 | 5EP243EC | Electrical Panel Design and Implementation | Work based vocational courses/training during summer vacation.<br><br>(Minimum 4 Week/course) | **4** |
| 2 | 5EP244EC | Repairing and maintenance of Electrical Machines | | **4** |
| **OR** | | | | |
| 3 | 5EP405EL | Internship / Apprenticeship | During Summer Vacation (Minimum 8 Week) | **8** |

**Scheme for Third Year - Four Year UG Engineering Degree Programme**
**B. E. Electrical Engineering (Electronics & Power)**
**(Semester-V)**

| SN | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | | | Theory (Total) | | Practical Evaluation | | | | Practical (Total) | | ESE Time (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | External | | Internal | | | | External | | Internal | | | | |
| | | | L | P | T | Hrs. | | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | |
| | **Core Courses** | | | | | | | | | | | | | | | | | | | |
| 1 | Electronics Components & Circuits | 5EP220PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 2 | Electrical Machines – II | 5EP221PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 3 | Power System – I | 5EP222PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 4 | Program Elective Course – I | 5EP223PE | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | | | | | | | | |
| 5 | Electronics Components & Circuits Lab | 5EP224PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 6 | Electrical Machines – II Lab | 5EP225PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 7 | Power System – I Lab | 5EP226PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Multi-Disciplinary Minor (MDM)** | | | | | | | | | | | | | | | | | | | |
| 8 | DC Machines | 5EP227MD | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| 9 | AC Machines | 5EP228MD | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| 10 | Electrical Machines Lab | 5EP229MD | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | | | | | | | | |
| 11 | Open Elective III | 5EP230OE | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **550** | | | | | | **200** | | |

Program Elective Course-I: 1. Advanced Control System (5EP223PE1), 2.Industrial Automation (5EP223PE2) 3. Process Control System (5EP223PE3) Open Elective III: 1.Energy Audit &Management (5EP230OE1)2.Electrical Estimation &Costing(5EP230OE2)

**Note:Six hours per week are allotted for continuous evaluation process for the above subjects.(Total contact hours per week=34Hours)**

**Scheme for Third Year -Four Year UG Engineering Degree Programme**
**B. E. Electrical Engineering (Electronics & Power)**
**(Semester-VI)**

| SN | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | | | Theory (Total) | | Practical Evaluation | | | | Practical (Total) | | ESE Time (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | External | | Internal | | | | External | | Internal | | | | |
| | | | L | P | T | Hrs. | | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | |
| | **Core Courses** | | | | | | | | | | | | | | | | | | | |
| 1 | Power Electronics | 6EP231PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 2 | Microprocessor & Microcontroller | 6EP232PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 3 | Power System – II | 6EP233PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 4 | Program Elective Course-II | 6EP234PE | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 5 | Program Elective Course-III | 6EP235PE | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | | | | | | | | |
| 6 | Power Electronics Lab | 6EP236PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 7 | Microprocessor & Microcontroller Lab | 6EP237PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 8 | Power System – II Lab | 6EP238PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Multi-Disciplinary Minor (MDM)** | | | | | | | | | | | | | | | | | | | |
| 9 | Basic Power System | 6EP239MD | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | **Vocational and Skill Enhancement Courses** | | | | | | | | | | | | | | | | | | | |
| 10 | PLC &Industrial Automation Lab | 6EP240VS | 1 | 2 | 0 | 3 | 2 | | | | | | | | | 50 | 25 | 50 | 25 | |
| | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **550** | | | | | | **200** | | |

Program Elective Course-II: 1. Electrical Energy Distribution & Utilization (6EP234PE1) 2. Electrical Distribution & Substation Automation(6EP234PE2) 3. Electrical Estimation &Costing(6EP234PE3)

Program Elective Course-III: 1. Electrical Machine Design (6EP235PE1) 2. Generalized Machine Theory (6EP235PE2) ,3. Electrical Drives & Control (6EP235PE3) Note:Six hours per week are allotted for continuous evaluation process for the above subjects.(Total contact hours per week=34Hours)

Scheme for Multiple Entry and Exit

| **Exit option 3 (L5.5): Award of UG Degree in Major with 132 credits and an additional 8 credits** | | | | |
|---|---|---|---|---|
| **Exit Courses** | | | | |
| 1 | 7EP310EC | Industrial Electrical systems installation and maintenance | Work based vocational courses/training during summer vacation.<br><br>(Minimum 4 Week/course) | **4** |
| 2 | 7EP311EC | PCB Design and Circuit Simulation | | **4** |
| **OR** | | | | |
| 3 | 7EP406EL | Internship / Apprenticeship | During Summer vacation (Minimum 8 week) | **8** |

**Scheme for Fourth Year - Four Year UG Engineering Degree Programme**
**B. E. Electrical Engineering (Electronics & Power)**
**(Semester-VII)**

| SN | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | | | Theory (Total) | | Practical Evaluation | | | | Practical (Total) | | ESE Time (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | External | | Internal | | | | External | | Internal | | | | |
| | | | L | P | T | Hrs. | | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | |
| | **Core Courses** | | | | | | | | | | | | | | | | | | | |
| 1 | Power System Protection | 7EP300PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 2 | Digital Signal Processing | 7EP301PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 3 | Program Elective Course-IV | 7EP302PE | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 4 | Program Elective Course-V | 7EP303PE | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 5 | Program Elective Course-VI | 7EP304PE | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | | | | | | | | |
| 6 | Power System Protection lab | 7EP305PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 7 | Digital Signal Processing lab | 7EP306PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Multi-Disciplinary Minor (MDM)** | | | | | | | | | | | | | | | | | | | |
| 8 | Energy Audit & Management | 7EP307MD | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| 9 | Power System Lab | 7EP308MD | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Project** | | | | | | | | | | | | | | | | | | | |
| 10 | Project | 7EP401PR | 0 | 4 | 0 | 4 | 2 | | | | | | | | | 100 | 50 | 100 | 50 | |
| | TOTAL | | 17 | 10 | 0 | 27 | **22** | | | | | **550** | | | | | | **250** | | |

Program Elective Course-IV: 1. Power System Operation & Control (7EP302PE1), 2. Smart Grid Technology(7EP302PE2), 3.Energy Audit & Management (7EP302PE3) Program Elective Course-V:

1. Power Quality & Mitigation Techniques (7EP303PE1), 2. High Voltage Engineering (7EP303PE2),3. HVDC & FACTS (7EP303PE3) Program Elective Course-VI: 1. Computer
2. Methods in Power System Analysis (7EP304PE1),2. Artificial Intelligence (7EP304PE2),3. Electric & Hybrid Vehicle(7EP304PE3)

Note:Six hours per week are allotted for continuous evaluation process for the above subjects.(Total contact hours per week=34Hours)

**Scheme for Fourth Year -Four Year UG Engineering Degree Programme**
**B. E. Electrical Engineering (Electronics & Power)**
**(Semester-VIII)**

| SN | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | | | Theory (Total) | | Practical Evaluation | | | | Practical (Total) | | ESE Time (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | External | | Internal | | | | External | | Internal | | | | |
| | | | L | P | T | Hrs. | | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | |
| | **Core Courses** | | | | | | | | | | | | | | | | | | | |
| 1 | Research Methodology | 8EP309RM | 4* | 0 | 0 | 4 | 4 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 2 | Industry Internship | 8EP402EL | 0 | 24 | 0 | 24 | 12 | | | | | | | 200 | 80 | 100 | 40 | 300 | 150 | |
| 3 | Project | 8EP403PR | 0 | 4 | 0 | 4 | 2 | | | | | | | 50 | 20 | 50 | 20 | 100 | 50 | |
| | TOTAL | | 04 | 28 | 0 | 32 | **18** | | | | | **100** | | | | | | **400** | | |

**L: Lecture P: Practical T : Tutorial ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External**

*** The course on Research Methodology is supposed to be completed by the student in Online mode**

**(Swayam, MOOC's, any other platform approved by AICTE OR on the LMS platform offered by the Institute).**

## B.E.ELECTRICAL ENGINEERING(ELECTRONICS & POWER)

### Multi-Disciplinary Minors (14Credits)

| SEM | CourseCode | CourseType | Credit | | CourseTitle |
|---|---|---|---|---|---|
| | | | T | P | |
| SemIII | 3EP205MD | MDM–I | 2 | 0 | Electrical Energy Generation |
| SemIV | 4EP214MD | MDM-II | 2 | 0 | Electrical Measurements |
| SemV | 5EP227MD | MDM-III | 2 | 0 | DC Machines |
| | 5EP228MD | MDM-IV | 2 | 0 | AC Machines |
| | 5EP229MD | MDMLab.-I | 0 | 1 | Electrical Machines Lab |
| SemVI | 6EP239MD | MDM-V | 2 | 0 | Basic Power System |
| SemVII | 7EP307MD | MDM-VI | 2 | 0 | Energy Audit & Management |
| | 7EP308MD | MDMLab.-II | 0 | 1 | Power System Lab |
| | | | **12** | **02** | |
| | | **Total** | **14** | | |

| PROGRAM ELECTIVE COURSES | | | | |
|---|---|---|---|---|
| **SEMESTER** | | **CODE** | **TITLE** | **CREDIT** |
| V | PEC I | 5EP223PE1 | Advanced Control System | 03 |
| | | 5EP223PE2 | Industrial Automation | 03 |
| | | 5EP223PE3 | Process Control System | 03 |
| VI | PEC II | 6EP234PE 1 | Electrical Energy Distribution & Utilization | 03 |
| | | 6EP234PE 2 | Electrical Distribution & Substation Automation | 03 |
| | | 6EP234PE 3 | Electrical Estimation &Costing | 03 |
| | PEC III | 6EP235PE1 | Electrical Machine Design | 03 |
| | | 6EP235PE2 | Generalized Machine Theory | 03 |
| | | 6EP235PE3 | Electrical Drives & Control | 03 |
| VII | PEC IV | 7EP302PE1 | . Power Quality & Mitigation Techniques | 03 |
| | | 7EP302PE2 | Smart Grid Technology | 03 |
| | | 7EP302PE3 | Energy Audit & Management | 03 |
| | PEC V | 7EP303PE1 | Power Quality & Mitigation Techniques | 03 |
| | | 7EP303PE2 | . High Voltage Engineering | 03 |
| | | 7EP303PE3 | HVDC & FACTS | 03 |
| | PEC VI | 7EP304PE1 | Computer Methods in Power System Analysis | 03 |
| | | 7EP304PE2 | Artificial Intelligence | 03 |
| | | 7EP304PE3 | . Electric & Hybrid Vehicle | 03 |

| OPEN ELECTIVE COURSES | | | | |
|---|---|---|---|---|
| **SEMESTER** | | **CODE** | **TITLE** | **CREDIT** |
| III | OE I | 3EP206OE1 | PowerSupply System | 03 |
| | | 3EP206OE2 | Energy Generation & Utilization | 03 |
| IV | OE II | 4EP216OE1 | Electrical Drives | 02 |
| | | 4EP216OE2 | Electrical Machines | 02 |
| V | OE III | 5EP230OE1 | Energy Audit &Management | 02 |
| | | 5EP230OE2 | Electrical Estimation &Costing | 02 |

## Multidisciplinary Double Minor (Specialization), Honors and Honors with Research in Electrical Engineering / Electrical (Electronics & Power) Engineering

1. **Double Minor (Multidisciplinary and Specialization Minor)**

Under Bachelor's Engineering / Technology Degree in chosen Major Engineering / Technology Discipline with Double Minor (Multidisciplinary and Specialization Minor, 180-194 credits), students would take up five-six additional courses of 18 credits in another Engineering / Technology discipline/ Emerging Areas Specialization distributed over semesters III to VIII.

2. **Honors Degree**

The Bachelor's Engineering / Technology Honors Degree in chosen Major Engineering / Technology Discipline with Multidisciplinary Minor (180-194 credits) enables students to take up five-six additional courses in the **same** Engineering. / Tech. discipline of 18 credits distributed over semesters III to VIII.

3. **Honors with Research**

**For BE Honors with Research in Electrical Engineering / Electrical (Electronics & Power) Engineering students needs to complete a Research Project** (on **Individual basis**) of **18 credits** in VII (7EP408HR) & VIII (EP409HR) semester**.**

***Eligibility for admission to the UG Bachelor's Degree with Double Minor/ Honors /Research as per UGC guidelines**:

Minimum CGPA/CPI of **7.5 or minimum 75%** after **second semester** for UG Bachelor's Degree with **Double Minor/Honors'** and Minimum CGPA/CPI of **7.5 or minimum 75%** after **sixth semester** for UG Bachelor's Degree with Research

**Subject Tracks for Multidisciplinary Double Minor (Specialization) and Honors in Electrical Engineering / Electrical (Electronics & Power) Engineering Track 1: E-Mobility**

| Semester | Sem III | Sem IV | Sem V | Sem VI | Sem VII |
|---|---|---|---|---|---|
| **Subject** | Electric Vehicle System and Architecture | Battery Management Systems | Vehicle Powertrain and Drive Systems | EV Charging Infrastructure and Smart Grids | Mini-project/ Industry training on EV for minimum duration of 2 weeks. |
| **Code** | 3EP245DH1 | 4EP246DH1 | 5EP247DH1 | 3EP24DH1 | 7EP407DH1 |
| **Credits** | 04 | 04 | 04 | 04 | 02 |
| **Total Credits** | 18 | | | | |

**Track 2: Power System**

| Semester | Sem III | Sem IV | Sem V | Sem VI | Sem VII |
|---|---|---|---|---|---|
| **Subject** | Power System Restructuring | Advanced DC – AC Power Conversion | Grid Integration of Renewable Energy | Economic Evaluation of Power Projects | Mini-project/ Industry training on Power system for minimum duration of 2 weeks. |
| **Code** | 3EP245DH2 | 4EP246DH2 | 5EP247DH2 | 3EP24DH2 | 7EP407DH2 |
| **Credits** | 04 | 04 | 04 | 04 | 02 |
| **Total Credits** | 18 | | | | |

## Nomenclature:

| Acronym | Course/Subject Vertical |
|---|---|
| BS | Basic Science Course |
| ES | Engineering Science Course |
| EL | Experiential Learning |
| PC | Program Course |
| PE | Program Elective Course |
| MD | Multidisciplinary Minor Course |
| OE | Open Elective |
| VS | Vocational Skill Enhancement Course |
| AE | Ability Enhancement Course |
| EM | Entrepreneurship/Economics/Management Course |
| IK | Indian Knowledge System |
| VE | Value Education Course |
| RM | Research Methodology |
| FP | Field Project |
| PR | Project |
| CC | Co-curricular Course |
| EC | Exit Course |
| HR | Honors' with Research |
| DH | Double Minor/ Honors |

**Scheme for Second Year - Four Year UG Engineering Degree Programme**
**B. E. Electrical Engineering (Semester-III)**

| SN | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | | | Theory (Total) | | Practical Evaluation | | | | Practical (Total) | | ESE Time (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | External | | Internal | | | | External | | Internal | | | | |
| | | | L | P | T | Hrs. | | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | |
| | **Core Courses** | | | | | | | | | | | | | | | | | | | |
| 1 | Electronics Components & Circuits | 3EE200PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 2 | Electrical Circuit Analysis | 3EE201PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 3 | Electrical Measurements and Instrumentation | 3EE202PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | | | | | | | | |
| 4 | Community Engagement Project/ Fieldproject (related to Major) | 3EE400EL | 0 | 4 | 0 | 4 | 2 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 5 | Electrical Circuit Analysis Lab | 3EE203PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 6 | Electrical Measurements and Instrumentation Lab | 3EE204PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Multi-Disciplinary Minor (MDM)** | | | | | | | | | | | | | | | | | | | |
| 7 | Electrical Energy Generation | 3EE205MD | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | | | | | | | | |
| 8 | Open Elective I | 3EE206OE | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| | **HSSMC (Entrepreneurship/ Economics/ Management Course)** | | | | | | | | | | | | | | | | | | | |
| 9 | Entrepreneurship Development | 3EE207EM | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | **Value Education Course (VEC)** | | | | | | | | | | | | | | | | | | | |
| 10 | Environmental Science | 3AL208VE | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **550** | | | | | | **150** | | |

Open Elective I: 1.Power Supply System (3EE206OE1), 2.Energy Generation & Utilization (3EE206OE2)

Note:Six hours per week are allotted for continuous evaluation process for the above subjects.(Total contact hours per week=34Hours)

**Scheme for Second Year - Four Year UG Engineering Degree Programme**
**B. E. Electrical Engineering**
**(Semester-IV)**

| SN | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | | | Theory (Total) | | Practical Evaluation | | | | Practical (Total) | | ESE Time (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | External | | Internal | | | | External | | Internal | | | | |
| | | | L | P | T | Hrs. | | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | |
| | **Core Courses** | | | | | | | | | | | | | | | | | | | |
| 1 | Electrical Machines – I | 4EE209PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 2 | Control System | 4EE210PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 3 | Electromagnetic Fields | 4EE211PC | 2 | 0 | 0 | 2 | 2 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | | | | | | | | |
| 4 | Electrical Machines - I lab | 4EE212PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 5 | Control System Lab | 4EE213PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Multi-Disciplinary Minor (MDM)** | | | | | | | | | | | | | | | | | | | |
| 6 | Electrical Measurements | 4EE214MD | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs |
| | **Vocational & Skill Enhancement Courses (VSEC)** | | | | | | | | | | | | | | | | | | | |
| 7 | Electrical Software Lab | 4EE215VS | 1 | 2 | 0 | 3 | 2 | | | | | | | | | 50 | 25 | 50 | 25 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | | | | | | | | |
| 8 | Open Elective II | 4EE216OE | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | **HSSMC (Entrepreneurship/ Economics/ Management Course)** | | | | | | | | | | | | | | | | | | | |
| 9 | Engineering Economics | 4EE217EM | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | **Ability Enhancement Courses (AEC)** | | | | | | | | | | | | | | | | | | | |
| 10 | Modern Indian Language | 4AL218AE | 2 | 0 | 0 | 2 | 2 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Value Education Course (VEC)** | | | | | | | | | | | | | | | | | | | |
| 11 | Universal Human Values | 4AL219VE | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | TOTAL | | 19 | 06 | 0 | 25 | **22** | | | | | **500** | | | | | | **200** | | |

Open Elective II: 1.Electrical Drives (4EE216OE1), 2.Electrical Machines (4EE216OE2)

Note:Six hours per week are allotted for continuous evaluation process for the above subjects.(Total contact hours per week=34Hours)

Scheme for Multiple Entry and Exit

| **Exit option 2 (L5.0): Award of UG Diploma in Major with 88 credits and an additional 8 credits** | | | | |
|---|---|---|---|---|
| **Exit Courses** | | | | |
| 1 | 5EE243EC | Electrical Panel Design and Implementation | Work based vocational courses/training during summer vacation.<br><br>(Minimum 4 Week/course) | **4** |
| 2 | 5EE244EC | Repairing and maintenance of Electrical Machines | | **4** |
| **OR** | | | | |
| 3 | 5EE405EL | Internship / Apprenticeship | During Summer Vacation (Minimum 8 Week) | **8** |

**Scheme for Third Year - Four Year UG Engineering Degree Programme**
**B. E. Electrical Engineering**
**(Semester-V)**

| SN | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | | | Theory (Total) | | Practical Evaluation | | | | Practical (Total) | | ESE Time (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | External | | Internal | | | | External | | Internal | | | | |
| | | | L | P | T | Hrs. | | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | |
| | **Core Courses** | | | | | | | | | | | | | | | | | | | |
| 1 | Power Electronics | 5EE221PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 2 | Electrical Machines – II | 5EE222PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 3 | Power System – I | 5EE223PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 4 | Program Elective Course – I | 5EE224PE | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | | | | | | | | |
| 5 | Power Electronics Lab | 5EE225PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 6 | Electrical Machines – II Lab | 5EE226PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 7 | Power System – I Lab | 5EE227PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Multi-Disciplinary Minor (MDM)** | | | | | | | | | | | | | | | | | | | |
| 8 | DC Machine | 5EE228MD | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| 9 | AC Machine | 5EE229MD | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| 10 | Electrical Machines Lab | 5EE230MD | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | | | | | | | | |
| 11 | Open Elective III | 5EE231OE | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **550** | | | | | | **200** | | |

Program Elective Course- I: 1. Advanced Control System (5EE224PE1) 2.Industrial Automation (5EE224PE2), 3. Process Control System (5EE224PE3) Open Elective III: 1.Energy Audit & Management (5EE231OE1), 2.Electrical Estimation &Costing (5EE231OE2)

Note:Six hours per week are allotted for continuous evaluation process for the above subjects.(Total contact hours per week=34Hours)

**Scheme for Third Year - Four Year UG Engineering Degree Programme**
**B. E. Electrical Engineering**
**(Semester-VI)**

| SN | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | | | Theory (Total) | | Practical Evaluation | | | | Practical (Total) | | ESE Time (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | External | | Internal | | | | External | | Internal | | | | |
| | | | L | P | T | Hrs. | | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | |
| | **Core Courses** | | | | | | | | | | | | | | | | | | | |
| 1 | Computer Aided Machine Design | 6EE232PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 2 | Microprocessor & Microcontroller | 6EE233PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 3 | Power System – II | 6EE234PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 4 | Program Elective Course-II | 6EE235PE | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 5 | Program Elective Course-III | 6EE236PE | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | | | | | | | | |
| 6 | Computer Aided Machine Design Lab | 6EE237PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 7 | Microprocessor & Microcontroller Lab | 6EE238PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 8 | Power System – II Lab | 6EE239PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Multi-Disciplinary Minor (MDM)** | | | | | | | | | | | | | | | | | | | |
| 9 | Basic Power System | 6EE240MD | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | **Vocational and Skill Enhancement Courses** | | | | | | | | | | | | | | | | | | | |
| 10 | PLC & Industrial Automation Lab | 6EE241VS | 1 | 2 | 0 | 3 | 2 | | | | | | | | | 50 | 25 | 50 | 25 | |
| | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **550** | | | | | | **200** | | |

**Program Elective Course-II: 1. Electrical Energy Distribution & Utilization (6EE234PE1), 2. Electrical Distribution & Substation Automation (6EE234PE2) ,3. Electrical Estimation &Costing (6EE234PE3) Program Elective Course-III: 1.Numerical Methods & Optimization Techniques (6EE235PE1), 2. Generalized Machine Theory (6EE235PE2),3.Electrical Drives & Control (6EE235PE3)**

Note:Six hours per week are allotted for continuous evaluation process for the above subjects.(Total contact hours per week=34Hours)

Scheme for Multiple Entry and Exit

| **Exit option 3 (L5.5): Award of UG Degree in Major with 132 credits and an additional 8 credits** | | | | |
|---|---|---|---|---|
| **Exit Courses** | | | | |
| 1 | 7EE310EC | Industrial Electrical systems installation and maintenance | Work based vocational courses/training during summer vacation.<br><br>(Minimum 4 Week/course) | **4** |
| 2 | 7EE311EC | PCB Design and Circuit Simulation | | **4** |
| **OR** | | | | |
| 3 | 7EE406EL | Internship / Apprenticeship | During Summer vacation (Minimum 8 week) | **8** |

**Scheme for Fourth Year - Four Year UG Engineering Degree Programme**
**B. E. Electrical Engineering**
**(Semester-VII)**

| SN | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | | | Theory (Total) | | Practical Evaluation | | | | Practical (Total) | | ESE Time (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | External | | Internal | | | | External | | Internal | | | | |
| | | | L | P | T | Hrs. | | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | |
| | **Core Courses** | | | | | | | | | | | | | | | | | | | |
| 1 | Power System Protection | 7EE300PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 2 | Digital Signal Processing | 7EE301PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 3 | Program Elective Course-IV | 7EE302PE | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 4 | Program Elective Course-V | 7EE303PE | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 5 | Program Elective Course-VI | 7EE304PE | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | | | | | | | | |
| 6 | Power System Protection lab | 7EE305PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 7 | Digital Signal Processing lab | 7EE306PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Multi-Disciplinary Minor (MDM)** | | | | | | | | | | | | | | | | | | | |
| 8 | Energy Audit & Management | 7EE307MD | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| 9 | Power System Lab | 7EE308MD | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Project** | | | | | | | | | | | | | | | | | | | |
| 10 | Project | 7EE401PR | 0 | 4 | 0 | 4 | 2 | | | | | | | | | 100 | 50 | 100 | 50 | |
| | TOTAL | | 17 | 10 | 0 | 27 | **22** | | | | | **550** | | | | | | **250** | | |

Program Elective Course-IV: 1. Power System Operation & Control (7EE302PE1),2. Smart Grid Technology (7EE302PE2),3. Energy Audit & Management (7EE302PE3) Program Elective Course-V: 1. Power Quality & Mitigation Techniques (7EE303PE1), 2. High Voltage Engineering (7EE303PE2),3. HVDC & FACTS (7EE303PE3) Program Elective Course-VI: 1.Computer Methods in Power System Analysis (7EE304PE1),2. Artificial Intelligence (7EE304PE2),3. Electric & Hybrid Vehicle (7EE304PE3)

Note:Six hours per week are allotted for continuous evaluation process for the above subjects.(Total contact hours per week=34Hours)

**Scheme for Fourth Year - Four Year UG Engineering Degree Programme**
**B. E. Electrical Engineering**
**(Semester-VIII)**

| SN | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | | | Theory (Total) | | Practical Evaluation | | | | Practical (Total) | | ESE Time (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | External | | Internal | | | | External | | Internal | | | | |
| | | | L | P | T | Hrs. | | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | |
| | **Core Courses** | | | | | | | | | | | | | | | | | | | |
| 1 | Research Methodology | 8EE309RM | 4* | 0 | 0 | 4 | 4 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 2 | Industry Internship | 8EE402EL | 0 | 24 | 0 | 24 | 12 | | | | | | | 200 | 80 | 100 | 40 | 300 | 150 | |
| 3 | Project | 8EE403PR | 0 | 4 | 0 | 4 | 2 | | | | | | | 50 | 20 | 50 | 20 | 100 | 50 | |
| | TOTAL | | 04 | 28 | 0 | 32 | **18** | | | | | **100** | | | | | | **400** | | |

**L: Lecture P: Practical T : Tutorial ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External**

*** The course on Research Methodology is supposed to be completed by the student in Online mode**

**(Swayam, MOOC's, any other platform approved by AICTE OR on the LMS platform offered by the Institute).**

## B.E.ELECTRICAL ENGINEERING

### Multi-Disciplinary Minors (14Credits)

| SEM | CourseCode | CourseType | Credit | | CourseTitle |
|---|---|---|---|---|---|
| | | | T | P | |
| Sem III | 3EE205MD | MDM–I | 2 | 0 | Electrical Energy Generation |
| Sem IV | 4EE214MD | MDM-II | 2 | 0 | Electrical Measurements |
| Sem V | 5EE227MD | MDM-III | 2 | 0 | DC Machines |
| | 5EE228MD | MDM-IV | 2 | 0 | AC Machines |
| | 5EE229MD | MDM Lab.-I | 0 | 1 | Electrical Machines Lab |
| Sem VI | 6EE239MD | MDM-V | 2 | 0 | Basic Power System |
| Sem VII | 7EE307MD | MDM-VI | 2 | 0 | Energy Audit & Management |
| | 7EE308MD | MDM Lab.-II | 0 | 1 | Power System Lab |
| | | | **12** | **02** | |
| | | **Total** | **14** | | |

| PROGRAM ELECTIVE COURSE | | | | |
|---|---|---|---|---|
| SEMESTER | | CODE | TITLE | CREDIT |
| V | PEC I | 5EE223PE1 | Advanced Control System | 03 |
| | | 5EE223PE2 | Industrial Automation | 03 |
| | | 5EE223PE3 | Process Control System | 03 |
| VI | PEC II | 6EE234PE 1 | Electrical Energy Distribution & Utilization | 03 |
| | | 6EE234PE 2 | Electrical Distribution & Substation Automation | 03 |
| | | 6EE234PE 3 | Electrical Estimation &Costing | 03 |
| | PEC III | 6EE235PE1 | Electrical Machine Design | 03 |
| | | 6EE235PE2 | Generalized Machine Theory | 03 |
| | | 6EE235PE3 | Electrical Drives & Control | 03 |
| VII | PEC IV | 7EE302PE1 | . Power Quality & Mitigation Techniques | 03 |
| | | 7EE302PE2 | Smart Grid Technology | 03 |
| | | 7EE302PE3 | Energy Audit & Management | 03 |
| | PEC V | 7EE303PE1 | Power Quality & Mitigation Techniques | 03 |
| | | 7EE303PE2 | High Voltage Engineering | 03 |
| | | 7EE303PE3 | HVDC & FACTS | 03 |
| | PEC VI | 7EE304PE1 | Computer Methods in Power System Analysis | 03 |
| | | 7EE304PE2 | Artificial Intelligence | 03 |
| | | 7EE304PE3 | Electric & Hybrid Vehicle | 03 |

| OPEN ELECTIVE COURSE | | | | |
|---|---|---|---|---|
| SEMESTER | | CODE | TITLE | CREDIT |
| III | OE I | 3EE206OE1 | PowerSupply System | 03 |
| | | 3EE206OE2 | Energy Generation & Utilization | 03 |
| IV | OE II | 4EE216OE1 | Electrical Drives | 02 |
| | | 4EE216OE2 | Electrical Machines | 02 |
| V | OE III | 5EE230OE1 | Energy Audit &Management | 02 |
| | | 5EE230OE2 | Electrical Estimation &Costing | 02 |

## Multidisciplinary Double Minor (Specialization), Honors and Honors with Research in Electrical Engineering / Electrical (Electronics & Power) Engineering

1. **Double Minor (Multidisciplinary and Specialization Minor)**

Under Bachelor's Engineering / Technology Degree in chosen Major Engineering / Technology Discipline with Double Minor (Multidisciplinary and Specialization Minor, 180-194 credits), students would take up five-six additional courses of 18 credits in another Engineering / Technology discipline/ Emerging Areas Specialization distributed over semesters III to VIII.

2. **Honors Degree**

The Bachelor's Engineering / Technology Honors Degree in chosen Major Engineering / Technology Discipline with Multidisciplinary Minor (180-194 credits) enables students to take up five-six additional courses in the **same** Engineering. / Tech. discipline of 18 credits distributed over semesters III to VIII.

3. **Honors with Research**

For BE Honors with Research in Electrical Engineering / Electrical (Electronics & Power) Engineering students needs to complete a **Research Project** (on **Individual basis**) of **18 credits** in VII (7EP408HR) & VIII (EP409HR) semester**.**

***Eligibility for admission to the UG Bachelor's Degree with Double Minor/ Honors /Research as per UGC guidelines**:

Minimum CGPA/CPI of **7.5 or minimum 75%** after **second semester** for UG Bachelor's Degree with **Double Minor/Honors'** and Minimum CGPA/CPI of **7.5 or minimum 75%** after **sixth semester** for UG Bachelor's Degree with Research

**Subject Tracks for Multidisciplinary Double Minor (Specialization) and Honors in Electrical Engineering / Electrical (Electronics & Power) Engineering Track 1: E-Mobility**

| Semester | Sem III | Sem IV | Sem V | Sem VI | Sem VII |
|---|---|---|---|---|---|
| **Subject** | Electric Vehicle System and Architecture | Battery Management Systems | Vehicle Powertrain and Drive Systems | EV Charging Infrastructure and Smart Grids | Mini-project/ Industry training on EV for minimum duration of 2 weeks. |
| **Code** | 3EE245DH1 | 4EE246DH1 | 5EE247DH1 | 3EE24DH1 | 7EE407DH1 |
| **Credits** | 04 | 04 | 04 | 04 | 02 |
| **Total Credits** | 18 | | | | |

**Track 2: Power System**

| Semester | Sem III | Sem IV | Sem V | Sem VI | Sem VII |
|---|---|---|---|---|---|
| **Subject** | Power System Restructuring | Advanced DC – AC Power Conversion | Grid Integration of Renewable Energy | Economic Evaluation of Power Projects | Mini-project/ Industry training on Power system for minimum duration of 2 weeks. |
| **Code** | 3EE245DH2 | 4EE246DH2 | 5EE247DH2 | 3EE24DH2 | 7EE407DH2 |
| **Credits** | 04 | 04 | 04 | 04 | 02 |
| **Total Credits** | 18 | | | | |

## Nomenclature:

| Acronym | Course/Subject Vertical |
|---|---|
| BS | Basic Science Course |
| ES | Engineering Science Course |
| EL | Experiential Learning |
| PC | Program Course |
| PE | Program Elective Course |
| MD | Multidisciplinary Minor Course |
| OE | Open Elective |
| VS | Vocational Skill Enhancement Course |
| AE | Ability Enhancement Course |
| EM | Entrepreneurship/Economics/Management Course |
| IK | Indian Knowledge System |
| VE | Value Education Course |
| RM | Research Methodology |
| FP | Field Project |
| PR | Project |
| CC | Co-curricular Course |
| EC | Exit Course |
| HR | Honors' with Research |
| DH | Double Minor/ Honors |

**Scheme for Second Year -Four Year UG Engineering Degree Programme**
**B.TEXT.E. (Bachelor of Textile Engineering) (Semester-III)**

| SN | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | | | Theory (Total) | | Practical Evaluation | | | | Practical (Total) | | ESE Time (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | External | | Internal | | | | External | | Internal | | | | |
| | | | L | P | T | Hrs. | | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | |
| | **Core Courses** | | | | | | | | | | | | | | | | | | | |
| 1 | Textile Fibre - I | 3TX200PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 2 | Yarn Manufacturing -I | 3TX201PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 3 | Textile Testing and Quality control | 3TX202PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | | | | | | | | |
| 4 | Comm. Engagement Project/ Field Project | 3TX400EL | 0 | 4 | 0 | 4 | 2 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 5 | Yarn Manufacturing –I Lab | 3TX203PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 6 | Textile Testing and Quality Control Lab | 3TX204PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Multi-Disciplinary Minor (MDM)** | | | | | | | | | | | | | | | | | | | |
| 7 | Multidisciplinary Minor –I* | 3TX205MD | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | | | | | | | | |
| 8 | Open Elective I | 3TX206OE 1/2 | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| | **HSSMC (Entrepreneurship/ Economics/ Management Course)** | | | | | | | | | | | | | | | | | | | |
| 9 | Elements of Costing & Economics | 3TX207EM | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | **Value Education Course (VEC)** | | | | | | | | | | | | | | | | | | | |
| 10 | Environmental Science | 3AL208VE | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | **TOTAL** | | **18** | **08** | **0** | **26** | **22** | | | | | **550** | | | | | | **150** | | |

L: Lecture P: Practical T: Tutorial MSE: Mid Semester Exam SE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External

**Note:** Suitable number of hours per week is allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

Open Elective-I: 1) Principles of Fashion Technology (3TX206OE1) 2) Computer aided Textile Designing (3TX206OE2)

*Please refer to the list of Multidisciplinary Minor courses attached separately.

**Scheme for Second Year - Four Year UG Engineering Degree Programme B.TEXT.E. (Bachelor of Textile Engineering) (Semester-IV)**

| SN | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | | | Theory (Total) | | Practical Evaluation | | | | Practical (Total) | | ESE Time (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | External | | Internal | | | | External | | Internal | | | | |
| | | | L | P | T | Hrs. | | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | |
| | **Core Courses** | | | | | | | | | | | | | | | | | | | |
| 1 | Textile Fiber-II | 4TX209PC | 2 | 0 | 0 | 2 | 2 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 2 | Yarn Manufacturing –II | 4TX210PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 3 | Fabric Manufacturing -I | 4TX211PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | | | | | | | | |
| 4 | Yarn Manufacturing –II Lab | 4TX212PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 5 | Fabric Manufacturing – I Lab | 4TX213PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Multi-Disciplinary Minor (MDM)** | | | | | | | | | | | | | | | | | | | |
| 6 | Multidisciplinary Minor –II* | 4TX214MD | 1 | 2 | 0 | 3 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs |
| | **Vocational & Skill Enhancement Courses (VSEC)** | | | | | | | | | | | | | | | | | | | |
| 7 | Textile Testing and Evaluation-1 | 4TX215VS | 1 | 2 | 0 | 3 | 2 | | | | | | | | | 50 | 25 | 50 | 25 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | | | | | | | | |
| 8 | Open Elective- II | 4TX216OE 1/2 | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | **HSSMC (Entrepreneurship/ Economics/ Management Course)** | | | | | | | | | | | | | | | | | | | |
| 9 | Principles of Management | 4TX217EM | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | **Ability Enhancement Courses (AEC)** | | | | | | | | | | | | | | | | | | | |
| 10 | Modern Indian Language | 4AL218AE | 2 | 0 | 0 | 2 | 2 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Value Education Course (VEC)** | | | | | | | | | | | | | | | | | | | |
| 11 | Universal Human Values | 4AL219VE | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | **TOTAL** | | **18** | **08** | **0** | **26** | **22** | | | | | **500** | | | | | | **200** | | |

L: Lecture P: Practical T: Tutorial MSE: Mid Semester Exam ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External

**Note:** Suitable number of hours per week is allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

**Open Elective-II: 1) Garment Manufacturing and Pattern Designing (4TX216OE 1), 2) Textile Waste management (4TX216OE 2)**

***Please refer list of Multidisciplinary Minor courses attached separately.**

Scheme for Multiple Entry and Exit

| Exit option -2 (Level 5.0): Award of UG Diploma in Major with 88 credits and an additional 8 credits | | | | |
|---|---|---|---|---|
| **Exit Courses** | | | | |
| 1 | Chemical Processing of Textile Material | 5TX243EC | Online Certification Course | 4 |
| 2 | Modern Yarn and Fabric Manufacturing Technology | 5TX244EC | Online Certification Course | 4 |
| | **OR** | | | |
| 3 | Internship in Textile or Garment Industry in Production, Designing and Quality Control Departments | 5TX405EL | Two Months (288 – 320 Hours) | 8 |

**Scheme for Third Year - Four Year UG Engineering Degree Programme**
**B.TEXT.E. (Bachelor of Textile Engineering) (Semester-V)**

| SN | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | | | Theory (Total) | | Practical Evaluation | | | | Practical (Total) | | ESE Time (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | External | | Internal | | | | External | | Internal | | | | |
| | | | L | P | T | Hrs. | | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | |
| | **Core Courses** | | | | | | | | | | | | | | | | | | | |
| 1 | Fabric Manufacturing -II | 5TX220PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 2 | Advanced Yarn Manufacturing Technology | 5TX221PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 3 | Chemical Processing -I | 5TX222PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 4 | Program Elective Course-I | 5TX223PE | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | | | | | | | | |
| 5 | Fabric Manufacturing-II Lab | 5TX224PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 6 | Advanced Yarn Manufacturing Technology Lab | 5TX225PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 7 | Chemical Processing –I Lab | 5TX226PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Multi-Disciplinary Minor (MDM)** | | | | | | | | | | | | | | | | | | | |
| 8 | Multidisciplinary Minor –III* | 5TX227MD | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| 9 | Multidisciplinary Minor –IV* | 5TX228MD | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| 10 | Multidisciplinary Minor Lab – I* | 5TX229ML | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | | | | | | | | |
| 11 | Open Elective- III | 5TX230OE 1/2 | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | **TOTAL** | | **18** | **08** | **0** | **26** | **22** | | | | | **550** | | | | | | **200** | | |

L: Lecture P: Practical T: Tutorial MSE: Mid Semester Exam ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External

**Note:** Suitable number of hours per week is allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

| **PEC** | **Apparel Technology (A)** | **Advance Textile Materials (B)** |
|---|---|---|
| PEC **-I** | Apparel Manufacturing | High Performance Fibres |

**Open Elective –III: 1)** Fashion Management and Marketing (5TX230OE 1), 2) Textile reinforcement for composites (5TX230OE 2)

*Please refer list of Multidisciplinary Minor courses attached separately.

**Scheme for Third Year -Four Year UG Engineering Degree Programme**
**B.TEXT.E. (Bachelor of Textile Engineering) (Semester-VI)**

| SN | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | | | Theory (Total) | | Practical Evaluation | | | | Practical (Total) | | ESE Time (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | External | | Internal | | | | External | | Internal | | | | |
| | | | L | P | T | Hrs. | | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | |
| | **Core Courses** | | | | | | | | | | | | | | | | | | | |
| 1 | Process Control in Textile Manufacturing | 6TX231PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 2 | Advanced Fabric Manufacturing Technology | 6TX232PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 3 | Chemical Processing -II | 6TX233PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 4 | Program Elective Course-II | 6TX234PE | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 5 | Program Elective Course -III | 6TX235PE | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | | | | | | | | |
| 6 | Process Control in Textile Manufacturing- (Case Studies) - Lab | 6TX236PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 7 | Advanced Fabric Manufacturing Technology Lab | 6TX237PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 8 | Chemical Processing –II Lab | 6TX238PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Multi-Disciplinary Minor (MDM)** | | | | | | | | | | | | | | | | | | | |
| 9 | Multidisciplinary Minor –V* | 6TX239MD | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| | **Vocational and Skill Enhancement Courses** | | | | | | | | | | | | | | | | | | | |
| 10 | Textile Testing and Evaluation-II | 6TX240VS | 1 | 2 | 0 | 3 | 2 | | | | | | | | | 50 | 25 | 50 | 25 | |
| | **TOTAL** | | **18** | **08** | **0** | **26** | **22** | | | | | **550** | | | | | | **200** | | |

L: Lecture P: Practical T: Tutorial ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External

**Note:** Suitable number of hours per week is allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours) Please refer list of Multidisciplinary Minor courses attached separately.

| PEC | Apparel Technology (A) | Advance Textile Materials (B) |
|---|---|---|
| PEC **-II** | Apparel Merchandising | Textured Yarn Technology |
| PEC **-III** | Sustainability and Certifications for Textile and Apparel Industry | Technical Textiles |

## Scheme for Multiple Entry and Exit

| **Exit option -3 (Level 5.5): Award of UG Degree in Major with 132 credits and an additional 8 credits** | | | | |
|---|---|---|---|---|
| **Exit Courses** | | | | |
| 1 | Knitting Technology | 6TX310EC | Online Certification Course | 4 |
| 2 | Technical Textiles | 6TX311EC | Online Certification Course | 4 |
| | **OR** | | | |
| 3 | Internship in Textile or Garment Industry in Production, Designing and Quality Control Departments | 6TX406EL | Two Months (288 -320 Hours) | 8 |

**Scheme for Fourth Year - Four Year UG Engineering Degree Programme**
**B.TEXT.E. (Bachelor of Textile Engineering)**
**(Semester-VII)**

| SN | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | | | Theory (Total) | | Practical Evaluation | | | | Practical (Total) | | ESE Time (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | External | | Internal | | | | External | | Internal | | | | |
| | | | L | P | T | Hrs. | | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | |
| | **Core Courses** | | | | | | | | | | | | | | | | | | | |
| 1 | Knitting Technology | 7TX300PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 2 | Textile Mathematics | 7TX301PC | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 3 | Program Elective Course-IV | 7TX302PE | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 4 | Program Elective Course-V | 7TX303PE | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 5 | Program Elective Course-VI | 7TX304PE | 3 | 0 | 0 | 3 | 3 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | | | | | | | | |
| 6 | Knitting Technology Lab | 7TX305PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| 7 | Textile Fiber Lab | 7TX306PC | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Multi-Disciplinary Minor (MDM)** | | | | | | | | | | | | | | | | | | | |
| 8 | Multidisciplinary Minor –VI* | 7TX307MD | 2 | 0 | 0 | 2 | 2 | 30 | 09 | 20 | 06 | 50 | 20 | | | | | | | 2.00 Hrs. |
| 9 | Multidisciplinary Minor Lab –I I* | 7TX308ML | 0 | 2 | 0 | 2 | 1 | | | | | | | 25 | 10 | 25 | 10 | 50 | 25 | |
| | **Project** | | | | | | | | | | | | | | | | | | | |
| 10 | Project | 7EP401PR | 0 | 4 | 0 | 4 | 2 | | | | | | | | | 100 | 50 | 100 | 50 | |
| | **TOTAL** | | **17** | **10** | **0** | **27** | **22** | | | | | **550** | | | | | | **250** | | |

L: Lecture P: Practical T: Tutorial ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External

**Note:** Suitable number of hours per week is allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours

| **PEC** | **Apparel Technology (A)** | **Advance Textile Materials (B)** |
|---|---|---|
| PEC **–IV** | Comfort and Clothing Science | Nonwoven Technology |
| PEC **-V** | Supply chain Management in Textile and Apparel Industry | Textile Composites |
| PEC **-VI** | ERP and MIS in Textile and Apparel Industry | Nanotechnology in Textiles |

**Scheme for Fourth Year -Four Year UG Engineering Degree Programme**
**B.TEXT.E. (Bachelor of Textile Engineering)**
**(Semester-VIII)**

| SN | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | | | Theory (Total) | | Practical Evaluation | | | | Practical (Total) | | ESE Time (Hours) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | External | | Internal | | | | External | | Internal | | | | |
| | | | L | P | T | Hrs. | | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | Max Marks | Min Marks | |
| | **Core Courses** | | | | | | | | | | | | | | | | | | | |
| 1 | Research Methodology | 8TX309RM | 4* | 0 | 0 | 4 | 4 | 60 | 18 | 40 | 12 | 100 | 40 | | | | | | | 3.00 Hrs. |
| 2 | Industry Internship | 8TX402EL | 0 | 24 | 0 | 24 | 12 | | | | | | | 200 | 80 | 100 | 40 | 300 | 150 | |
| 3 | Project | 8TX403PR | 0 | 4 | 0 | 4 | 2 | | | | | | | 50 | 20 | 50 | 20 | 100 | 50 | |
| | **TOTAL** | | **04** | **28** | **0** | **32** | **18** | | | | | **100** | | | | | | **400** | | |

L: Lecture P: Practical T: Tutorial ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External

**Note:** Suitable number of hours per week is allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 42 Hours)

*The course on Research Methodology may be completed by the student in Online mode (Swayam, MOOC's, any other platform approved by AICTE OR on the LMS platform offered by the Institute).

**B.TEXT.E. (Bachelor of Textile Engineering)**

## Multi-Disciplinary Minors (14 Credits)

| SEM | Course Code | Course Type | Credit | | Course Title |
|---|---|---|---|---|---|
| | | | T | P | |
| Sem III | 3TX205MD | MDM –I | 2 | 0 | Fashion Designing |
| Sem IV | 4TX214MD | MDM -II | 2 | 0 | Garment Pattern Design |
| Sem V | 5TX227MD | MDM -III | 2 | 0 | Garment Manufacturing Technology |
| | 5TX228MD | MDM -IV | 2 | 0 | Apparel Merchandising and Management |
| | 5TX229ML | MDM Lab. -I | 0 | 1 | Garment Manufacturing Technology Lab |
| Sem VI | 6TX239MD | MDM -V | 2 | 0 | Fashion Forecasting and Visual Merchandising |
| Sem VII | 7TX307MD | MDM -VI | 2 | 0 | Sustainable Fashion and Brand Management |
| | 7TX308ML | MDM Lab. -II | 0 | 1 | Sustainable Fashion and Brand Management ( Case study) Lab. |
| | | **Total** | **12** | **02** | |

**Note:** Students from program other than Textile Engineering may opt for the above-mentioned Multidisciplinary (MDM) courses between the 3rd and 8th semesters. Completion of **14credits** is required to fulfill the requirements for the Multidisciplinary Minor degree.

**List of Courses for Honors /Double Minor Smart Textiles & Wearable Technologies**

| Sr. No. | Code | Course Type | Proposed in Semester | Credit | Title of Course |
|---|---|---|---|---|---|
| 1 | 3TX245DH1 | MDDM-I | **3** | **4** | Introduction to Smart Textiles |
| 2 | 4TX246DH1 | MDDM-II | **4** | 4 | Textile Sensors and Actuators |
| 3 | 5TX247DH1 | MDDM-III | **5** | 4 | E-Textiles and Wearable Devices |
| 4 | 6TX248DH1 | MDDM-IV | **6** | 4 | Advanced Materials for Smart Textiles |
| 5 | 7TX407DH1 | MDDM-V | **7** | 2 | Minor project |
| | **Total** | | | **18** | |

**OR**

**List of Courses for Honors /Double Minor Technical Textiles & Composites**

| Sr. No. | Code | Course Type | Proposed in Semester | Credit Th | Title of Course |
|---|---|---|---|---|---|
| 1 | 3TX245DH2 | MDDM-I | **3** | **4** | Introduction to Technical Textiles |
| 2 | 4TX246DH2 | MDDM-II | **4** | 4 | High Performance Fibers |
| 3 | 5TX247DH2 | MDDM-III | **5** | 4 | Textile Reinforced Composites |
| 4 | 6TX248DH2 | MDDM-IV | **6** | 4 | Textile Testing for Technical Use |
| 5 | 7TX407DH2 | MDDM-V | **7** | 2 | Minor project |
| | **Total** | | | **18** | |

**Note: E**ligible students may pursue a **Double Minor degree** by undertaking **Multidisciplinary and Specialization Minor courses** offered between the **3rd and 7th semesters**, subject to the institute norms and policy. Students may complete these requirements through institute-offered courses or by enrolling in approved **MOOCs via SWAYAM/NPTEL**, ensuring fulfillment of the required 18 **credits and academic standards** for the Double Minor degree.

**Bachelor of Textile Engineering with Honors Degree by Research**

| Semester | Subject | Course Code | Credits | Activities |
|---|---|---|---|---|
| 7th Sem | Research Pejecot-1 | 7TX408HR | 8 | **Initiation Phase**<br>1. Topic finalization & guide allocation<br>2. Literature survey & problem identification<br>3. Objective setting & methodology planning<br>4. Project proposal preparation & presentation<br>5. Initial experimentation/design trials<br>6. Mid-term progress report submission<br>7. Interim review presentation<br>8. End-semester report submission & evaluation |
| 8th Sem | Research Pejecot-1 | 8TX409HR | 10 | **Execution & Completion Phase**<br>1. Continuation of experimental work/data collection<br>2. Analysis, validation, and interpretation of results<br>3. Prototype/sample development (if applicable)<br>4. Preparation of full project report<br>5. Drafting & submission of research paper to Scopus/peer-reviewed journal<br>6. Pre-final internal review<br>7. Final viva-voce & presentation<br>8. Submission of final report and supporting documents |

Final-year **Textile engineering** students may opt to undertake a **Research Project** carrying **18 credits** during the **7th and 8th semesters.**

The research project shall be conducted **over two consecutive semesters** (Semester VII and Semester VIII), under the guidance of a faculty supervisor.

The project work must include:

1. A **comprehensive dissertation**,
2. **Periodic progress evaluations**, and
3. A **final viva-voce examination** conducted by an internal and/or external review panel.

The topic selected should align with the current academic and research priorities in the field of **Textile Engineering**, and must comply with the **academic and ethical standards** set by the institute or affiliating university. Successful completion of the research project, including all evaluations and submission of the final dissertation, is **mandatory** for the award of project credits and degree.

**Nomenclature: Name of Discipline /Department offering the courses**

| Acronym | Course/Subject Vertical |
|---|---|
| BS | Basic Science Course |
| BL | Basic Science Laboratory |
| ES | Engineering Science Course |
| EL | Engineering Science Laboratory |
| PC | Program Course |
| PL | Program Laboratory |
| E | Program Elective Course |
| M | Multidisciplinary Minor Course |
| ML | Multidisciplinary Minor Laboratory |
| OE | Open Elective |

| Acronym | Course/Subject Vertical |
|---|---|
| VS | Vocational Skill Enhancement Course |
| AE | Ability Enhancement Course |
| EM | Entrepreneurship/Economics/ Management Course |
| IK | Indian Knowledge System |
| VE | Value Education Course |
| RM | Research Methodology |
| FP | Field Project |
| II | Industry Internship |
| PR | Project |
| CC | Co-curricular Course |

| Acronym | Discipline of Engineering / Department offering the course |
|---|---|
| SH | Science and Humanities |
| ME | Mechanical Engineering |
| EE | Electrical Engineering |
| CS | Computer Science and Engineering |
| CE | Civil Engineering |
| IT | Information Technology |
| ET | Electronics & Telecommunication Engg. |
| TX | Textile Engineering |
| EP | Electrical (Electronics & Power) Engg. |
| AD | Artificial Engineering and Data Science |
| CH | Chemical Engineering |
| DS | CSE (Data Science) |

| | Scheme for Second Year Four Year Undergraduate Engineering Degree Programme<br>B.Tech. in (Chemical Engineering/ Chemical Technology) (Semester -III) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sr No.** | **Course Name** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total** | **ESE Time Hrs.)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Programme Core Course -I<br>Chemical Engg. Thermodynamics | 3CH200PC/<br>3CT200PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Programme Core Course –II<br>Process Instrumentation | 3CH201PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Programme Core Course –III<br>Chemical Engineering Analysis | 3CH202PC/<br>3CT202PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 4 | Community Engg. Project / Field Project | 3CH400EL | 0 | 4 | 0 | 4 | 2 | | | 25 | 25 | 50 | |
| 5 | Programme Core Course –II<br>Process Instrumentation Lab. | 3CH203PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 6 | Programme Core Course –III<br>Chemical Engineering Analysis Lab. | 3CH204PC/<br>3CT204PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 7 | Multidisciplinary Minor –<br>I Environmental Pollution:<br>Policies and Regulations | 3CH205M | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00 Hrs. |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 8 | Open Elective –I<br>De Carbonization Technologies | 3CH206OE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3 Hrs. |
| | **HSSMC (Entrepreneurship/ Economics/ Management Course)** | | | | | | | | | | | | |
| 9 | Entrepreneurship Development<br>Engineering Economics | 3CH207EM/<br>3CT207EM | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00 Hrs. |
| | **Value Education Course (VEC)** | | | | | | | | | | | | |
| 10 | Environmental Science<br>Environmental Studies | 3CH208VE/<br>3CT208VE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **700** | |

**L: Lecture** **P: Practical** **T: Tutorial** **MSE: Mid Semester Exam** **ESE: End Semester Exam** **IE: Internal Evaluation** **INT: Internal** **EXT: External**

| | **Scheme for Second Year Four Year Undergraduate Engineering Degree Programme**<br>**B.Tech. in (Chemical Engineering/ Chemical Technology).**<br>**(Semester -IV) Level- 5.0** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sr No.** | **Course Name** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total** | **ESE Time Hrs.)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Programme Core Course –I<br>Fluid Flow Operation | 4CH209PC/<br>4CT209PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Programme Core Course-II (Chemical Engg. Operation – I)<br>Mechanical Operation | 4CH210PC/<br>4CT210PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Programme Core Course-III Process Calculation | 4CH211PC | 2 | 0 | 0 | 2 | 2 | 40 | 60 | | | 100 | 3 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 4 | Programme Core Course –I<br>Fluid Flow Operation Lab. | 4CH212PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 5 | Programme Core Course –II (Chemical Engg. Operation – I Lab.)<br>Mechanical Operation Lab. | 4CH213PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 6 | Multidisciplinary Minor –II<br>Chemical Engineering in Air Pollution and Control | 4CH214M | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00 Hrs. |
| | **Vocational and Skill Enhancement Courses (VSEC-III)** | | | | | | | | | | | | |
| 7 | VSEC-III<br>Machine Design & Drawing | 4CH215VS/<br>4CT216VS | 1 | 2 | 0 | 3 | 2 | | | 50 | - | 50 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 8 | Open Elective- II<br>Water Treatment Technologies | 4CH216OE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | **HSSMC (Entrepreneurship/ Economics/ Management Course)** | | | | | | | | | | | | |
| 9 | Management Related /Engg. Economics<br>Industrial Management | 4CH217EM/<br>4CT218EM | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | **(Ability Enhancement Course (AEC)** | | | | | | | | | | | | |
| 10 | Modern Indian Language Technical English | 4CH218AE | 2 | 0 | 0 | 2 | 2 | | | 25 | 25 | 50 | . |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Value Education Course (VEC)** | | | | | | | | | | | | |
| 11 | Environmental Science / UHV /VE Human Values & Professional Ethics | 4CH219VE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | TOTAL | | 19 | 06 | 0 | 25 | **22** | | | | | **700** | |

**L: LectureP: Practical T: Tutorial MSE: Mid Semester Exam ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External**

## Scheme for Multiple Entry and Exit

| **Exit option -2 (L6): Award of UG Diploma in Major with 88 credits and an additional 8 credits** | | | |
|---|---|---|---|
| **Exit Courses** | | | |
| 1 | Fluidization Engineering | **Online/offline certification Course by SWAYAM, MOOC, NPTEL or any Government registered organization** | **8** |
| 2 | Fluid Flow Operations | | **8** |
| 3 | Chemical Process Utilities | | **8** |
| 4 | Physico-chemical Processes For Wastewater Treatment | | **8** |
| 5 | Fuels Engineering | | **8** |
| 6 | Two month Internship in Chemical Analysis Lab., at Chemical Industry in Production, Waste Treatment or Designing. | | **8** |

(Board of Studies in each subject is expected to specify different courses (combined of total 08 credits for the award of UG Diploma related with the major of respective discipline.)

# Students can opt any one of these courses and submit the valid certificates to exit the programme.

| | Scheme for Third Year Four Year Undergraduate Engineering Degree Programme<br>B.Tech. in (Chemical Engineering/ Chemical Technology).<br>(Semester -V) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sr No.** | **Course Name** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total** | **ESE Time Hrs.)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Programme Core Course –<br>I Heat Transfer | 5CH220PC/<br>5CT220PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Programme Core Course-II<br>Industrial Waste Treatment | 5CH221PC/<br>5CT221PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Programme Core Course-III<br>Computer Programming & Application | 5CH222PC/<br>5CT223PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 4 | Programme Elective Course –I<br>Inorganic Chemical Technology<br>Biochemical Engineering<br>Material Science & Engineering | <br>5CH223PE<br>5CH224PE<br>5CH225PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 5 | Programme Core Course –I<br>Heat Transfer Lab. | 5CH226PC/<br>5CT224PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 6 | Programme Core Course –II<br>Industrial Waste Treatment Lab. | 5CH227PC/<br>5CT225PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Programme Core Course –III<br>Computer Programming & Application Lab. | 5CH228PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 8 | Multidisciplinary Minor –III<br>Chemical Engineering in Liquid Waste Management | 5CH229M | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| 9 | Multidisciplinary Minor –IV<br>Chemical Engineering in Solid Waste Management | 5CH230M | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| 10 | Multidisciplinary Minor –III Lab. –I<br>Chemical Engineering in Liquid Waste Management Lab. | 5CH231M | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 11 | Open Elective- III<br>Risk & Safety Management | 5CH232OE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **750** | |

**L: Lecture** **P: Practical** **T: Tutorial** **MSE: Mid Semester Exam** **ESE: End Semester Exam** **IE: Internal Evaluation** **INT: Internal** **EXT: External**

| | **Scheme for Third Year Four Year Undergraduate Engineering Degree Programme**<br>**B.Tech. in (Chemical Engineering/ Chemical Technology).**<br>**(Semester -VI) Level – 5.5** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sr No.** | **Course Name** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total** | **ESE Time Hrs.)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Programme Core Course –I<br>Mass Transfer -I | 6CH233PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Programme Core Course-II<br>Petrochemical Technology | 6CH234PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Programme Core Course-III<br>Chemical Reaction Engineering-I | 6CH235PC/<br>6CT235PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 4 | Program Elective Course –II<br>Organic Chemical Technology<br>Fuel Cells and Hydrogen Energy<br>Food Science and Engineering | <br>6CH236PE<br>6CH237PE<br>6CH238PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 5 | Program Elective Course –III<br>Process Equipment Design & Drawing<br>Thermodynamics of Phase & Chemical Equilibrium<br>Renewable Energy Sources | <br>6CH239PE/<br>6CT234PE<br>6CH240PE<br>6CH241PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 6 | Programme Core Course –<br>I Mass Transfer –I Lab. | 6CH242PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Programme Core Course –II<br>Petrochemical Technology Lab. | 6CH243PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 8 | Programme Core Course –III<br>Chemical Reaction Engineering-I Lab. | 6CH244PC/<br>6CT238PE | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 9 | Multidisciplinary Minor –V<br>Environmental Impact & Risk Assessment | 6CH245M | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | **Vocational and Skill Enhancement Courses** | | | | | | | | | | | | |
| 10 | VSEC -V (Technical Dept. Specific)<br>Minor Project on Recent Developments | 6CH401VS | 1 | 2 | 0 | 3 | 2 | | | 50 | - | 50 | |
| | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **750** | |

*A Minor Project batch should not be more than 4 students in a batch so as to imbibe the research and development acumen in students by paying individual attention to each student by the mentor.

* Students are expected to work in a group, carry out a small and applicable project work and present it in a very professional manner before all staff and students of the department. A panel of experts will evaluate and guide students for their better prospects.

Scheme for Multiple Entry and Exit

| **Exit option -3 (L7): Award of UG Degree in Major with 132 credits and an additional 8 credits** | | | |
|---|---|---|---|
| **Exit Courses** | | | |
| 1 | Optimization of Chemical Processes & Project | **Online/offline certification Course** | **8** |
| 2 | Computer Aided Process Synthesis & Project | | **8** |
| 3 | Two Month Internship at Chemical Industry in Production, Designing or Waste Treatment Plant & Project | | **8** |

Board of Studies in each subject is expected to specify different courses (combined of total 08 credits for the award of UG Degree related with the major of respective discipline.

**Internship/On job Training**:

- In the Eighth semester, every student will have to undergo an internship and/or On Job Training. The Internship would be of 12 credits.
- The total duration of the internship would be for a period equivalent to 12 Calendar weeks.
- The internship may be completed in one or more organizations as described below.
- The internship could be of the following forms: Industrial internship in a company (within India or Abroad) involved in R&D / design / manufacturing (QA/QC/Plant Engineering / Stores and Purchase) / marketing / finance / consultancy / Technical services / Engineering / Projects, etc.
- At the end of the internship, each student will submit a written report based on the work carried out during the Internship.
- The report will be countersigned by the Supervisor from Industry / Institute as the case may be.
- Performance of the student will be assessed based on the written report and a presentation to Department.
- Feedback will be taken from Industry mentors and this will used while assigning the grades.

| | **Scheme for Fourth Year Four Year Undergraduate Engineering Degree Programme**<br>**B.Tech. in (Chemical Engineering/ Chemical Technology).**<br>**(Semester -VII)** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sr No.** | **Course Name** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total** | **ESE Time Hrs)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Programme Core Course –<br>I Mass Transfer -II | 7CH300PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Programme Core Course-II<br>Process Dynamics & Control | 7CH301PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Program Elective Course –IV<br>System Modeling<br>Plant Design & Process Engineering<br><br>Novel Separation Processes | 7CH302PE<br>7CH303PE/<br>7CT302PE<br>7CH304PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 4 | Program Elective Course –V<br>Transport Phenomenon<br><br>Multiphase Flow<br>Principles of Non-Newtonian Fluid Mechanics | 7CH305PE/<br>7CT303PE<br>7CH306PE<br>7CH307PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 5 | Program Elective Course –VI<br>Chemical Reaction Engineering-II<br><br>Chemical Reactor Analysis & Design<br>Introduction to Statistical Thermodynamics | 7CH308PE/<br>7CT304PE<br>7CH309PE<br>7CH310PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 6 | Programme Core Course Lab. –I<br>Mass Transfer –II Lab. | 7CH311PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Programme Core Course Lab. –II<br>Process Dynamics & Control Lab. | 7CH312PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | Multidisciplinary Minor –VI Advance Methods of Industrial Waste Treatment | 7CH313M | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. Pa |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | Multidisciplinary Minor-VI Lab. –II Advance Methods of Industrial Waste Treatment Lab. | 7CH314M | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | . |
| | **Project** | | | | | | | | | | | | |
| 10 | Project (Phase-I) | 7CH402PR | 0 | 4 | 0 | 4 | 2 | | | 50 | 50 | 100 | |
| | TOTAL | | 17 | 10 | 0 | 27 | **22** | | | | | **800** | |

**L: Lecture P: Practical T: Tutorial MSE: Mid Semester Exam ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External**

*For Multidisciplinary Minor course the committee of BoS may decide Theory and /Or Practical to be assigned to a specific multidisciplinary minor course within the limit of 2 Credits per course (for instance, Theory: 2 Credits or Theory: 1 Credit and Practical: 1 Credit or Practical: 2 Credits)

| | **Scheme for Fourth Year Four Year Undergraduate Engineering Degree Programme B.Tech. in (Chemical Engineering/ Chemical Technology). (Semester -VIII) Level – 6.0** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sr No.** | **Course Name** | **Code** | **Course Plan per Week (Hrs.)** | | | | **Credits** | **Theory Evaluation** | | **Practical Evaluation** | | **Total** | **ESE Time Hrs)** |
| | | | **L** | **P** | **T** | **Hrs.** | | **IE** | **ESE** | **INT** | **EXT** | | |
| | **Core Courses** | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 1 | Research Methodology | 8CH403RM | 4* | | | 4 | 4 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Industry Internship | 8CH404OJT | 0 | 24 | 0 | 24 | 12 | | | 100 | 200 | 300 | -- |
| 3 | Project (Phase-II) | 8CH405PR | 0 | 4 | 0 | 4 | 2 | | | 50 | 50 | 100 | -- |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TOTAL | | 4 | 28 | 0 | 32 | **18** | | | | | **500** | |

**L: Lecture P: Practical T: Tutorial MSE: Mid Semester Exam ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External**

***The course on Research Methodology may be completed by the student in Online mode (Swayam, MOOC's, any other platform approved by AICTE OR on the LMS platform offered by the Institute).**

## Multidisciplinary Minor Offered by
## (Chemical Engineering Department) Multidisciplinary Minor– in Chemical Engineering

| Sem. | Credits | Multidisciplinary Minor | Chemical Engineering |
|---|---|---|---|
| III | 2 | Multidisciplinary Minor –I (3CH205M) | Environmental Pollution: Policies and Regulations |
| IV | 2 | Multidisciplinary Minor –II (4CH214M) | Chemical Engineering in Air Pollution and Control |
| V | 2 | Multidisciplinary Minor –III (5CH229M) | Chemical Engineering in Liquid Waste Management |
| V | 2 | Multidisciplinary Minor –IV (5CH230M) | Chemical Engineering in Solid Waste Management |
| V | 1 | Multidisciplinary Minor –III Lab. (5CH231M) | Chemical Engineering in Liquid Waste Management Lab. |
| VI | 2 | Multidisciplinary Minor –V (6CH245M) | Environmental Impact & Risk Assessment |
| VII | 2 | Multidisciplinary Minor –VI ( 7CH313M) | Advance Methods of Industrial Waste Treatment |
| VII | 1 | Multidisciplinary Minor –VI Lab. (7CH314M) | Advance Methods of Industrial Waste Treatment Lab. |
| **Total** | **14** | | |

**The students from other branches than Chemical Engineering can offer this MDM in IIIrd Semester and will have to follow the path vertically in the subsequent semesters.**

## Open Elective Course

| Open Elective I (III Semester) | Open Elective II (IV Semester) | Open Elective III (V Semester) |
|---|---|---|
| De Carbonization Technologies (3CH206OE) | Water Treatment Technologies (4CH216OE) | Risk & Safety Management (5CH232OE) |

## Double Minors (Multidisciplinary and Specialization Minors)

## Specialization (Chemical Engineering) Minor Courses

### [B.Tech. Chemical Engineering with Major Chemical Eng. with Double Minors (Multidisciplinary and Specialization Minors)] Double Minor-Basket

| Sem | Credits | DM- I Chemical Process Safety | Sem | Credits | DM- III Petrochemical Technology |
|---|---|---|---|---|---|
| III | 3 | Industrial Hygiene and Occupational Health (3CH260DM1) | III | 3 | Petroleum Exploration and Recovery Techniques (3CH268DM3) |
| IV | 3 | Fire Safety and Explosion Control (4CH261DM1) | IV | 3 | Natural Gas Engineering (4CH269DM3) |
| V | 3 | EHS Management and Control (5CH262DM1) | V | 3 | Petroleum Primary Processing Technology (5CH270DM3) |
| VI | 3 | Safety in Petroleum Industry (6CH263DM1) | VI | 3 | Petrochemical analysis and testing (6CH271DM3) |
| VII | 3 | Chemical and Process Safety Management (7CH315DM1) | VII | 3 | Petroleum Secondary Processing Technology (7CH319DM3) |
| VIII | 3 | Environment and Disaster Management (8CH316DM1) | VIII | 3 | Catalytic Reaction Engineering (8CH320DM3) |
| **Total** | **18** | | **Total** | **18** | |

| Sem | Credits | DM- II Biofuels Technology | Sem | Credits | DM- IV Polymer Technology |
|---|---|---|---|---|---|
| III | 3 | Biofuels- Types and Applications (3CH264DM2) | III | 3 | Polymer Science & Technology (3CH272DM4) |
| IV | 3 | Biogas- Production Process Engineering (4CH265DM2) | IV | 3 | Thermoplastics Polymer Technology (4CH273DM4) |
| V | 3 | Biodiesel- Production Process Engineering (5CH266DM2) | V | 3 | Thermoset Polymer Technology (5CH274DM4) |
| VI | 3 | Hydrogen- Production Process Engineering (6CH267DM2) | VI | 3 | Compounding & processing of polymers (6CH275DM4) |
| VII | 3 | Fuel Cells- Production Process Engineering (7CH317DM2) | VII | 3 | Design & Fabrication of Moulds (7CH321DM4) |
| VIII | 3 | Biofuels – Indian and Global Scenario (8CH318DM2) | VIII | 3 | Packaging & Decoration of plastics (8CH322DM4) |
| **Total** | **18** | | **Total** | **18** | |

## Honors with Research and Multidisciplinary Minor Research Courses

### (B. Tech Chemical Engineering - Honors with Research and Multidisciplinary Minor)

| Sem | Credits | Name of Course |
|---|---|---|
| VII | 9 | Research Project - I |
| VIII | 9 | Research Project - II |

## Programme Elective Course Basket

| Programme Elective I (V Semester) | Programme Elective II (VI Semester) | Programme Elective III (VI Semester) | Programme Elective IV (VII Semester) | Programme Elective V (VII Semester) | Programme Elective VI (VII Semester) |
|---|---|---|---|---|---|
| Inorganic Chemical Technology 5CH223PE | Organic Chemical Technology 6CH236PE | Process Equipment Design & Drawing 6CH239PE | System Modeling 7CH302PE | Transport Phenomenon 7CH305PE | Chemical Reaction Engineering-II 7CH308PE |
| Biochemical Engineering 5CH224PE | Fuel Cells and Hydrogen Energy 6CH237PE | Thermodynamics of Phase & Chemical Equilibrium 6CH240PE | Plant Design & Process Engineering 7CH303PE | Multiphase Flow 7CH306PE | Chemical Reactor Analysis & Design 7CH309PE |
| Material Science & Engineering 5CH225PE | Food Science and Engineering 6CH238PE | Renewable Energy Sources 6CH241PE | Novel Separation Processes 7CH304PE | Principles of non-Newtonian Fluid Mechanics 7CH307PE | Introduction to Statistical Thermodynamics 7CH310PE |

**Sant Gadge Baba Amravati University, Amravati**

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**THIRD SEMESTER B.TECH (CHEMICAL TECHNOLOGY) (Food/Pulp & Paper/Oil & Paint/Petrochemical Technology)**

| Sr No. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total | ESE Time Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Programme Core Course -I Chemical Engineering Thermodynamics | 3CT200PC/ 3CH200PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Programme Core Course –II Process Calculation | 3CT201PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Programme Core Course –III Chemical Engineering Analysis | 3CT202PC/ 3CH202PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 4 | Comm. Engg. Project/ Field Project | 3CT400EL | 0 | 4 | 0 | 4 | 2 | | | 25 | 25 | 50 | |
| 5 | Programme Core Course –II Chemical Engineering Thermodynamics Lab. | 3CT203PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 6 | Programme Core Course –III Chemical Engineering Analysis Lab. | 3CT204PC/ 3CH204PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 7 | Multidisciplinary Minor –I Offered by Uni./ Swayam / NPTEL / MOOCS /other platform approved by AICTE | 3CT205M | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00 Hrs. |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 8 | Open Elective –I From any Discipline; Humanity/ Commerce & Management/ Science/ Interdisciplinary | 3CT206OE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | - | - | 100 | 3 Hrs. |
| | **HSSMC (Entrepreneurship/ Economics/ Management Course)** | | | | | | | | | | | | |
| 9 | Entrepreneurship Development Engineering Economics | 3CT207EM/ 3CH207EM | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | **Value Education Course (VEC)** | | | | | | | | | | | | |
| 10 | Environmental Science Environmental Studies | 3CT208VE/ 3CH208VE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **700** | |



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**FOURTH SEMESTER B.TECH (CHEMICAL TECHNOLOGY) (Food/Pulp & Paper/Oil & Paint/Petrochemical Technology)**

| Sr No. | Course Name | Code | Course Plan per Week(Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total | ESE Time Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Programme Core Course-I<br>Fluid Flow Operation | 4CT209PC/<br>4CH209PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Programme Core Course-II<br>Mechanical Operation | 4CT210PC/<br>4CH210PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Programme Core Course –III<br>**Food Technology Sp. Tech-I**<br>**Pulp & Paper Technology Sp. Tech-I**<br>**Oil & Paint Technology Sp. Tech-I**<br>**Petrochemical Technology Sp. Tech-I** | <br>4FT211PC<br>4PT211PC<br>4OT211PC<br>4PC211PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 4 | Programme Core Course –I<br>Fluid Flow Operation Lab. | 4CT212PC/<br>4CH212PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 5 | Programme Core Course –II<br>Mechanical Operation Lab. | 4CT213PC/<br>4CH213PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 6 | Programme Core Course –III Lab.<br>**Food Technology Sp. Tech-I Lab.**<br>**Pulp & Paper Technology Sp. Tech-I Lab.**<br>**Oil & Paint Technology Sp. Tech-I Lab.**<br>**Petrochemical Technology Sp. Tech-I Lab.** | <br>4FT214PC<br>4PT214PC<br>4OT214PC<br>4PC214PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 7 | Multidisciplinary Minor -II<br>Offered by Uni./ Swayam / NPTEL / MOOCS /other platform approved by AICTE | 4CT215M | 2 | 0 | 0 | 2 | 2 | 20 | 30 | - | - | 50 | 2.00 Hrs. |
| | **Vocational and Skill Enhancement Courses** | | | | | | | | | | | | |
| 8 | VSEC-III<br>Machine Design & Drawing | 4CT216VS/<br>4CH215VS | 1 | 2 | 0 | 3 | 2 | | | 50 | - | 50 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 9 | Open Elective- II<br>From any Discipline; Humanity/ Commerce & Management/ Science/ Interdisciplinary | 4CT217OE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | **HSSMC (Entrepreneurship/ Economics/ Management Course)** | | | | | | | | | | | | |
| 10 | Management Related /Engg.<br>Economics Industrial Management | 4CT218EM/<br>4CH217EM | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | **Value Education Course (VEC)** | | | | | | | | | | | | |
| 11 | Environmental Science / UHV /VE<br>Human Values & Professional Ethics | 4CH219VE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **700** | |

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**Sant Gadge Baba Amravati University, Amravati**
Scheme of Teaching, Learning, Examination and Evaluation leading to Four Years UG Degree Program NEP -2020 Model Curriculum for Bachelor Degree B.Tech Chemical Technology Major
**FIFTH SEMESTER B.TECH (CHEMICAL TECHNOLOGY) (Food/Pulp & Paper/Oil & Paint/Petrochemical Technology)**

| Sr No. | Course Name | Code | Course Plan per Week(Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total | ESE Time Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Programme Core Course – I Heat Transfer | 5CT220PC/ 5CH220PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Programme Core Course-II Industrial Waste Treatment | 5CT221PC/ 5CH221PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Programme Core Course-III<br>**Food Technology Sp. Tech-II**<br>**Pulp & Paper Technology Sp. Tech-II**<br>**Oil & Paint Technology Sp. Tech-II**<br>**Petrochemical Technology Sp. Tech-II** | <br>5FT222PC<br>5PT222PC<br>5OT222PC<br>5PC222PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 4 | Programme Elective Course –I Computer Programming & Application | 5CT223PE/ 5CH222PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 5 | Programme Core Course – I Heat Transfer Lab. | 5CT224PC/ 5CH226PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 6 | Programme Core Course –II Industrial Waste Treatment Lab. | 5CT225PC/ 5CH227PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Programme Core Course –III<br>**Food Technology Sp. Tech-II**<br>**Pulp & Paper Technology Sp. Tech-II**<br>**Oil & Paint Technology Sp. Tech-II**<br>**Petrochemical Technology Sp. Tech-II** | <br>5FT226PC<br>5PT226PC<br>5OT226PC<br>5PC226PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 8 | Multidisciplinary Minor –III Offered by Uni./ Swayam / NPTEL / MOOCS /other platform approved by AICTE | 5CT227M | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| 9 | Multidisciplinary Minor –IV Offered by Uni./ Swayam / NPTEL / MOOCS /other platform approved by AICTE | 5CT228M | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| 10 | Multidisciplinary Minor – III Lab. -I Offered by Uni./ Swayam / NPTEL / MOOCS /other platform approved by AICTE | 5CT229M | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Open Elective other than a particular Program** | | | | | | | | | | | | |
| 11 | Open Elective- III From any Discipline; Humanity/ Commerce & Management/ Science/ Interdisciplinary | 5CT230OE | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **750** | |

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**SIXTH SEMESTER B.TECH (CHEMICAL TECHNOLOGY) (Food/Pulp & Paper/Oil & Paint/Petrochemical Technology)**

| Sr No. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total | ESE Time Hrs.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Programme Core Course –I<br>Mass Transfer | 6CT231PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Programme Core Course-II<br>**Food Technology Sp. Tech-III**<br>**Pulp & Paper Technology Sp. Tech-III**<br>**Oil & Paint Technology Sp. Tech-III**<br>**Petrochemical Technology Sp. Tech-III** | <br>6FT232PC<br>6PT232PC<br>6OT232PC<br>6PC232PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Programme Core Course-III<br>**Food Technology Sp. Tech-IV**<br>**Pulp & Paper Technology Sp. Tech-IV**<br>**Oil & Paint Technology Sp. Tech-IV**<br>**Petrochemical Technology Sp. Tech-IV** | <br>6FT233PC<br>6PT233PC<br>6OT233PC<br>6PC233PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 4 | Program Elective Course –II<br>Process Equipment Design & Drawing | 6CT234PE/<br>6CH239PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 5 | Program Elective Course –III<br>Chemical Reaction Engineering-I | 6CT235PE/<br>6CH235PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 6 | Programme Core Course –I<br>Mass Transfer Lab. | 6CT236PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Programme Core Course –II<br>**Food Technology Sp. Tech-IV**<br>**Pulp & Paper Technology Sp. Tech-IV**<br>**Oil & Paint Technology Sp. Tech-IV**<br>**Petrochemical Technology Sp. Tech-IV** | <br>6FT237PC<br>6PT237PC<br>6OT237PC<br>6PC237PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 8 | Program Elective Course –III<br>Chemical Reaction Engineering-I Lab. | 6CT238PE/<br>6CH244PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 9 | Multidisciplinary Minor –V<br>Offered by Uni./ Swayam / NPTEL / MOOCS /other platform approved by AICTE | 6CT239M | 2 | 0 | 0 | 2 | 2 | 20 | 30 | | | 50 | 2.00 Hrs. |
| | **Vocational and Skill Enhancement Courses** | | | | | | | | | | | | |
| 10 | VSEC -V (Technical Dept. Specific)<br>Simulation Lab. | 6CT240VS | 1 | 2 | 0 | 3 | 2 | | | 50 | - | 50 | |
| | TOTAL | | 18 | 08 | 0 | 26 | **22** | | | | | **750** | |

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**SEVENTH SEMESTER B.TECH (CHEMICAL TECHNOLOGY) (Food/Pulp & Paper/Oil & Paint/Petrochemical Technology)**

| Sr. No. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total | ESE Time Hrs) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | **Core Courses** | | | | | | | | | | | | |
| 1 | Programme Core Course –I<br>**Food Technology Sp. Tech-V**<br>**Pulp & Paper Technology Sp. Tech-V**<br>**Oil & Paint Technology Sp. Tech-V**<br>**Petrochemical Technology Sp. Tech-V** | <br>7FT300PC<br>7PT300PC<br>7OT300PC<br>7PC300PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Programme Core Course-II<br>**Food Technology Sp. Tech-VI**<br>**Pulp & Paper Technology Sp. Tech- VI**<br>**Oil & Paint Technology Sp. Tech- VI**<br>**Petrochemical Technology Sp. Tech- VI** | <br>7FT301PC<br>7PT301PC<br>7OT301PC<br>7PC301PC | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 3 | Program Elective Course –IV<br>Plant Design & Project Engineering | 7CT302PE/<br>7CH303PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 4 | Program Elective Course –V<br>Transport Phenomenon | 7CT303PE/<br>7CH305PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| 5 | Program Elective Course –VI<br>Chemical Reaction Engineering II | 7CT304PE/<br>7CH308PE | 3 | 0 | 0 | 3 | 3 | 40 | 60 | | | 100 | 3 Hrs. |
| | **Laboratory Courses** | | | | | | | | | | | | |
| 6 | Programme Core Course-II<br>**Food Technology Sp. Tech-VI**<br>**Pulp & Paper Technology Sp. Tech- VI**<br>**Oil & Paint Technology Sp. Tech- VI**<br>**Petrochemical Technology Sp. Tech- VI** | <br>7FT305PC<br>7PT305PC<br>7OT305PC<br>7PC305PC | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| 7 | Program Elective Course –VI<br>Chemical Reaction Engineering II | 7CT306PE/ | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | |
| | **Multidisciplinary Minor** | | | | | | | | | | | | |
| 8 | Multidisciplinary Minor -VI*<br>Offered by Uni./ Swayam / NPTEL / MOOCS /other platform approved by AICTE | 7CT307M | 3 | 0 | 0 | 3 | 3 | 20 | 30 | | | 50 | 2.00 Hrs. |
| 9 | Multidisciplinary Minor – VI Lab. – II Offered by Uni./ Swayam / NPTEL / MOOCS /other platform approved by AICTE | 7CT308M | 0 | 2 | 0 | 2 | 1 | | | 25 | 25 | 50 | . |
| | **Project** | | | | | | | | | | | | |
| 10 | Project / Seminar (FT/PT/OT/PC) | 7CT401PR | 0 | 4 | 0 | 4 | 2 | | | 50 | 50 | 100 | |
| | TOTAL | | 9 | 27 | 0 | 36 | **22** | | | | | **800** | |

**L: Lecture P: Practical T: Tutorial MSE: Mid Semester Exam ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External**

| | Scheme for Fourth Year Four Year Undergraduate Engineering Degree Programme<br>B.Tech. in (Chemical Engineering/ Chemical Technology).<br>(Semester -VIII) Level – 6.0 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sr No. | Course Name | Code | Course Plan per Week (Hrs.) | | | | Credits | Theory Evaluation | | Practical Evaluation | | Total | ESE Time Hrs) |
| | | | L | P | T | Hrs. | | IE | ESE | INT | EXT | | |
| | Core Courses | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 1 | Research Methodology | 8CT402RM | 4* | | | 4 | 4 | 40 | 60 | | | 100 | 3 Hrs. |
| 2 | Industry Internship | 8CT403OJT | 0 | 24 | 0 | 24 | 12 | | | 100 | 200 | 300 | -- |
| 3 | Project (FT/PT/OT/PC) | 8CT404PR | 0 | 4 | 0 | 4 | 2 | | | 50 | 50 | 100 | --. |
| | TOTAL | | 4 | 28 | 0 | 32 | **18** | | | | | **500** | |

**L: Lecture P: Practical T: Tutorial MSE: Mid Semester Exam ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External**

**Abbreviations:** BSC: Basic Science Course, ESC: Engineering Science Course, PCC: Program Core Course, PEC: Program Elective Course, MDM: Multi-disciplinary Minor: Different discipline of engineering or different faculty altogether, OE: Open Elective: To be chosen Compulsorily from faculty other than major discipline, VSEC: Vocational and Skill Enhancement Course, AEC: Ability Enhancement Course, IKS: Indian Knowledge System, VEC: Value Education Course: e.g. Understanding India, Environmental Science / Education / Digital and Tech solutions ELC: Experimental Learning Course, CCA: Co-curricular activities,
EXT: External, INT: Internal.

## Internship/On job Training:

- In the Eighth semester, every student will have to undergo an internship and/or On Job Training. The Internship would be of 12 credits.
- The total duration of the internship would be for a period equivalent to 12 Calendar weeks.
- The internship may be completed in one or more organizations as described below.
- The internship could be of the following forms: Industrial internship in a company (within India or Abroad) involved in R&D / design / manufacturing (QA/QC/Plant
- Engineering / Stores and Purchase) / marketing / finance / consultancy / Technical services / Engineering / Projects, etc.
- At the end of the internship, each student will submit a written report based on the work carried out during the Internship.
- The report will be countersigned by the Supervisor from Industry / Institute as the case may be.
- Performance of the student will be assessed based on the written report and a presentation to Department.
- Feedback will be taken from Industry mentors and this will used while assigning the grades.

| | | |
|---|---|---|
| Internship/Apprenticeship<br>FP/CEP | Internal | Assessment of these verticals shall be based on various activities/ practices. It shall be evaluated by giving maximum marks of 50 per 2 credit course with separate |

| | | |
|---|---|---|
| CCA | | activity weightage |

**University offered Basket of Multidisciplinary Minor Courses (B.Tech Chemical Technology (Food/Pulp & Paper/Oil & Paint/Petrochemical Technology) with Multidisciplinary Minor: Environment and Waste Management)**

| **Environment and waste Management** | | | | | |
|---|---|---|---|---|---|
| **Semester III** | **Semester IV** | **Semester V** | **Semester VI** | **Semester VII** | **Semester VIII** |
| Air Pollution and Control | Solid Waste Management | Environmental Impact Assessment | Emerging Technologies in Renewable Energy Sources | Industrial wastewater treatment | Corrosion control |
| Nano materials and their applications | Design and Synthesis of nanomaterials | Characterization Techniques for Nanomaterials | Quantum Mechanics for Nanotechnologists | Nano Biotechnology | Smart Sensors |

**Basket of Multidisciplinary Minor Courses (B.Tech Chemical Technology (Food/Pulp & Paper/Oil & Paint/Petrochemical Technology) with Multidisciplinary Minor with Honors)**

| **Sem** | **Food Technology** | **Oil Technology** | **Petrochemical Technology** | **Pulp & Paper Technology** |
|---|---|---|---|---|
| III | Food Chemistry | Chemistry of Oils & Allied Products | Petroleum Exploration and Exploitation Techniques | Wood Chemistry |
| IV | Advances in Food Technology | Surface coating | Advances in Petrochemical Technology | Advances in Pulp & paper Technology |
| V | Food process engineering | Refining of Oils | Petroleum Primary Processing Technology | Chemical Recovery |
| VI | Food process Technology-I | Technology of Oils, Oleo Chemicals and Surfactants | Petrochemical analysis and testing | Paper Making - I |
| VII | Food process Technology-II | Quality Assurance of Oils and Allied Products | Petroleum Secondary Processing Technology | Paper Making - II |
| VIII | Food Packaging Technology | Essential Oils & Cosmetics | Catalytic Reaction Engineering | Paper Properties & Conversion |

## Open Elective Course

| **Open Elective I (III Semester)** | **Open Elective II (IV Semester)** | **Open Elective III (V Semester)** |
|---|---|---|
| Exploration And Production of Petroleum | Petroleum Refining | Quality control of Petroleum Product |

## (B.Tech. Chemical Technology-Honors with Research and Multidisciplinary Minor)

| Semester | Credits | Name of Course |
|---|---|---|
| VII | **18*(** These credits will be over and above the min.160-max.176 credits prescribed for Four Year Multidisciplinary Bachelor's Degree in Engg./Tech. Program. | Research Project - I |
| VIII | | Research Project - II |