# CURRICULUM

# OF

# 2018 ONWARD UNDERGRADUATE ADMISSION BATCH

1. **1St YEAR (COMMON)**
2. **BIOTECHNOLOGY- B. TECH.**
3. **CIVIL ENGINEERING- B. TECH.**
4. **CHEMICAL ENGINEERING- B. TECH.**
5. **COMPUTER SCIENCE AND ENGINEERING- B. TECH.**
6. **ELECTRICAL ENGINEERING- B. TECH.**
7. **ELECTRONICS AND COMMUNICATION ENGINEERING- B. TECH.**
8. **MECHANICAL ENGINEERING- B. TECH.**
9. **METALLURGICAL AND MATERIALS ENGINEERING- B. TECH.**
10. **BIOTECHNOLOGY- DUAL DEGREE B. TECH.- M. TECH.**
11. **CHEMICAL ENGINEERING- DUAL DEGREE B. TECH.- M. TECH.**
12. **OPEN ELECTIVE COURSE BASKETS**
    **(THE STUDENT CAN OPT ANY OPEN ELECTIVE SUBJECT(S) THAT ARE OFFERED IN A PARTICULAR SEMESTER, EXCEPT THE SUBJECT(S) WITH HIS/ HER OWN DEPARTMENT CODE)**
13. **DEPTH ELECTIVE COURSE BASKETS**
    **(THE STUDENTS PRIMARILY WILL OPT FROM THE DEPTH ELECTIVE SUBJECT(S) THAT ARE OFFERED IN A PARTICULAR SEMESTER BY HIS/ HER OWN DEPARTMENT. HOWEVER, A STUDENT CAN OPT FOR DEPTH ELECTIVE SUBJECT(S) THAT ARE OFFERED BY OTHER DEPARTMENT IN A PARTICULAR SEMESTER, WITH THE PERMISSION/ CONSENT FROM HIS/ HER HEAD OF THE DEPARTMENT AND THE CONCERNED TEACHER OF THAT SUBJECT)**
14. **CHEMISTRY- 5 YEAR INTEGRATED M. SC.**

**PLACED FOR COMPREHENSIVE APPROVAL IN THE UGAC MEETING DATED ____10/05/2019_____**

**APPROVED IN THE SENATE MEETING DATED __13/05/2019__ and published on ____30/05/2019_____**

**1st revision_ 27/06/2019_**

## REVISIONS:

**1st revision- 27/06/2019**

**Change of subject codes:** **4th SEM EE: ECS452 > ECS481**
**5th SEM EE: ECS551 > ECS581; EES552 > EES551; EES553 > EES552**
**6th SEM BT: BTE619 > BTE618**

**Inclusion of elective subjects:** **5th SEM OPEN ELECTIVE: ESO541**

**CURRICULUM OF 2018 ONWARD UNDERGRADUATE ADMISSION BATCH**

**First semester and second semester are common to all branches of Engineering and 5-year Integrated Chemistry programme. Some of the courses are grouped for interchange between first and second semester for half of the students totalling credit unit 44 in first year (1st and 2nd semester combined).**

**L= Lecture hour/ week; T= Tutorial hour/ week; S= Sessional/ practical hour/ week**

**C= Subject credit point; H= Subject contact hour/ week.**

| Semester - I | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl. No | Code | Subject | L | T | S | C | H |
| 1 | MAC01 | Mathematics - I | 3 | 1 | 0 | 4.0 | 4 |
| 2 | PHC01 | Engineering Physics | 2 | 1 | 0 | 3.0 | 3 |
| 3 | CYC01 | Engineering Chemistry | 2 | 1 | 0 | 3.0 | 3 |
| 4 | XEC01 | Engineering Mechanics | 2 | 1 | 0 | 3.0 | 3 |
| 5 | ESC01 | Environmental Science | 2 | 0 | 0 | 2.0 | 2 |
| 6 | XES51 | Engineering Graphics | 1 | 0 | 3 | 2.5 | 4 |
| 7 | HSS51 | Professional Communication Laboratory | 1 | 0 | 2 | 2.0 | 3 |
| 8 | PHS51 | Physics Laboratory | 0 | 0 | 2 | 1.0 | 2 |
| 9 | CYS51 | Chemistry Laboratory | 0 | 0 | 2 | 1.0 | 2 |
| 10 | WSS51 | Workshop Practice | 0 | 0 | 3 | 1.5 | 3 |
| 11 | XXS51 | Co-curricular Activities - I | 0 | 0 | 2 | 1.0 | 2 |
| | | TOTAL | 13 | 4 | 14 | 24.0 | 31 |
| Semester - II | | | | | | | |
| Sl. No | Code | Subject | L | T | S | C | H |
| 1 | MAC02 | Mathematics - II | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CSC01 | Introduction to Computing | 2 | 1 | 0 | 3.0 | 3 |
| 3 | ECC01 | Basic Electronics | 2 | 1 | 0 | 3.0 | 3 |
| 4 | EEC01 | Electrical Technology | 2 | 1 | 0 | 3.0 | 3 |
| 5 | BTC01 | Life Science | 2 | 0 | 0 | 2.0 | 2 |
| 6 | XES52 | Graphical Analysis using CAD | 0 | 0 | 2 | 1.0 | 2 |
| 7 | CSS51 | Computing Laboratory | 0 | 0 | 2 | 1.0 | 2 |
| 8 | ECS51 | Basic Electronics Laboratory | 0 | 0 | 2 | 1.0 | 2 |
| 9 | EES51 | Electrical Technology Laboratory | 0 | 0 | 2 | 1.0 | 2 |
| 10 | XXS52 | Co-curricular Activities - II | 0 | 0 | 2 | 1.0 | 2 |
| | | TOTAL | 11 | 4 | 10 | 20.0 | 25 |

**CURRICULUM OF 2018 ONWARD UNDERGRADUATE ADMISSION BATCH**

**BIOTECHNOLOGY- B.TECH.**

| Semester - III | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | MAC331 | Mathematics - III | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CHC331 | Process Calculation and Thermodynamics | 3 | 1 | 0 | 4.0 | 4 |
| 3 | BTC301 | Cell biology and Genetics | 3 | 1 | 0 | 4.0 | 4 |
| 4 | BTC302 | Microbiology and Bioprocess Technology | 3 | 1 | 0 | 4.0 | 4 |
| 5 | BTC303 | Biochemistry and Enzyme Technology | 3 | 0 | 0 | 3.0 | 3 |
| 6 | BTS352 | Biochemistry Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | BTS 351 | Microbiology Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | XXS381 | Co-curricular Activities - III (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 4 | 6 | 22.0 | 25 |
| **Semester - IV** | | | | | | | |
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | BTC401 | Molecular Biology and Recombinant DNA Technology | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CHC431 | Unit Operation of Chemical Engineering- I | 3 | 1 | 0 | 4.0 | 4 |
| 3 | BTC402 | Immunology | 3 | 1 | 0 | 4.0 | 4 |
| 4 | CSC431 | Programming and Data Structure | 3 | 0 | 0 | 3.0 | 3 |
| 5 | YYO44* | Open Elective - 1 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | BTS451 | Cell Biology and Genetics Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CHS481 | Unit Operations of Chemical Engineering-I Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | CSS481 | Programming and Data Structure Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS481 | Co-curricular Activities - IV (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 3 | 9 | 22.5 | 27 |
| **Semester - V** | | | | | | | |
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | BTC501 | Biochemical Reaction Engineering and Bioreactor Design | 3 | 1 | 0 | 4.0 | 4 |
| 2 | BTC502 | Cell and Tissue Culture | 3 | 1 | 0 | 4.0 | 4 |
| 3 | BTC503 | Bioseparation and Biochemical Analysis | 3 | 1 | 0 | 4.0 | 4 |
| 4 | CHC531 | Unit Operations of Chemical Engineering-II | 3 | 1 | 0 | 4.0 | 4 |
| 5 | YYO54* | Open Elective - 2 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | BTS551 | Immunology Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | BTS552 | Bioprocess Technology Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | CHS581 | Unit Operations of Chemical Engineering Laboratory- II | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS581 | Co-curricular Activities - V (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 4 | 9 | 23.5 | 28 |

| Semester - VI | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | HSC631 | Economics and Management Accountancy | 3 | 0 | 0 | 3.0 | 3 |
| 2 | BTC601 | Bioinformatics | 2 | 1 | 0 | 3.0 | 3 |
| 3 | CSC631 | Database Management System | 2 | 1 | 0 | 3.0 | 3 |
| 4 | CHC631 | Process Control and Instrumentation | 2 | 1 | 0 | 3.0 | 3 |
| 5 | BTE610 -- | Depth Elective - 1 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | BTE610 -- | Depth Elective - 2 | 3 | 0 | 0 | 3.0 | 3 |
| 7 | BTS651 | Molecular Biology and rDNA Technology Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | BTS652 | Bioinformatics Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | CSS681 | Database Management System Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 10 | XXS681 | Co-curricular Activities - VI (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 3 | 9 | 22.5 | 27 |
| Semester - VII | | | | | | | |
| Sl. No | Code | Subject | L | T | S | C | H |
| 1 | MSC731 | Principles of Management | 3 | 0 | 0 | 3.0 | 3 |
| 2 | BTE710 -- | Depth Elective - 3 | 3 | 0 | 0 | 3.0 | 3 |
| 3 | BTE710 -- | Depth Elective - 4 | 3 | 0 | 0 | 3.0 | 3 |
| 4 | BTE710 -- | Depth Elective - 5 | 3 | 0 | 0 | 3.0 | 3 |
| 5 | YYO74* | Open Elective - 3 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | BTS751 | Bioseparation and Biochemical Analysis Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | BTS752 | Cell and Tissue Culture Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | BTS753 | Biochemical Reaction Engineering Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | BTS754 | Vocational Training / Summer Internship and Seminar | 0 | 0 | 2 | 1.0 | 2 |
| 10 | BTS755 | Project - I | 0 | 0 | 3 | 1.0 | 3 |
| | | TOTAL | 15 | 0 | 14 | 21.5 | 29 |
| Semester - VIII | | | | | | | |
| Sl. No | Code | Subject | L | T | S | C | H |
| 1 | BTE810 -- | Depth Elective - 6 | 3 | 0 | 0 | 3.0 | 3 |
| 2 | YYO84* | Open Elective - 4 | 3 | 0 | 0 | 3.0 | 3 |
| 3 | YYO85* | Open Elective - 5 | 3 | 0 | 0 | 3.0 | 3 |
| 4 | BTS851 | Project - II | 0 | 0 | 15 | 5.0 | 15 |
| 5 | BTS852 | Project Seminar | 0 | 0 | 0 | 1.0 | 0 |
| 6 | BTS853 | Viva Voce | 0 | 0 | 0 | 1.0 | 0 |
| | | TOTAL | 9 | 0 | 15 | 16.0 | 24 |

**CREDIT UNIT OF THE PROGRAM:**

| Semester | I + II | III | IV | V | VI | VII | VIII | TOTAL |
|---|---|---|---|---|---|---|---|---|
| Credit Unit | 44.0 | 22.0 | 22.5 | 23.5 | 22.5 | 21.5 | 16.0 | 172.0 |

**CURRICULUM OF 2018 ONWARD UNDERGRADUATE ADMISSION BATCH**

**CIVIL ENGINEERING- B.TECH.**

| Semester - III | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | MAC331 | Mathematics - III | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CEC301 | Solid Mechanics | 3 | 1 | 0 | 4.0 | 4 |
| 3 | CEC302 | Fluid Mechanics | 3 | 0 | 0 | 3.0 | 3 |
| 4 | CEC303 | Building Construction and Concrete Technology | 3 | 1 | 0 | 4.0 | 4 |
| 5 | ESC331 | Geology for Civil Engineering | 3 | 0 | 0 | 3.0 | 3 |
| 6 | ESS381 | Geology Laboratory for Civil Engineering | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CES351 | Fluid Mechanics and Strength of Material Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | XXS381 | Co-curricular Activities - III (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 3 | 6 | 21.0 | 24 |
| **Semester - IV** | | | | | | | |
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | CEC401 | Structural Analysis-I | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CEC402 | Design of Concrete Structures | 3 | 1 | 0 | 4.0 | 4 |
| 3 | CEC403 | Surveying | 3 | 0 | 0 | 3.0 | 3 |
| 4 | CSC432 | Data Structure | 3 | 0 | 0 | 3.0 | 3 |
| 5 | YYO44* | Open Elective - I | 3 | 0 | 0 | 3.0 | 3 |
| 6 | CES451 | Structural Analysis Sessional-I | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CES452 | Design of Concrete Structures Sessional | 0 | 0 | 3 | 1.5 | 3 |
| 8 | CSS482 | Data Structure Sessional | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS481 | Co-curricular Activities - IV (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 2 | 9 | 21.5 | 26 |
| **Semester - V** | | | | | | | |
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | CEC501 | Structural Analysis-II | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CEC502 | Design of Steel Structures | 3 | 1 | 0 | 4.0 | 4 |
| 3 | CEC503 | Soil Mechanics | 3 | 0 | 0 | 3.0 | 3 |
| 4 | CEC504 | Transportation Engineering | 3 | 1 | 0 | 4.0 | 4 |
| 5 | YYO54* | Open Elective - 2 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | CES551 | Structural Analysis Sessional-II | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CES552 | Design of Steel Structures Sessional | 0 | 0 | 3 | 1.5 | 3 |
| 8 | CES553 | Transportation Engineering and Soil Mechanics Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | CES554 | Surveying Laboratory and Estimation Sessional | 1 | 0 | 3 | 2.5 | 4 |
| 10 | XXS581 | Co-curricular Activities - V (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 16 | 3 | 12 | 25.0 | 31 |

| Semester - VI | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | HSC631 | Economics and Management Accountancy | 3 | 0 | 0 | 3.0 | 3 |
| 2 | CEC601 | Water Resource Engineering | 3 | 1 | 0 | 4.0 | 4 |
| 3 | CEC602 | Foundation Engineering | 3 | 0 | 0 | 3.0 | 3 |
| 4 | CEC603 | Environmental Engineering | 3 | 1 | 0 | 4.0 | 4 |
| 5 | CEE610 -- | Depth Elective - 1 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | CEE610 -- | Depth Elective - 2 | 3 | 0 | 0 | 3.0 | 3 |
| 7 | CES651 | Environmental Engineering Laboratory and Computational Laboratory- I | 0 | 0 | 3 | 1.5 | 3 |
| 8 | CES653 | Concrete Technology Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS681 | Co-curricular Activities - VI (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 18 | 2 | 6 | 23.0 | 26 |
| Semester - VII | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | MSC731 | Principles of Management | 3 | 0 | 0 | 3.0 | 3 |
| 2 | CEE710 -- | Depth Elective - 3 | 3 | 0 | 0 | 3.0 | 3 |
| 3 | CEE710 -- | Depth Elective - 4 | 3 | 0 | 0 | 3.0 | 3 |
| 4 | CEE710 -- | Depth Elective - 5 | 3 | 0 | 0 | 3.0 | 3 |
| 5 | YYO74* | Open Elective - 3 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | CES751 | Project - I | 0 | 0 | 4 | 2.0 | 4 |
| 7 | CES752 | Structural Engineering Laboratory and Computational Laboratory -II | 0 | 0 | 3 | 1.5 | 3 |
| 8 | CES754 | Vocational Training / Summer Internship and Seminar | 0 | 0 | 2 | 1.0 | 2 |
| | | TOTAL | 15 | 0 | 9 | 19.5 | 24 |
| Semester - VIII | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | CEE810 -- | Depth Elective - 6 | 3 | 0 | 0 | 3.0 | 3 |
| 2 | YYO84* | Open Elective - 4 | 3 | 0 | 0 | 3.0 | 3 |
| 3 | YYO85* | Open Elective - 5 | 3 | 0 | 0 | 3.0 | 3 |
| 4 | CES851 | Project - II | 0 | 0 | 15 | 5.0 | 15 |
| 5 | CES852 | Project Seminar | 0 | 0 | 0 | 1.0 | 0 |
| 6 | CES853 | Viva Voce | 0 | 0 | 0 | 1.0 | 0 |
| | | TOTAL | 9 | 0 | 15 | 16.0 | 24 |

**CREDIT UNIT OF THE PROGRAM:**

| Semester | I + II | III | IV | V | VI | VII | VIII | TOTAL |
|---|---|---|---|---|---|---|---|---|
| Credit Unit | 44.0 | 21.0 | 21.5 | 25.0 | 23.0 | 19.5 | 16.0 | 170.0 |

**CURRICULUM OF 2018 ONWARD UNDERGRADUATE ADMISSION BATCH**

**CHEMICAL ENGINEERING- B.TECH.**

| Semester - III | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | MAC331 | Mathematics - III | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CHC301 | Process Calculations | 3 | 1 | 0 | 4.0 | 4 |
| 3 | CHC302 | Chemical Engineering Thermodynamics | 3 | 1 | 0 | 4.0 | 4 |
| 4 | CHC303 | Fluid Mechanics | 3 | 1 | 0 | 4.0 | 4 |
| 5 | CYC331 | Chemistry - II | 3 | 0 | 0 | 3.0 | 3 |
| 6 | CYS381 | Chemistry Laboratory- II | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CHS351 | Chemical Engineering Computing Laboratory- I | 0 | 0 | 3 | 1.5 | 3 |
| 8 | XXS381 | Co-curricular Activities - III (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 4 | 6 | 22.0 | 25 |
| **Semester - IV** | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | CHC401 | Heat Transfer | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CHC402 | Mechanical Operation | 3 | 1 | 0 | 4.0 | 4 |
| 3 | CHC403 | Mass Transfer- I | 3 | 1 | 0 | 4.0 | 4 |
| 4 | MEC432 | Mechanical Design of Equipment and Components | 3 | 0 | 0 | 3.0 | 3 |
| 5 | YYO44* | Open Elective - I | 3 | 0 | 0 | 3.0 | 3 |
| 6 | CHS451 | Fluid Mechanics Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CHS452 | Process Equipment Design- I Sessional | 0 | 0 | 3 | 1.5 | 3 |
| 8 | WSS481 | Workshop Practice- II | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS481 | Co-curricular Activities - IV (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 3 | 9 | 22.5 | 27 |
| **Semester - V** | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | CHC501 | Chemical Reaction Engineering | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CHC502 | Mass Transfer- II | 3 | 1 | 0 | 4.0 | 4 |
| 3 | CHC503 | Chemical Process Technology | 3 | 1 | 0 | 4.0 | 4 |
| 4 | CHC504 | Process Control and Instrumentation | 3 | 1 | 0 | 4.0 | 4 |
| 5 | YYO54* | Open Elective - 2 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | CHS551 | Heat Transfer Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CHS552 | Mechanical Operations Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | CHS553 | Process Equipment Design- II Sessional | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS581 | Co-curricular Activities - V (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 4 | 9 | 23.5 | 28 |

| Semester - VI | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | HSC631 | Economics and Management Accountancy | 3 | 0 | 0 | 3.0 | 3 |
| 2 | CHC601 | Transport Phenomena | 3 | 1 | 0 | 4.0 | 4 |
| 3 | CHC602 | Petroleum Refining and Petrochemicals | 3 | 1 | 0 | 4.0 | 4 |
| 4 | CHC603 | Process Modelling and Simulation | 3 | 0 | 0 | 3.0 | 3 |
| 5 | CHE610 -- | Depth Elective - 1 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | CHS651 | Fuel Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CHS652 | Reaction Engineering Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | CHS653 | Mass Transfer Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS681 | Co-curricular Activities - VI (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 2 | 9 | 21.5 | 26 |
| Semester - VII | | | | | | | |
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | MSC731 | Principles of Management | 3 | 0 | 0 | 3.0 | 3 |
| 2 | CHE710 -- | Depth Elective - 2 | 3 | 0 | 0 | 3.0 | 3 |
| 3 | CHE710 -- | Depth Elective - 3 | 3 | 0 | 0 | 3.0 | 3 |
| 4 | CHE710 -- | Depth Elective - 4 | 3 | 0 | 0 | 3.0 | 3 |
| 5 | YYO74* | Open Elective - 3 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | CHS751 | Process Control and Instrumentation Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CHS752 | Chemical Engineering Computing Laboratory- II | 0 | 0 | 3 | 1.5 | 3 |
| 8 | CHS753 | Computer Aided Process Equipment Design Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | CHS754 | Vocational Training / Summer Internship and Seminar | 0 | 0 | 2 | 1.0 | 2 |
| 10 | CHS755 | Project - I | 0 | 0 | 3 | 1.0 | 3 |
| | | TOTAL | 15 | 0 | 14 | 21.5 | 29 |
| Semester - VIII | | | | | | | |
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | CHE810 -- | Depth Elective - 5 | 3 | 0 | 0 | 3.0 | 3 |
| 2 | YYO84* | Open Elective - 4 | 3 | 0 | 0 | 3.0 | 3 |
| 3 | YYO85* | Open Elective - 5 | 3 | 0 | 0 | 3.0 | 3 |
| 4 | CHS851 | Project - II | 0 | 0 | 15 | 5.0 | 15 |
| 5 | CHS852 | Project Seminar | 0 | 0 | 0 | 1.0 | 0 |
| 6 | CHS853 | Viva Voce | 0 | 0 | 0 | 1.0 | 0 |
| | | TOTAL | 9 | 0 | 15 | 16.0 | 24 |

**CREDIT UNIT OF THE PROGRAM:**

| Semester | I + II | III | IV | V | VI | VII | VIII | TOTAL |
|---|---|---|---|---|---|---|---|---|
| Credit Unit | 44.0 | 22.0 | 22.5 | 23.5 | 21.5 | 21.5 | 16.0 | 171.0 |

**CURRICULUM OF 2018 ONWARD UNDERGRADUATE ADMISSION BATCH**

**COMPUTER SCIENCE AND ENGINEERING- B.TECH.**

| Semester - III | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | MAC331 | Mathematics - III | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CSC301 | Discrete Mathematics | 3 | 0 | 0 | 3.0 | 3 |
| 3 | CSC302 | Digital Logic Design | 3 | 0 | 0 | 3.0 | 3 |
| 4 | CSC303 | Data Structures and Algorithms | 3 | 1 | 0 | 4.0 | 4 |
| 5 | PHC331 | Physics of Semiconductor Devices | 3 | 0 | 0 | 3.0 | 3 |
| 6 | PHS381 | Semiconductor Devices Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CSS351 | Digital Logic Design Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | CSS352 | Data Structures and Algorithms Laboratory | 0 | 0 | 4 | 2.0 | 4 |
| 9 | XXS381 | Co-curricular Activities - III (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 2 | 10 | 22.0 | 27 |
| **Semester - IV** | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | CSC401 | Computer Organization and Architecture | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CSC402 | Theory of Computation | 3 | 0 | 0 | 3.0 | 3 |
| 3 | CSC403 | Design and Analysis of Algorithms | 3 | 1 | 0 | 4.0 | 4 |
| 4 | CSC404 | Object Oriented Programming | 2 | 1 | 0 | 3.0 | 3 |
| 5 | CSC405 | Signals and Systems | 3 | 0 | 0 | 3.0 | 3 |
| 6 | YYO44* | Open Elective - I | 3 | 0 | 0 | 3.0 | 3 |
| 7 | CSS451 | Computer Organization Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | CSS452 | Object Oriented Programming Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | CSS453 | Signal Processing Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 10 | XXS481 | Co-curricular Activities - IV (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 17 | 3 | 9 | 24.5 | 29 |
| **Semester - V** | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | CSC501 | Operating Systems | 3 | 0 | 0 | 3.0 | 3 |
| 2 | CSC502 | Database Management System | 3 | 1 | 0 | 4.0 | 4 |
| 3 | CSC503 | Compiler Design | 3 | 0 | 0 | 3.0 | 3 |
| 4 | CSC504 | Microcontroller based Systems | 3 | 0 | 0 | 3.0 | 3 |
| 5 | YYO54* | Open Elective - 2 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | CSS551 | Design and Analysis of Algorithms Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CSS552 | Microcontroller based System Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | CSS553 | Operating Systems Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS581 | Co-curricular Activities - V (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 1 | 9 | 20.5 | 25 |

| Semester - VI | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | HSC631 | Economics and Management Accountancy | 3 | 0 | 0 | 3.0 | 3 |
| 2 | CSC601 | Software Engineering | 3 | 0 | 0 | 3.0 | 3 |
| 3 | CSC602 | Data Communication and Computer Networks | 3 | 1 | 0 | 4.0 | 4 |
| 4 | CSE610 -- | Depth Elective - 1 | 3 | 0 | 0 | 3.0 | 3 |
| 5 | CSE610 -- | Depth Elective - 2 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | CSS651 | Compiler Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CSS652 | Data Communication and Computer Networks Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | CSS653 | Database Management System Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS681 | Co-curricular Activities - VI (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 1 | 9 | 20.5 | 25 |
| Semester - VII | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | MSC731 | Principles of Management | 3 | 0 | 0 | 3.0 | 3 |
| 2 | CSE710 -- | Depth Elective – 3 | 3 | 0 | 0 | 3.0 | 3 |
| 3 | CSE710 -- | Depth Elective - 4 | 3 | 0 | 0 | 3.0 | 3 |
| 4 | CSE710 -- | Depth Elective - 5 | 3 | 0 | 0 | 3.0 | 3 |
| 5 | YYO74* | Open Elective - 3 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | CSS751 | Software Engineering Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CSS752 | Modelling and Simulation Laboratory | 0 | 1 | 3 | 2.5 | 4 |
| 8 | CSS753 | Vocational Training / Summer Internship and Seminar | 0 | 0 | 2 | 1.0 | 2 |
| 9 | CSS754 | Project - I | 0 | 0 | 3 | 1.0 | 3 |
| | | TOTAL | 15 | 1 | 11 | 21.0 | 27 |
| Semester - VIII | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | CSE810 -- | Depth Elective - 6 | 3 | 0 | 0 | 3.0 | 3 |
| 2 | YYO84* | Open Elective - 4 | 3 | 0 | 0 | 3.0 | 3 |
| 3 | YYO85* | Open Elective - 5 | 3 | 0 | 0 | 3.0 | 3 |
| 4 | CSS851 | Project - II | 0 | 0 | 15 | 5.0 | 15 |
| 5 | CSS852 | Project Seminar | 0 | 0 | 0 | 1.5 | 0 |
| 6 | CSS853 | Viva Voce | 0 | 0 | 0 | 1.0 | 0 |
| | | TOTAL | 9 | 0 | 15 | 16.5 | 24 |

**CREDIT UNIT OF THE PROGRAM:**

| Semester | I + II | III | IV | V | VI | VII | VIII | TOTAL |
|---|---|---|---|---|---|---|---|---|
| Credit Unit | 44.0 | 22.0 | 24.5 | 20.5 | 20.5 | 21.0 | 16.5 | 169.0 |

**CURRICULUM OF 2018 ONWARD UNDERGRADUATE ADMISSION BATCH**

**ELECTRICAL ENGINEERING- B.TECH.**

| Semester - III | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | MAC331 | Mathematics - III | 3 | 1 | 0 | 4.0 | 4 |
| 2 | EEC301 | Network Analysis and Synthesis | 3 | 1 | 0 | 4.0 | 4 |
| 3 | EEC302 | Electrical and Electronics Measurements | 3 | 1 | 0 | 4.0 | 4 |
| 4 | ECC331 | Analog Electronics | 3 | 1 | 0 | 4.0 | 4 |
| 5 | PHC332 | Electromagnetic Field Theory | 3 | 0 | 0 | 3.0 | 3 |
| 6 | PHS382 | Physics Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | EES351 | Electrical and Electronics Measurements Lab | 0 | 0 | 3 | 1.5 | 3 |
| 8 | XXS381 | Co-curricular Activities - III (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 4 | 6 | 22.0 | 25 |
| **Semester - IV** | | | | | | | |
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | EEC401 | Power Systems - I | 3 | 1 | 0 | 4.0 | 4 |
| 2 | EEC402 | Electrical Machines - I | 3 | 1 | 0 | 4.0 | 4 |
| 3 | EEC403 | Digital Electronics | 3 | 1 | 0 | 4.0 | 4 |
| 4 | MEC431 | Fluid and Thermal Engineering | 3 | 0 | 0 | 3.0 | 3 |
| 5 | YYO44* | Open Elective - I | 3 | 0 | 0 | 3.0 | 3 |
| 6 | EES451 | Network Analysis and Synthesis Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | ECS481 | Analog Electronics Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | MES481 | Fluid and Thermal Engineering Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS481 | Co-curricular Activities - IV (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 3 | 9 | 22.5 | 27 |
| **Semester - V** | | | | | | | |
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | EEC501 | Electrical Machines - II | 3 | 1 | 0 | 4.0 | 4 |
| 2 | EEC502 | Control Systems | 3 | 1 | 0 | 4.0 | 4 |
| 3 | EEC503 | Power Systems - II | 3 | 1 | 0 | 4.0 | 4 |
| 4 | EEC504 | Power Electronics | 3 | 1 | 0 | 4.0 | 4 |
| 5 | YYO54* | Open Elective - 2 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | ECS581 | Digital Electronics Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | EES551 | Control Systems Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | EES552 | Electrical Machines Laboratory - I | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS581 | Co-curricular Activities - V (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 4 | 9 | 23.5 | 28 |

| Semester - VI | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | HSC631 | Economics and Management Accountancy | 3 | 0 | 0 | 3.0 | 3 |
| 2 | EEC601 | Advanced Power Systems | 3 | 1 | 0 | 4.0 | 4 |
| 3 | EEC602 | Microprocessor and Microcontroller | 3 | 1 | 0 | 4.0 | 4 |
| 4 | EEE610 -- | Depth Elective - 1 | 3 | 0 | 0 | 3.0 | 3 |
| 5 | EEE610 -- | Depth Elective - 2 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | EES651 | Electrical Machines - II Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | EES652 | Power Electronics Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | EES653 | Power System Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS681 | Co-curricular Activities - VI (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 2 | 9 | 21.5 | 26 |
| Semester - VII | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | MSC731 | Principles of Management | 3 | 0 | 0 | 3.0 | 3 |
| 2 | EEE710 -- | Depth Elective - 3 | 3 | 0 | 0 | 3.0 | 3 |
| 3 | EEE710 -- | Depth Elective - 4 | 3 | 0 | 0 | 3.0 | 3 |
| 4 | EEE710 -- | Depth Elective - 5 | 3 | 0 | 0 | 3.0 | 3 |
| 5 | YYO74* | Open Elective - 3 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | EES751 | Microprocessor and Microcontroller Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | EES752 | Advanced Power System Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | EES753 | Electrical machine Design Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | EES754 | Vocational Training / Summer Internship and Seminar | 0 | 0 | 2 | 1.0 | 2 |
| 10 | EES755 | Project - I | 0 | 0 | 3 | 1.0 | 3 |
| | | TOTAL | 15 | 0 | 14 | 21.5 | 29 |
| Semester - VIII | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | EEE810 -- | Depth Elective - 6 | 3 | 0 | 0 | 3.0 | 3 |
| 2 | YYO84* | Open Elective - 4 | 3 | 0 | 0 | 3.0 | 3 |
| 3 | YYO85* | Open Elective - 5 | 3 | 0 | 0 | 3.0 | 3 |
| 4 | EES851 | Project - II | 0 | 0 | 15 | 5.0 | 15 |
| 5 | EES852 | Project Seminar | 0 | 0 | 0 | 1.0 | 0 |
| 6 | EES853 | Viva Voce | 0 | 0 | 0 | 1.0 | 0 |
| | | TOTAL | 9 | 0 | 15 | 16.0 | 24 |

**CREDIT UNIT OF THE PROGRAM:**

| Semester | I + II | III | IV | V | VI | VII | VIII | TOTAL |
|---|---|---|---|---|---|---|---|---|
| Credit Unit | 44.0 | 22.0 | 22.5 | 23.5 | 21.5 | 21.5 | 16.0 | 171.0 |

**CURRICULUM OF 2018 ONWARD UNDERGRADUATE ADMISSION BATCH**

**ELECTRONICS AND COMMUNICATION ENGINEERING- B.TECH.**

| Semester - III | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | MAC331 | Mathematics - III | 3 | 1 | 0 | 4.0 | 4 |
| 2 | ECC301 | Network Analysis and Synthesis | 3 | 1 | 0 | 4.0 | 4 |
| 3 | ECC302 | Electronic Devices and Circuits- I | 3 | 1 | 0 | 4.0 | 4 |
| 4 | ECC303 | Signals and Systems | 3 | 0 | 0 | 3.0 | 3 |
| 5 | PHC331 | Physics of Semiconductor Devices | 3 | 0 | 0 | 3.0 | 3 |
| 6 | PHS381 | Semiconductor Devices Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | ECS351 | Electronic Devices and Circuits Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | ECS352 | Network Analysis and Synthesis Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | XXS381 | Co-curricular Activities - III (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 3 | 9 | 22.5 | 27 |
| **Semester - IV** | | | | | | | |
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | ECC401 | Analog Communication | 3 | 1 | 0 | 4.0 | 4 |
| 2 | ECC402 | Digital Circuits and Systems | 3 | 1 | 0 | 4.0 | 4 |
| 3 | ECC403 | Electromagnetic Theory and Transmission Lines | 3 | 1 | 0 | 4.0 | 4 |
| 4 | EEC431 | Control Systems | 3 | 0 | 0 | 3.0 | 3 |
| 5 | YYO44* | Open Elective - I | 3 | 0 | 0 | 3.0 | 3 |
| 6 | ECS451 | Analog Communication Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | ECS452 | Digital Circuits and Systems Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | EES481 | Control Systems Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS481 | Co-curricular Activities - IV (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 3 | 9 | 22.5 | 26 |
| **Semester - V** | | | | | | | |
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | ECC501 | Digital Communication | 3 | 1 | 0 | 4.0 | 4 |
| 2 | ECC502 | Microwave Engineering | 2 | 1 | 0 | 3.0 | 3 |
| 3 | ECC503 | Microprocessors and Microcontrollers | 3 | 1 | 0 | 4.0 | 4 |
| 4 | ECC504 | Electronic Devices and Circuits-II | 3 | 1 | 0 | 4.0 | 4 |
| 5 | YYO54* | Open Elective - 2 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | ECS551 | Digital Communication Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | ECS552 | Microwave Engineering Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | ECS553 | Microprocessors and Microcontrollers Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS581 | Co-curricular Activities - V (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 4 | 9 | 22.5 | 27 |

| Semester - VI | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | HSC631 | Economics and Management Accountancy | 3 | 0 | 0 | 3.0 | 3 |
| 2 | ECC601 | Antenna and Wave Propagation | 3 | 0 | 0 | 3.0 | 3 |
| 3 | ECC602 | VLSI Design | 3 | 0 | 0 | 3.0 | 3 |
| 4 | ECC603 | Digital Signal Processing | 3 | 1 | 0 | 4.0 | 4 |
| 5 | ECE611 -- | Depth Elective - 1 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | ECE611 -- | Depth Elective - 2 | 3 | 0 | 0 | 3.0 | 3 |
| 7 | ECS651 | Antenna and Wave Propagation Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | ECS652 | VLSI Design Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | ECS653 | Digital Signal Processing Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 10 | XXS681 | Co-curricular Activities - VI (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 18 | 1 | 9 | 23.5 | 28 |
| **Semester - VII** | | | | | | | |
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | MSC731 | Principles of Management | 3 | 0 | 0 | 3.0 | 3 |
| 2 | ECE711 -- | Depth Elective - 3 | 3 | 0 | 0 | 3.0 | 3 |
| 3 | ECE711 -- | Depth Elective - 4 | 3 | 0 | 0 | 3.0 | 3 |
| 4 | ECE711 -- | Depth Elective - 5 | 3 | 0 | 0 | 3.0 | 3 |
| 5 | YYO74* | Open Elective - 3 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | ECS751 | Computer Aided Design Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | ECS752 | Electronic System Design Laboratory | 0 | 0 | 4 | 2.0 | 4 |
| 8 | ECS753 | Advanced Communication Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | ECS754 | Vocational Training / Summer Internship and Seminar | 0 | 0 | 2 | 1.0 | 2 |
| 10 | ECS755 | Project - I | 0 | 0 | 3 | 1.0 | 3 |
| | | TOTAL | 15 | 0 | 15 | 22.0 | 30 |
| **Semester - VIII** | | | | | | | |
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | ECE811 -- | Depth Elective - 6 | 3 | 0 | 0 | 3.0 | 3 |
| 2 | YYO84* | Open Elective - 4 | 3 | 0 | 0 | 3.0 | 3 |
| 3 | YYO85* | Open Elective - 5 | 3 | 0 | 0 | 3.0 | 3 |
| 4 | ECS851 | Project - II | 0 | 0 | 15 | 5.0 | 15 |
| 5 | ECS852 | Project Seminar | 0 | 0 | 0 | 1.0 | 0 |
| 6 | ECS853 | Comprehensive Viva Voce | 0 | 0 | 0 | 1.0 | 0 |
| | | TOTAL | 9 | 0 | 15 | 16.0 | 24 |

**CREDIT UNIT OF THE PROGRAM:**

| Semester | I + II | III | IV | V | VI | VII | VIII | TOTAL |
|---|---|---|---|---|---|---|---|---|
| Credit Unit | 44.0 | 22.5 | 22.5 | 22.5 | 23.5 | 22.0 | 16.0 | 173.0 |

**CURRICULUM OF 2018 ONWARD UNDERGRADUATE ADMISSION BATCH**

**MECHANICAL ENGINEERING- B.TECH.**

| Semester - III | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | MAC331 | Mathematics - III | 3 | 1 | 0 | 4.0 | 4 |
| 2 | MEC301 | Solid Mechanics | 3 | 1 | 0 | 4.0 | 4 |
| 3 | MEC302 | Theory of Machines and Mechanisms | 3 | 1 | 0 | 4.0 | 4 |
| 4 | MEC303 | Fluid Mechanics | 3 | 1 | 0 | 4.0 | 4 |
| 5 | MEC304 | Engineering Thermodynamics | 3 | 0 | 0 | 3.0 | 3 |
| 6 | PHC333 | Physics of Engineering Materials | 3 | 0 | 0 | 3.0 | 3 |
| 7 | PHS383 | Physics of Engineering Materials Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | XXS381 | Co-curricular Activities - III (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 18 | 4 | 3 | 23.5 | 25 |
| **Semester - IV** | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | MEC401 | Design of Machine Element | 3 | 1 | 0 | 4.0 | 4 |
| 2 | MEC402 | Casting, Forming and Welding | 3 | 1 | 0 | 4.0 | 4 |
| 3 | MEC403 | Heat and Mass Transfer | 3 | 0 | 0 | 3.0 | 3 |
| 4 | EEC432 | Electrical Machines | 3 | 0 | 0 | 3.0 | 3 |
| 5 | YYO44* | Open Elective - I | 3 | 0 | 0 | 3.0 | 3 |
| 6 | MES451 | Solid Mechanics Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | MES452 | Fluid Mechanics Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | MES453 | Mechanism Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | EES482 | Electrical Machines Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 10 | XXS481 | Co-curricular Activities - IV (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 2 | 12 | 23.0 | 29 |
| **Semester - V** | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | MEC501 | Machining and Machine Tools | 3 | 1 | 0 | 4.0 | 4 |
| 2 | MEC502 | IC Engine and Gas Turbines | 3 | 0 | 0 | 3.0 | 3 |
| 3 | MEC503 | Machine Design | 3 | 1 | 0 | 4.0 | 4 |
| 4 | MEC504 | Dynamics of Machines | 2 | 1 | 0 | 3.0 | 3 |
| 5 | YYO54* | Open Elective - 2 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | MES551 | Design and Dynamics Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | MES552 | Heat Transfer Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | MES553 | CAD/CAM Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | WSS581 | Workshop Practice- II | 0 | 0 | 3 | 1.5 | 3 |
| 10 | XXS581 | Co-curricular Activities - V (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 14 | 3 | 12 | 23.0 | 29 |

| Semester - VI | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | HSC631 | Economics and Management Accountancy | 3 | 0 | 0 | 3.0 | 3 |
| 2 | MEC601 | Power Plant Engineering | 2 | 1 | 0 | 3.0 | 3 |
| 3 | MEC602 | Industrial Engineering and Measurement | 3 | 0 | 0 | 3.0 | 3 |
| 4 | MEE610 -- | Depth Elective - 1 | 3 | 0 | 0 | 3.0 | 3 |
| 5 | MEE610 -- | Depth Elective - 2 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | MES651 | Engineering Measurement Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | MES652 | Power Generation Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | MES653 | Machine Design Sessional - I | 0 | 0 | 3 | 1.5 | 3 |
| 9 | MES654 | Manufacturing Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 10 | XXS681 | Co-curricular Activities - VI (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 14 | 1 | 12 | 21.0 | 27 |
| Semester - VII | | | | | | | |
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | MSC731 | Principles of Management | 3 | 0 | 0 | 3.0 | 3 |
| 2 | MEE710 -- | Depth Elective - 3 | 3 | 0 | 0 | 3.0 | 3 |
| 3 | MEE710 -- | Depth Elective - 4 | 3 | 0 | 0 | 3.0 | 3 |
| 4 | MEE710 -- | Depth Elective - 5 | 3 | 0 | 0 | 3.0 | 3 |
| 5 | YYO74* | Open Elective - 3 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | MES751 | Hydraulic Machine Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | MES752 | Machine Design Sessional - II | 0 | 0 | 3 | 1.5 | 3 |
| 8 | MES753 | Vocational Training / Summer Internship and Seminar | 0 | 0 | 3 | 1.5 | 3 |
| 9 | MES754 | Project - I | 0 | 0 | 3 | 1.0 | 4 |
| | | TOTAL | 15 | 0 | 12 | 20.5 | 27 |
| Semester - VIII | | | | | | | |
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | MEE810 -- | Depth Elective - 6 | 3 | 0 | 0 | 3.0 | 3 |
| 2 | YYO84* | Open Elective - 4 | 3 | 0 | 0 | 3.0 | 3 |
| 3 | YYO85* | Open Elective - 5 | 3 | 0 | 0 | 3.0 | 3 |
| 4 | MES851 | Project - II | 0 | 0 | 15 | 5.0 | 15 |
| 5 | MES852 | Project Seminar | 0 | 0 | 0 | 1.0 | 0 |
| 6 | MES853 | Viva Voce | 0 | 0 | 0 | 1.0 | 0 |
| | | TOTAL | 9 | 0 | 15 | 16.0 | 24 |

**CREDIT UNIT OF THE PROGRAM:**

| Semester | I + II | III | IV | V | VI | VII | VIII | TOTAL |
|---|---|---|---|---|---|---|---|---|
| Credit Unit | 44.0 | 23.5 | 23.0 | 23.0 | 21.0 | 20.5 | 16.0 | 171.0 |

**CURRICULUM OF 2018 ONWARD UNDERGRADUATE ADMISSION BATCH**

**METALLURGICAL AND MATERIALS ENGINEERING- B.TECH.**

| Semester - III | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | MAC331 | Mathematics- III | 3 | 1 | 0 | 4.0 | 4 |
| 2 | MMC301 | Metallurgical Thermodynamics and Kinetics | 3 | 1 | 0 | 4.0 | 4 |
| 3 | MMC302 | Introduction of Metallurgy and Materials | 3 | 1 | 0 | 4.0 | 4 |
| 4 | MMC303 | Non - Ferrous Process Metallurgy | 3 | 1 | 0 | 4.0 | 4 |
| 5 | ESC332 | Economic Geology | 3 | 0 | 0 | 3.0 | 3 |
| 6 | ESS382 | Economic Geology Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | MMS351 | Metallurgical Thermodynamics and Kinetics Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | XXS381 | Co-curricular Activities - III (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 4 | 6 | 22.0 | 25 |
| **Semester - IV** | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | MMC401 | Transport Phenomena in Metallurgical Processes | 3 | 1 | 0 | 4.0 | 4 |
| 2 | MMC402 | Phase Transformation and Phase Equilibria | 3 | 1 | 0 | 4.0 | 4 |
| 3 | MMC403 | Materials Characterization | 3 | 1 | 0 | 4.0 | 4 |
| 4 | YYO44* | Open Elective - I | 3 | 0 | 0 | 3.0 | 3 |
| 5 | CSC433 | Data Structures | 3 | 0 | 0 | 3.0 | 3 |
| 6 | CSC483 | Data Structures Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | MMS451 | Transport Phenomena Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | MMS452 | Phase Transformation and Phase Equilibria Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS481 | Co-curricular Activities - IV (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 3 | 9 | 22.5 | 27 |
| **Semester - V** | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | MMC501 | Manufacturing Processes | 3 | 1 | 0 | 4.0 | 4 |
| 2 | MMC502 | Heat Treatment of Materials | 3 | 1 | 0 | 4.0 | 4 |
| 3 | MMC503 | Fundamentals of Plastic Deformation and Strengthening of Materials | 3 | 1 | 0 | 4.0 | 4 |
| 4 | MMC504 | Iron Making | 3 | 1 | 0 | 4.0 | 4 |
| 5 | YYO54* | Open Elective - 2 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | MMS551 | Manufacturing Processes Laboratory - I | 0 | 0 | 3 | 1.5 | 3 |
| 7 | MMS552 | Heat Treatment of Materials Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | MMS553 | Plastic Deformation and Strengthening of Materials Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS581 | Co-curricular Activities - V (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 4 | 9 | 23.5 | 28 |

| Semester - VI | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | HSC631 | Economics and Management Accountancy | 3 | 0 | 0 | 3.0 | 3 |
| 2 | MMC601 | Steel Making | 3 | 1 | 0 | 4.0 | 4 |
| 3 | MMC602 | Mechanical Working of Materials | 3 | 0 | 0 | 3.0 | 3 |
| 4 | MME610 -- | Depth Elective - 1 | 3 | 0 | 0 | 3.0 | 3 |
| 5 | MME610 -- | Depth Elective - 2 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | MMS651 | Mineral Beneficiation Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | MMS652 | Mechanical Working of Materials Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | MMS653 | Material Characterization Laboratory -I | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS681 | Co-curricular Activities - VI (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 1 | 9 | 20.5 | 25 |
| Semester - VII | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | MSC731 | Principles of Management | 3 | 0 | 0 | 3.0 | 3 |
| 2 | MME710 -- | Depth Elective - 3 | 3 | 0 | 0 | 3.0 | 3 |
| 3 | MME710 -- | Depth Elective - 4 | 3 | 0 | 0 | 3.0 | 3 |
| 4 | MME710 -- | Depth Elective - 5 | 3 | 0 | 0 | 3.0 | 3 |
| 5 | YYO74* | Open Elective - 3 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | MMS751 | Manufacturing Processes Laboratory - II | 0 | 0 | 3 | 1.5 | 3 |
| 7 | MMS752 | Material Characterization Laboratory -II | 0 | 0 | 3 | 1.5 | 3 |
| 8 | MMS753 | Ferrous Process Metallurgy Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | MMS754 | Vocational Training / Summer Internship and Seminar | 0 | 0 | 2 | 1.0 | 2 |
| 10 | MMS755 | Project - I | 0 | 0 | 3 | 1.0 | 3 |
| | | TOTAL | 15 | 0 | 14 | 21.5 | 29 |
| Semester - VIII | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | MME810 -- | Depth Elective - 6 | 3 | 0 | 0 | 3.0 | 3 |
| 2 | YYO84* | Open Elective - 4 | 3 | 0 | 0 | 3.0 | 3 |
| 3 | YYO85* | Open Elective - 5 | 3 | 0 | 0 | 3.0 | 3 |
| 4 | MMS851 | Project - II | 0 | 0 | 15 | 5.0 | 15 |
| 5 | MMS852 | Project Seminar | 0 | 0 | 0 | 1.0 | 0 |
| 6 | MMS853 | Viva Voce | 0 | 0 | 0 | 1.0 | 0 |
| | | TOTAL | 9 | 0 | 15 | 16.0 | 24 |

**CREDIT UNIT OF THE PROGRAM:**

| Semester | I + II | III | IV | V | VI | VII | VIII | TOTAL |
|---|---|---|---|---|---|---|---|---|
| Credit Unit | 44.0 | 22.0 | 22.5 | 23.5 | 20.5 | 21.5 | 16.0 | 170.0 |

**CURRICULUM OF 2018 ONWARD UNDERGRADUATE ADMISSION BATCH**

**BIOTECHNOLOGY- DUAL DEGREE (B.TECH.-M.TECH.)**

| Semester - III | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | MAC331 | Mathematics - III | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CHC331 | Process Calculation and Thermodynamics | 3 | 1 | 0 | 4.0 | 4 |
| 3 | BTC301 | Cell biology and Genetics | 3 | 1 | 0 | 4.0 | 4 |
| 4 | BTC302 | Microbiology and Bioprocess Technology | 3 | 1 | 0 | 4.0 | 4 |
| 5 | BTC303 | Biochemistry and Enzyme Technology | 3 | 0 | 0 | 3.0 | 3 |
| 6 | BTS352 | Biochemistry Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | BTS 351 | Microbiology Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | XXS381 | Co-curricular Activities - III (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 4 | 6 | 22.0 | 25 |
| **Semester - IV** | | | | | | | |
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | BTC401 | Molecular Biology and Recombinant DNA Technology | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CHC431 | Unit Operation of Chemical Engineering- I | 3 | 1 | 0 | 4.0 | 4 |
| | | | | | | | |
| 3 | BTC402 | Immunology | 3 | 1 | 0 | 4.0 | 4 |
| 4 | CSC431 | Programming and Data Structure | 3 | 0 | 0 | 3.0 | 3 |
| 5 | YYO44* | Open Elective - 1 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | BTS451 | Cell Biology and Genetics Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CHS481 | Unit Operations of Chemical Engineering-I Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | CSS481 | Programming and Data Structure Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS481 | Co-curricular Activities - IV (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 3 | 9 | 22.5 | 27 |
| **Semester - V** | | | | | | | |
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | BTC501 | Biochemical Reaction Engineering and Bioreactor Design | 3 | 1 | 0 | 4.0 | 4 |
| 2 | BTC502 | Cell and Tissue Culture | 3 | 1 | 0 | 4.0 | 4 |
| 3 | BTC503 | Bioseparation and Biochemical Analysis | 3 | 1 | 0 | 4.0 | 4 |
| 4 | CHC531 | Unit Operations of Chemical Engineering-II | 3 | 1 | 0 | 4.0 | 4 |
| 5 | YYO54* | Open Elective - 2 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | BTS551 | Immunology Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | BTS552 | Bioprocess Technology Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | CHS581 | Unit Operations of Chemical Engineering Laboratory- II | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS581 | Co-curricular Activities - V (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 4 | 9 | 23.5 | 28 |

| Semester - VI | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | HSC631 | Economics and Management Accountancy | 3 | 0 | 0 | 3.0 | 3 |
| 2 | BTC601 | Bioinformatics | 2 | 1 | 0 | 3.0 | 3 |
| 3 | CSC631 | Database Management System | 2 | 1 | 0 | 3.0 | 3 |
| 4 | CHC631 | Process Control and Instrumentation | 2 | 1 | 0 | 3.0 | 3 |
| 5 | BTE610 -- | Depth Elective - 1 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | BTE610 -- | Depth Elective - 2 | 3 | 0 | 0 | 3.0 | 3 |
| 7 | BTS651 | Molecular Biology and rDNA Technology Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | BTS652 | Bioinformatics Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | CSS681 | Database Management System Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 10 | XXS681 | Co-curricular Activities - VI (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 3 | 9 | 22.5 | 27 |
| **Semester - VII** | | | | | | | |
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | MSC731 | Principles of Management | 3 | 0 | 0 | 3.0 | 3 |
| 2 | BTE710 -- | Depth Elective - 3 | 3 | 0 | 0 | 3.0 | 3 |
| 3 | BTE710 -- | Depth Elective - 4 | 3 | 0 | 0 | 3.0 | 3 |
| 4 | BTE710 -- | Depth Elective - 5 | 3 | 0 | 0 | 3.0 | 3 |
| 5 | YYO74* | Open Elective - 4 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | BT1001 | Advanced Bioprocess Engineering | 3 | 1 | 0 | 4.0 | 4 |
| 7 | BTS751 | Bioseparation and Biochemical Analysis Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | BTS752 | Cell and Tissue Culture Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | BTS753 | Biochemical Reaction Engineering Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 10 | BTS754 | Vocational Training / Summer Internship and Seminar | 0 | 0 | 2 | 1.0 | 2 |
| 11 | BTS755 | Project – I | 0 | 0 | 3 | 1.0 | 3 |
| | | TOTAL | 18 | 1 | 14 | 25.5 | 33 |
| **Semester - VIII** | | | | | | | |
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | BTE810 -- | Depth Elective - 6 | 3 | 0 | 0 | 3.0 | 3 |
| 2 | YYO84* | Open Elective - 4 | 3 | 0 | 0 | 3.0 | 3 |
| 3 | YYO85* | Open Elective - 5 | 3 | 0 | 0 | 3.0 | 3 |
| 4 | BT2002 | Genomics , Proteomics and Bioinformatics | 3 | 1 | 0 | 4.0 | 4 |
| 5 | BT2003 | Industrial Production of Biopharamceutical Product | 3 | 1 | 0 | 4.0 | 4 |
| 6 | BT2053 | Structural Bioinformatics Laboratory | 0 | 0 | 3 | 2.0 | 3 |
| 7 | BTS855 | Project – II | 0 | 0 | 6 | 2.0 | 6 |
| | | TOTAL | 15 | 2 | 9 | 21.0 | 31 |

| Semester - IX | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | BT9027 | Advanced rDNA Technology & Cellular Biotechnology | 3 | 1 | 0 | 4.0 | 4 |
| 2 | BT1051 | Advanced Bioprocess Engineering Laboratory | 0 | 0 | 3 | 2.0 | 3 |
| 3 | BT3055 | Major Project-I | 0 | 0 | 22 | 11.0 | 22 |
| 4 | BT3056 | Major Project Seminar-I | 0 | 0 | 0 | 2.0 | 0 |
| | | TOTAL | 8 | 0 | 22 | 19.0 | 29 |
| Semester - X | | | | | | | |
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | BT4055 | Major Project-II | 0 | 0 | 22 | 11.0 | 22 |
| 2 | BT4056 | Major Project Seminar-II and Viva Voce | 0 | 0 | 0 | 3.0 | 0 |
| 3 | BT4057 | Comprehensive Viva Voce | 0 | 0 | 0 | 1.0 | 0 |
| | | TOTAL | 4 | 0 | 22 | 15.0 | 22 |

**CREDIT UNIT OF THE PROGRAM:**

| Semester | I + II | III | IV | V | VI | VII | VIII | IX | X | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| Credit Unit | 38.0 | 22.0 | 22.5 | 23.5 | 22.5 | 25.5 | 21.0 | 19.0 | 15.0 | 209.0 |

**CURRICULUM OF 2018 ONWARD UNDERGRADUATE ADMISSION BATCH**

**CHEMICAL ENGINEERING- DUAL DEGREE (B.TECH.-M.TECH.)**

| Semester - III | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | MAC331 | Mathematics - III | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CHC301 | Process Calculations | 3 | 1 | 0 | 4.0 | 4 |
| 3 | CHC302 | Chemical Engineering Thermodynamics | 3 | 1 | 0 | 4.0 | 4 |
| 4 | CHC303 | Fluid Mechanics | 3 | 1 | 0 | 4.0 | 4 |
| 5 | CYC331 | Chemistry - II | 3 | 0 | 0 | 3.0 | 3 |
| 6 | CYS381 | Chemistry Laboratory- II | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CHS351 | Chemical Engineering Computing Laboratory- I | 0 | 0 | 3 | 1.5 | 3 |
| 8 | XXS381 | Co-curricular Activities - III (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 4 | 6 | 22.0 | 25 |
| Semester - IV | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | CHC401 | Heat Transfer | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CHC402 | Mechanical Operation | 3 | 1 | 0 | 4.0 | 4 |
| 3 | CHC403 | Mass Transfer- I | 3 | 1 | 0 | 4.0 | 4 |
| 4 | MEC432 | Mechanical Design of Equipment and Components | 3 | 0 | 0 | 3.0 | 3 |
| 5 | YYO44* | Open Elective - I | 3 | 0 | 0 | 3.0 | 3 |
| 6 | CHS451 | Fluid Mechanics Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CHS452 | Process Equipment Design- I Sessional | 0 | 0 | 3 | 1.5 | 3 |
| 8 | WSS481 | Workshop Practice- II | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS481 | Co-curricular Activities - IV (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 3 | 9 | 22.5 | 27 |
| Semester - V | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | CHC501 | Chemical Reaction Engineering | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CHC502 | Mass Transfer- II | 3 | 1 | 0 | 4.0 | 4 |
| 3 | CHC503 | Chemical Process Technology | 3 | 1 | 0 | 4.0 | 4 |
| 4 | CHC504 | Process Control and Instrumentation | 3 | 1 | 0 | 4.0 | 4 |
| 5 | YYO54* | Open Elective - 2 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | CHS551 | Heat Transfer Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CHS552 | Mechanical Operations Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | CHS553 | Process Equipment Design- II Sessional | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS581 | Co-curricular Activities - V (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 4 | 9 | 23.5 | 28 |

| Semester - VI | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | HSC631 | Economics and Management Accountancy | 3 | 0 | 0 | 3.0 | 3 |
| 2 | CHC601 | Transport Phenomena | 3 | 1 | 0 | 4.0 | 4 |
| 3 | CHC602 | Petroleum Refining and Petrochemicals | 3 | 1 | 0 | 4.0 | 4 |
| 4 | CHC603 | Process Modelling and Simulation | 3 | 0 | 0 | 3.0 | 3 |
| 5 | CH610-- | Depth Elective - 1 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | CHS651 | Fuel Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CHS652 | Reaction Engineering Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | CHS653 | Mass Transfer Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS681 | Co-curricular Activities - VI (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 2 | 9 | 21.5 | 26 |
| Semester - VII | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | MSC731 | Principles of Management | 3 | 0 | 0 | 3.0 | 3 |
| 2 | CHE710 -- | Depth Elective - 2 | 3 | 0 | 0 | 3.0 | 3 |
| 3 | CHE710 -- | Depth Elective - 3 | 3 | 0 | 0 | 3.0 | 3 |
| 4 | CHE710 -- | Depth Elective - 4 | 3 | 0 | 0 | 3.0 | 3 |
| 5 | YYO74* | Open Elective - 3 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | CH1001 | Advanced Fluid Dynamics | 3 | 1 | 0 | 4.0 | 4 |
| 7 | CHS751 | Process Control and Instrumentation Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | CHS752 | Chemical Engineering Computing Laboratory- II | 0 | 0 | 3 | 1.5 | 3 |
| 9 | CHS753 | Computer Aided Process Equipment Design Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 10 | CHS754 | Vocational Training / Summer Internship and Seminar | 0 | 0 | 2 | 1.0 | 2 |
| | | TOTAL | 18 | 1 | 11 | 24.5 | 30 |
| Semester - VIII | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | CHE810 -- | Depth Elective - 5 | 3 | 0 | 0 | 3.0 | 3 |
| 2 | YYO84* | Open Elective - 4 | 3 | 0 | 0 | 3.0 | 3 |
| 3 | YYO85* | Open Elective - 5 | 3 | 0 | 0 | 3.0 | 3 |
| 4 | CH2001 | Advanced Process Dynamics and Control | 3 | 1 | 0 | 4.0 | 4 |
| 5 | CH2002 | Advanced Mass Transfer | 3 | 1 | 0 | 4.0 | 4 |
| 6 | CH2003 | Advanced Heat Transfer | 3 | 1 | 0 | 4.0 | 4 |
| 7 | CH2053 | Project I | 0 | 0 | 9 | 3.0 | 9 |
| | | TOTAL | 18 | 3 | 9 | 24.0 | 30 |
| Semester - IX | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | CH1002 | Environmental Engineering | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CH1003 | Advanced Process Modelling and Simulation | 3 | 1 | 0 | 4.0 | 4 |
| 3 | CH3051 | Project-II | 0 | 0 | 22 | 11.0 | 22 |
| 4 | CH3052 | Project Seminar-I | 0 | 0 | 0 | 2.0 | 0 |
| | | TOTAL | 6 | 2 | 22 | 21.0 | 30 |
| Semester - X | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | CH4051 | Project-III | 0 | 0 | 22 | 11.0 | 22 |
| 2 | CH4052 | Project Seminar-II and Viva Voce | 0 | 0 | 0 | 3.0 | 0 |
| 3 | CH4053 | Grand Viva Voce | 0 | 0 | 0 | 1.0 | 0 |
| | | TOTAL | 4 | 0 | 22 | 15.0 | 22 |

**CREDIT UNIT OF THE DUAL DEGREE PROGRAM:**

| Semester | I + II | III | IV | V | VI | VII | VIII | IX | X | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| Credit Unit | 44.0 | 22.0 | 22.5 | 23.5 | 21.5 | 24.5 | 24.0 | 21.0 | 15.0 | 218.0 |

**2018 ONWARD UNDERGRADUATE ADMISSION BATCH**

**OPEN ELECTIVE COURSE BASKETS**

**THE STUDENT CAN OPT ANY OPEN ELECTIVE SUBJECT(S) THAT ARE OFFERED IN A PARTICULAR SEMESTER, EXCEPT THE SUBJECT(S) WITH HIS/ HER OWN DEPARTMENT CODE.**

**Basket– 1 (4th Semester)**

| | |
|---|---|
| MAO441 | Discrete Mathematics |
| MAO442 | Probability and Stochastic Processes |
| PHO441 | Quantitative Biology |
| BTO441 | Food Biotechnology |
| CEO440 | Introduction to Earthquake Engineering |
| CEO441 | Elementary Civil Engineering |
| CEO442 | Experimental Methods & Analysis |
| CHO441 | Process Heat Transfer |
| CSO441 | Data Structures and Algorithms |
| CSO442 | Object Oriented Technology |
| ECO440 | Digital Systems |
| ECO441 | Communication Engineering |
| EEO440 | Fundamentals of Power Systems |
| EEO441 | Concept of Industrial Electronics |
| EEO442 | Energy Conservation, Audit and ICT & IOT Application For Monitoring |
| EEO443 | Network Theory |
| XEO441 | Brain to Mind Creation |

**Basket– 2 (5th Semester)**

| | |
|---|---|
| HSO540 | Entrepreneurship Development: Theory and Practice |
| HSO541 | Statistical Techniques for Economics |
| HSO542 | Culture and Communication |
| HSO543 | Personality Development |
| HSO544 | Soft Skills |
| MAO541 | Mathematical Methods for Engineers |
| MAO542 | Linear Algebra |
| MAO543 | Modern Algebra |
| PHO541 | Thin Film Technology |
| ESO541 | Groundwater Hydrology |
| BTO540 | Mineral Biotechnology |
| CEO540 | Numerical Methods in Engineering |
| CEO541 | Engineering Computing and Simulation with Scilab |
| CEO542 | Introduction to Random Vibrations |
| CHO542 | Fuels & Combustion |
| CHO543 | Industrial Water Treatment |
| CSO541 | Fundamentals of Algorithms |
| CSO542 | Database Management System |
| CSO543 | Computer Organization |
| CSO544 | Operating Systems |
| ECO540 | Mechatronics |
| ECO541 | Probability Theory for Engineering Application |
| ECO542 | Artificial Intelligence and Soft Computing |
| EEO540 | Measurement and Instrumentation |
| EEO541 | Fundamentals of Control Systems |
| EEO542 | Power System Analysis and Design |
| MEO541 | Experimental methods in Engineering |
| MMO541 | Basic Manufacturing Process |

**Basket– 3 (7th Semester)**

| | |
|---|---|
| HSO740 | Indian Writings in English |
| HSO741 | Development Economics and Sustainable Development |
| CYO741 | Analytical and environmental chemistry |
| PHO741 | Nuclear Reactor Technology |
| BTO740 | Genetic Engineering |
| CEO740 | Mechanics of Composite |
| CEO741 | Optimization in Engineering Design |
| CEO742 | Theory of Elasticity and Plasticity |
| CHO741 | Non-linear Dynamics |
| CSO741 | Software Engineering |
| CSO742 | Multimedia Technologies |
| CSO743 | Computer Networks |
| ECO740 | Biomedical Instrumentation |
| ECO741 | Embedded Systems |
| EEO740 | Concept of Electrical Machines & Drives |
| EEO741 | Biomedical Instrumentation |
| EEO742 | Renewable Energy |
| MEO741 | Nonconventional Energy Systems |
| MEO742 | Robotics |
| XEO741 | Human Resource Management |
| XEO742 | Medical Instrumentation and Assistive Technology |

**Basket– 4 (8th Semester)**

| | |
|---|---|
| MSO841 | Marketing Research and Analytics |
| PHO841 | Quantum Physics |
| BTO840 | Industrial Biotechnology |
| CEO840 | Finite Element Analysis and Applications |
| CEO841 | Disaster Management and Mitigation |
| CEO842 | Experimental Methods in Engineering |
| CHO841 | Bioengineering & Industrial applications |
| CSO841 | CAD for VLSI |
| CSO842 | Internet and Web Technologies |
| CSO843 | Soft Computing Techniques |
| CSO844 | Compiler Design |
| ECO840 | Structronics |
| ECO841 | Signal Processing |
| ECO842 | Introduction to VLSI |
| EEO840 | Concept of Electrical Machines and Drives |
| EEO841 | Biomedical Instrumentation |
| EEO842 | Renewable Energy |
| EEO843 | Digital Image Processing |
| MEO841 | Nonlinear Dynamical Systems |
| MMO841 | Material Science |

**Basket– 5 (8th Semester)**

| | |
|---|---|
| HSO850 | International Economics and Globalization |
| HSO851 | Literature and Cinema |
| HSO852 | Classics of Literature |
| MSO851 | Investment Management and Stock Market |
| CYO851 | Spectroscopic methods of chemical analysis |
| PHO851 | Fiber-Optics Communication |
| PHO852 | Optical Instrumentation |
| MAO851 | Operations Research |
| MAO852 | Advanced Numerical Analysis |
| MAO853 | Optimization Techniques |
| BTO850 | Medical Biotechnology |
| CEO850 | Watershed Planning and Management |
| CEO851 | Elementary Structural Design |
| CEO852 | Reliability Engineering |
| CHO851 | Energy, Environment & Sustainability |
| CSO851 | Machine Learning |
| CSO852 | Data Analytics |
| CSO853 | Distributed Computing |
| CSO854 | Game Theory and its Applications |
| CSO855 | Information Security |
| CSO856 | Optical Network |
| ECO850 | Communication Network |
| ECO851 | Mobile Computing |
| ECO852 | MEMS Technology |
| EEO850 | Soft Computing Techniques |
| EEO851 | Embedded Systems and Applications |
| EEO852 | Micro-Electro-Mechanical Systems |
| MEO851 | Tribology |
| XEO851 | Leadership and Corporate Strategy |

## 2018 ONWARD UNDERGRADUATE ADMISSION BATCH

### DEPTH ELECTIVE COURSE BASKETS

**THE STUDENTS PRIMARILY WILL OPT FROM THE DEPTH ELECTIVE SUBJECT(S) THAT ARE OFFERED IN A PARTICULAR SEMESTER BY HIS/ HER OWN DEPARTMENT. HOWEVER, A STUDENT CAN OPT FOR DEPTH ELECTIVE SUBJECT(S) THAT ARE OFFERED BY OTHER DEPARTMENT IN A PARTICULAR SEMESTER, WITH THE PERMISSION/ CONSENT FROM HIS/ HER HEAD OF THE DEPARTMENT AND THE CONCERNED TEACHER OF THAT SUBJECT.**

### SIXTH SEMESTER

| | DEPARTMENT OF BIOTECHNOLOGY |
|---|---|
| BTE610 | Animal Biotechnology |
| BTE611 | Industrial Microbiology |
| BTE612 | Nutraceutical and Nutrigenomics |
| BTE613 | Human Genomics |
| BTE614 | Molecular Virology |
| BTE615 | Biometallurgy |
| BTE616 | Nanobiotechnology |
| BTE617 | Marine Biotechnology |
| BTE618 | Folding, Misfolding and Diseases |
| | |
| | DEPARTMENT OF CHEMICAL ENGINEERING |
| CHE610 | Chemical Reactor Analysis |
| CHE611 | Industrial Pollution Control and Treatment |
| CHE612 | Non-conventional Energy Engineering |
| CHE613 | Combustion Engineering |
| CHE614 | Artificial Intelligence in Chemical Industries |
| | |
| | DEPARTMENT OF CIVIL ENGINEERING |
| CEE610 | Advanced Design of Concrete Structures |
| CEE611 | Advanced Structural Analysis |
| CEE612 | Mechanics of Composite Structures |
| CEE613 | Material Technology |
| CEE614 | Applied Numerical Methods |
| CEE615 | Bridge Engineering |
| CEE620 | Analysis and Design of Pavement |
| CEE621 | Finite Element Method |
| CEE622 | Ground Improvement |
| CEE623 | Remote sensing and GIS |
| CEE624 | Traffic Engineering and Management |
| CEE625 | System Approach to Civil Engineering |

| | |
|---|---|
| | **DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING** |
| **CSE611** | **Embedded System Design** |
| **CSE612** | **System Software** |
| **CSE613** | **Internet and Web Technologies** |
| **CSE614** | **Advanced Computer Architecture** |
| **CSE615** | **Optimization Techniques** |
| **CSE616** | **Artificial Intelligence** |
| **CSE617** | **Advanced Algorithms** |
| **CSE618** | **Information Coding Theory** |
| **CSE619** | **Computer Graphics** |
| **CSE620** | **Game Theory and its Applications** |
| **CSE621** | **Digital Systems Testing** |
| **CSE622** | **Soft Computing** |
| **CSE623** | **Advanced Database Systems** |
| | |
| | **DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING** |
| **ECE610** | **Artificial Intelligence & Soft Computing** |
| **ECE611** | **Computer Organization and Architecture** |
| **ECE612** | **Advanced Digital Communication** |
| **ECE613** | **Object Oriented Programming** |
| **ECE614** | **CAD for VLSI** |
| **ECE615** | **Active Filter Design** |
| **ECE616** | **VLSI Technology** |
| **ECE617** | **Probability and Random Signal Theory** |
| **ECE618** | **Data Comm. & Computer Networks** |
| **ECE619** | **Mobile Computing** |
| **ECE620** | **Nano Electronics** |
| **ECE621** | **Measurement & Instrumentation** |
| **ECE622** | **Digital IC Design** |
| **ECE623** | **Mechatronics Systems** |
| **ECE624** | **Power Electronics** |
| **ECE625** | **Optical Communication** |
| | |
| | **DEPARTMENT OF ELECTRICAL ENGINEERING** |
| **EEE610** | **Numerical Analysis** |
| **EEE611** | **Instrumentation** |
| **EEE612** | **Modern Control Systems** |
| **EEE613** | **Special Electrical Machines** |
| **EEE614** | **Signals and Systems** |
| **EEE615** | **Advanced Power Electronics** |
| **EEE616** | **Soft Computing Theory and Applications** |
| | |
| | **DEPARTMENT OF MECHANICAL ENGINEERING** |
| **MEE610** | **Automobile Engineering** |
| **MEE611** | **Gas Dynamics and Propulsion** |
| **MEE612** | **Mechanics of Forming and Press Working** |
| **MEE613** | **Advanced Solid Mechanics** |
| **MEE614** | **Advanced Machining and CNC Machine Tools** |
| **MEE615** | **Operation Research** |
| **MEE616** | **Mechanical Equipment Design** |
| **MEE620** | **Advanced Foundry Engineering** |
| **MEE621** | **Mechanics of Composite and Functionally Graded Materials** |
| **MEE622** | **Engineering Optimization** |
| **MEE623** | **Multi-Phase Flow and Heat Transfer** |
| **MEE624** | **Tribology** |
| **MEE625** | **Computer Aided Design and Manufacturing** |

| | DEPARTMENT OF METALLURGY AND MATERIALS ENGINEERING |
|---|---|
| MME610 | Engineering Materials |
| MME611 | Electronic and Thermal Properties of Materials |
| MME612 | Alternative Routes of Iron Making |
| MME613 | Production of Ferroalloys |
| MME614 | Nano Science and Technology |
| MME615 | Ceramic Technology |
| MME616 | Solidification Phenomena |
| MME617 | Metal Joining Processes |

**SEVENTH SEMESTER**

| | DEPARTMENT OF BIOTECHNOLOGY |
|---|---|
| BTE710 | Molecular Plant Pathology |
| BTE711 | Cancer Biology & Cell Signaling |
| BTE712 | Food Biotechnology |
| BTE713 | Biopharmaceutical Process Design |
| BTE714 | Bioenergy |
| BTE715 | Project Engineering for Biotechnology |
| BTE716 | Structural Biology |
| BTE717 | Environmental Biotechnology |
| BTE718 | Proteomics and Protein Engineering |
| BTE719 | Molecular Modelling & Drug Design |
| BTE720 | Nanotherapeutics |
| BTE721 | Biomaterials |
| BTE722 | Vaccine Technology |
| BTE723 | Stem Cell Biology |
| | |
| | DEPARTMENT OF CHEMICAL ENGINEERING |
| CHE710 | Energy Sources & Utilization |
| CHE711 | Bioprocess and Bioreactor Engineering |
| CHE712 | Process Engineering |
| CHE713 | Chemical Plant Design and Economics |
| CHE714 | Process Safety in Chemical Industries |
| CHE715 | Membrane Separation Processes |
| CHE716 | Process Intensification |
| CHE717 | Colloids and Interface Engineering |
| CHE718 | Pinch Technology |
| CHE719 | Energy Management and Process Optimization in Chemical Industry |
| | |
| | DEPARTMENT OF CIVIL ENGINEERING |
| CEE710 | Structural Dynamics |
| CEE711 | Advanced Design of Steel Structures |
| CEE712 | Theory of Plates and Shells |
| CEE713 | Theory of Elasticity and Plasticity |
| CEE714 | Structural Health Monitoring |
| CEE720 | Soil Dynamics |
| CEE721 | Environmental Pollution and Control |
| CEE722 | Construction Planning and Management |
| CEE723 | Open Channel Hydraulics |
| CEE724 | Ground Water |
| CEE725 | Hydrology & Irrigation Engineering |
| CEE730 | Principles of Reliability |
| CEE731 | Offshore Structural Dynamics |
| CEE732 | Pre-stressed Concrete |
| CEE733 | Advanced Concrete Technology |
| CEE734 | Advanced Structural Mechanics |

| | |
|---|---|
| | **DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING** |
| **CSE710** | **Machine Learning** |
| **CSE711** | **Graph Theory** |
| **CSE712** | **Electronic Design Automation** |
| **CSE713** | **Natural Language Processing** |
| **CSE714** | **Data Warehousing and Data Mining** |
| **CSE715** | **Digital Image Processing** |
| **CSE716** | **Data Analytics** |
| **CSE717** | **Biometrics** |
| **CSE718** | **Cryptography and Network Security** |
| **CSE719** | **Multimedia Information Systems** |
| **CSE720** | **Cellular Automata and its Application** |
| **CSE721** | **Computational Geometry** |
| **CSE722** | **Complex Network Theory** |
| **CSE723** | **Pattern Recognition** |
| **CSE724** | **Semantic Web Technology** |
| **CSE725** | **Human Computer Interaction** |
| | |
| | **DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING** |
| **ECE710** | **Detection and Estimation Theory** |
| **ECE711** | **Information Theory & Coding** |
| **ECE712** | **Analog IC Design** |
| **ECE713** | **FPGA Based Design** |
| **ECE714** | **MEMS and Microsystems Technology** |
| **ECE715** | **Machine Learning** |
| **ECE716** | **Millimetre Wave Technology** |
| **ECE717** | **RF ID Technology and Applications** |
| **ECE718** | **VLSI System Design** |
| **ECE719** | **Telecommunication Networks** |
| **ECE720** | **Advanced Semiconductor Devices** |
| **ECE721** | **Random Processes** |
| **ECE722** | **Microwave Circuits & Techniques** |
| **ECE723** | **Semiconductor Device Modelling** |
| **ECE724** | **Biomedical Instrumentation** |
| **ECE725** | **Adhoc and Sensor Networks** |
| | |

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|---|---|
| | **DEPARTMENT OF ELECTRICAL ENGINEERING** |
| **EEE710** | **Renewable Energy Systems** |
| **EEE711** | **Advanced Power Converters** |
| **EEE712** | **Generalized Theory of Electrical Machines** |
| **EEE713** | **Electrical Drives** |
| **EEE714** | **Power System Planning, Operation and Control** |
| **EEE715** | **Embedded Systems** |
| **EEE716** | **FACTS Device** |
| **EEE717** | **Generation & Utilization of Electrical Power** |
| **EEE718** | **Advanced Control Systems** |
| **EEE719** | **Microprocessor & Embedded Systems** |
| **EEE720** | **Digital Signal Processing** |
| | |
| | **DEPARTMENT OF MECHANICAL ENGINEERING** |
| **MEE710** | **Finite Element Method** |
| **MEE711** | **Computational Fluid Dynamics and Heat Transfer** |
| **MEE712** | **Design and Optimisation of Thermal Systems** |
| **MEE713** | **Non-Conventional Machining** |
| **MEE714** | **Advanced Welding Technology** |
| **MEE715** | **Robotics** |
| **MEE716** | **Mechanical Equipment Design** |
| **MEE717** | **Control Systems** |
| **MEE718** | **Fundamentals of Combustion** |
| **MEE719** | **Modelling and Simulation of Dynamic Systems** |
| **MEE720** | **Non-Linear Vibration** |
| **MEE721** | **Convective Heat and Mass Transfer** |
| **MEE722** | **Additive Manufacturing** |
| **MEE723** | **Energy Conversion Systems** |
| **MEE724** | **Hydraulic Machines** |
| | |
| | **DEPARTMENT OF METALLURGY AND MATERIALS ENGINEERING** |
| **MME710** | **Functional Materials** |
| **MME711** | **Fatigue, Creep and Fracture** |
| **MME712** | **Computational Materials Engineering** |
| **MME713** | **Fuel, Furnace and Refractories** |
| **MME714** | **Powder Metallurgy** |
| **MME715** | **Secondary Steel Making** |
| **MME716** | **Composite Materials** |
| **MME717** | **Corrosion Engineering** |
| **MME718** | **Energy and Environment in Metallurgical Industries** |
| | |

## EIGHTH SEMESTER

| | |
|---|---|
| | **DEPARTMENT OF BIOTECHNOLOGY** |
| **BTE810** | **Plant Developmental Biology** |
| **BTE811** | **Bioprocess Plant & Equipment Design** |
| **BTE812** | **Medical & Pharmaceutical Biotechnology** |
| **BTE813** | **GM Crops** |
| **BTE814** | **Bioethics & IPR** |
| **BTE815** | **Environmental Microbiome** |
| | |
| | **DEPARTMENT OF CHEMICAL ENGINEERING** |
| **CHE810** | **Multiphase Flow** |
| **CHE811** | **Process Analysis and Optimisation** |
| **CHE712** | **Boiling Heat Transfer** |
| **CHE813** | **CFD Applications in Chemical Engineering** |
| **CHE814** | **Nanotechnology** |
| | |
| | **DEPARTMENT OF CIVIL ENGINEERING** |
| **CEE810** | **Sediment transport** |
| **CEE811** | **Slope Stability and Reinforced Earth** |
| **CEE812** | **Soil Structure Interaction** |
| **CEE813** | **Industrial Waste** |
| **CEE814** | **Water Resources System Planning & Management** |
| **CEE815** | **Machine Foundation** |
| | |
| | **DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING** |
| **CSE811** | **Distributed Systems** |
| **CSE812** | **Computer Vision** |
| **CSE813** | **Optical Networks** |
| **CSE814** | **Internet Of Things** |
| **CSE815** | **Cloud Computing** |
| **CSE816** | **Mobile Computing** |
| **CSE817** | **Expert Systems** |
| | |
| | **DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING** |
| **ECE810** | **Wireless Communication** |
| **ECE811** | **Mixed Signal IC Design** |
| **ECE812** | **Broadband Communication** |
| **ECE813** | **Digital Image Processing** |
| **ECE814** | **Error Control Coding** |
| **ECE815** | **Embedded System Design** |
| **ECE816** | **RF and MMIC** |
| **ECE817** | **Design with Op. Amps. & Analog Integrated Circuits** |
| **ECE818** | **Satellite Communication** |
| **ECE819** | **RF IC Design** |
| **ECE820** | **Low Power Circuits & Systems** |
| **ECE821** | **Advanced Antenna Synthesis** |
| **ECE822** | **DSP Architectures in VLSI** |
| **ECE823** | **Internet of Things (IoT) Technology** |
| **ECE824** | **VLSI Testing and Verification** |
| **ECE825** | **Statistical Signal Processing** |
| | |
| | **DEPARTMENT OF ELECTRICAL ENGINEERING** |
| **EEE810** | **Power System Transients & Power Quality** |
| **EEE811** | **Smart Grid** |

| | |
|---|---|
| | **DEPARTMENT OF MECHANICAL ENGINEERING** |
| **MEE810** | **Solar Energy** |
| **MEE811** | **Mechatronics** |
| **MEE812** | **Micro and Nano Manufacturing** |
| **MEE813** | **Microfluidics** |
| **MEE814** | **Machine Tool Engineering and Automation** |
| **MEE815** | **Theory of Plates** |
| **MEE816** | **Advanced Mechanical Vibration** |
| | |
| | **DEPARTMENT OF METALLURGY AND MATERIALS ENGINEERING** |
| **MME810** | **Nano Science and Technology** |
| **MME811** | **FEM Modelling and Simulation for Materials Design** |
| **MME812** | **Mathematical Modelling and Simulation** |
| **MME813** | **Raw Materials Preparation for Iron and Steel Making** |

**CURRICULUM OF 2018 ONWARD UNDERGRADUATE ADMISSION BATCH**

**CHEMISTRY- 5 YEAR INTEGRATED MSC**

| Semester - III | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | MAC331 | Mathematics – III | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CYC301 | State of Matter and Chemical Thermodynamics | 3 | 1 | 0 | 4.0 | 4 |
| 3 | CYC302 | Atomic Structure and Chemical Bonding | 3 | 1 | 0 | 4.0 | 4 |
| 4 | CYC303 | Stereochemistry and Basic Principle of Organic Chemistry | 3 | 1 | 0 | 4.0 | 4 |
| 5 | PHC334 | Physics – II | 3 | 0 | 0 | 3.0 | 3 |
| 6 | PHS384 | Physics- II Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CYS351 | Qualitative Analysis of Organic Samples Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 8 | XXS381 | Co-curricular Activities - III (optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 4 | 6 | 22.0 | 25 |
| **Semester - IV** | | | | | | | |
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | CYC401 | Biochemistry: Structure and Function | 3 | 0 | 0 | 3.0 | 3 |
| 2 | CYC402 | Phase-Equilibrium, Chemical Kinetics and Catalysis | 3 | 1 | 0 | 4.0 | 4 |
| 3 | CYC403 | Chemistry of Elements and Radioactivity | 3 | 1 | 0 | 4.0 | 4 |
| 4 | CYC404 | Organic Reaction Mechanism and Reactive Intermediates | 3 | 1 | 0 | 4.0 | 4 |
| 5 | YYE44*/ HSC431 | Open Elective - 1/ Psychology | 3 | 0 | 0 | 3.0 | 3 |
| 6 | CYS451 | Thermodynamic Properties of Solution and Mixture Laboratory | 0 | 0 | 4 | 2.0 | 4 |
| 7 | CYS452 | Identification of Acidic and Basic Radicals Laboratory | 0 | 0 | 4 | 2.0 | 4 |
| 8 | CYS453 | Biochemistry Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS481 | Co-curricular Activities - IV (optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 3 | 11 | 23.5 | 29 |
| **Semester - V** | | | | | | | |
| **Sl.** | **Code** | **Subject** | **L** | **T** | **S** | **C** | **H** |
| 1 | CYC501 | Fundamentals of Electrochemistry and Surface Chemistry | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CYC502 | Chemistry in Solution and Solid State Chemistry | 3 | 1 | 0 | 4.0 | 4 |
| 3 | CYC503 | Chemistry of Heterocyclic Compounds and Natural Products | 3 | 1 | 0 | 4.0 | 4 |
| 4 | CYC504 | Industrial Chemistry | 3 | 0 | 0 | 3.0 | 3 |
| 5 | YYE54* | Open Elective – 2 | 3 | 0 | 0 | 3.0 | 3 |
| 6 | CYS551 | Chemical Kinetics, Surface Chemistry and Conductometry Laboratory | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CYS552 | Quantitative estimation of metal ions in mixture | 0 | 0 | 4 | 2.0 | 4 |
| 8 | CYS553 | Quantitative Analysis of Organic Samples | 0 | 0 | 3 | 1.5 | 3 |
| 9 | XXS581 | Co-curricular Activities- V (optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 3 | 10 | 23.0 | 28 |

| Semester - VI | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | CYC601 | Basics of Photochemistry, Spectroscopy, Group Theory and Data Analysis | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CYC602 | Coordination Chemistry | 3 | 1 | 0 | 4.0 | 4 |
| 3 | CYC603 | Reagents in Organic Synthesis | 3 | 1 | 0 | 4.0 | 4 |
| 4 | CYE610 -- | Departmental Elective-1 | 3 | 0 | 0 | 3.0 | 3 |
| 5 | XEC631 | Economics and Management Accountancy | 3 | 0 | 0 | 3.0 | 3 |
| 6 | CYS651 | Potentiometric and Colorimetric Analysis | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CYS652 | Analysis of Ores and Alloys | 0 | 0 | 4 | 2.0 | 4 |
| 8 | CYS653 | Single Step Synthesis of Organic Compounds | 0 | 0 | 4 | 2.0 | 4 |
| 9 | CYS654 | Comprehensive Viva Voce – I | 0 | 0 | 0 | 1.0 | 0 |
| 10 | XXS681 | Co-curricular Activities - VI (Optional) | 0 | 0 | 0 | 0.0 | 0 |
| | | TOTAL | 15 | 3 | 10 | 24.5 | 28 |
| Semester - VII | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | MSC731 | Principles of Management | 3 | 0 | 0 | 3.0 | 3 |
| 2 | CYC701 | Quantum Chemistry and Spectroscopy | 3 | 1 | 0 | 4.0 | 4 |
| 3 | CYC702 | Inorganic Reaction Mechanisms and Magnetochemistry | 3 | 1 | 0 | 4.0 | 4 |
| 4 | CYC703 | Concept of Organic Synthesis and Asymmetric Synthesis | 3 | 1 | 0 | 4.0 | 4 |
| 6 | CYC704 | Mathematical and Computational Chemistry | 3 | 0 | 0 | 3.0 | 3 |
| 7 | CYS751 | Spectrophotochemical Analysis | 0 | 0 | 3 | 1.5 | 3 |
| 8 | CYS752 | Spectrophotometric Estimation of Cations and Anions | 0 | 0 | 3 | 1.5 | 3 |
| 9 | CYS753 | Separation and Identification of Organic Compounds from Binary Mixture | 0 | 0 | 4 | 2.0 | 4 |
| | | TOTAL | 15 | 3 | 10 | 23.0 | 28 |
| Semester - VIII | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | CYC801 | Chemical, Statistical Thermodynamics and Electrochemistry | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CYC802 | Organometallic Compounds and Bioinorganic Chemistry | 3 | 1 | 0 | 4.0 | 4 |
| 3 | CYC803 | Pericyclic Reactions and Organic Photochemistry | 3 | 1 | 0 | 4.0 | 4 |
| 4 | CYE810 -- | Departmental Elective- 2 | 3 | 0 | 0 | 3.0 | 3 |
| 5 | CYS851 | Advanced Physical Chemistry Practical | 0 | 0 | 4 | 2.0 | 4 |
| 6 | CYS852 | Synthesis and Characterisation of Complex Compounds | 0 | 0 | 3 | 1.5 | 3 |
| 7 | CYS853 | Chromatographic Separation of Organic Compounds | 0 | 0 | 3 | 1.5 | 3 |
| | | TOTAL | 12 | 3 | 10 | 20.0 | 25 |
| Semester - IX | | | | | | | |
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | CYE9 -- | Special subject -1 | 3 | 1 | 0 | 4.0 | 4 |
| 2 | CYE9 -- | Special subject -2 | 3 | 1 | 0 | 4.0 | 4 |
| 3 | CYE9 -- | Special subject -3 | 3 | 1 | 0 | 4.0 | 4 |
| 4 | CYE9 -- | Special subject -4 | 3 | 1 | 0 | 4.0 | 4 |
| 5 | CYS9 -- | Special subject Practical | 0 | 0 | 3 | 1.5 | 3 |
| 6 | CYS951 | Project- I | 0 | 0 | 3 | 1.0 | 4 |
| 7 | CYS952 | Vocational training/ Summer internship/ Term Paper | 0 | 0 | 0 | 1.0 | 0 |
| 8 | CYS953 | Comprehensive Viva Voce – II | 0 | 0 | 0 | 1.5 | 0 |
| | | TOTAL | 12 | 4 | 7 | 21.0 | 23 |

| Semester - X | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sl. | Code | Subject | L | T | S | C | H |
| 1 | CYS051 | Project – II/ Internship | 0 | 0 | 30 | 10.0 | 30 |
| 2 | CYS052 | Seminar & Viva voce | 0 | 0 | 0 | 2.0 | 0 |
| | | TOTAL | 0 | 0 | 30 | 12.0 | 30 |

**CREDIT UNIT OF THE PROGRAM:**

| Semester | I + II | III | IV | V | VI | VII | VIII | IX | X | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| Credit Unit | 44.0 | 22.0 | 23.5 | 23.0 | 24.5 | 23.0 | 20.0 | 21.0 | 12.0 | 213.0 |

**Baskets of Departmental Electives:**

| | Elective-1 |
|---|---|
| CYE611 | Analytical and Environmental Chemistry |
| CYE612 | Chromatographic Separation and Instrumental Methods of Analysis |
| | Elective-2 |
| CYE811 | Advanced Natural Products and Medicinal Chemistry |
| CYE812 | Spectroscopic Methods of Chemical Analysis |

**Special subjects:**

| | Physical Chemistry specialisation: |
|---|---|
| CYE911 | Advanced Quantum Chemistry and Application of Group Theory |
| CYE912 | Non-Equilibrium Thermodynamics and Biophysical Chemistry |
| CYE913 | Material Chemistry and Advanced Spectroscopy |
| CYE914 | Electrode Kinetics and Corrosion Science |
| CYS961 | Advanced Physical Chemistry-II Laboratory |
| | Inorganic Chemistry specialisation: |
| CYE921 | Advanced Green Chemistry and Analytical Chemistry |
| CYE922 | Synthetic Methodology for Metal Complexes and Coordination Aggregates |
| CYE923 | Small Molecule Activation and Nuclear Chemistry |
| CYE924 | Group theory, Applied Electrochemistry and X-ray Structure Analysis |
| CYS971 | Environmental Sample Analysis |
| | Organic Chemistry specialisation: |
| CYE931 | Application of some Important Reactions in Synthetic Organic Chemistry |
| CYE932 | Natural Products and Drug Design |
| CYE933 | Bioorganic Chemistry |
| CYE934 | Advanced Stereochemistry and Structure-reactivity Correlation |
| CYS981 | Multi Step Synthesis and Characterization of Organic Compounds |