**Second Year Third Semester**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A.THEORY** | | | | | | | | | | | | |
| **Sl No.** | | **Subject Code** | **Theory** | **Contact Hours/Week** | | | | | | | | **Credit**  **Points** |
|  | |  |  | **L** | | **T** | **P** | | **Total** | | |  |
| **1** | | HU-301 | Values & Ethics in  Profession | 3 | | 0 | 0 | | 3 | | | 3 |
| **2** | | CH- 301 | Basic Environmental  Engineering &  Elementary Biology | 3 | | 0 | 0 | | 3 | | | 3 |
| **3** | | CH- 302 | Chemistry | 3 | | 1 | 0 | | 4 | | | 4 |
| **4** | | BT-301 | Thermodynamics and  Kinetics | 3 | | 0 | 0 | | 3 | | | 3 |
| **5** | | BT-302 | Biochemistry | 3 | | 1 | 0 | | 4 | | | 4 |
| **6** | | BT-303 | Microbiology | 3 | | 1 | 0 | | 4 | | | 4 |
| **Total of Theory** | | | | | | | | | **21** | | | **21** |
| **B. PRACTICAL** | | | | | | | | | | | | |
| **7** | | CH(BT)- 381 | Basic Environmental  Engineering &  Elementary Biology Lab | 0 | | 0 | 3 | | | 3 | 2 | |
| **8** | | CH-382 | Chemistry Lab | 0 | | 0 | 3 | | | 3 | 2 | |
| **9** | | BT-391 | Biochemistry Lab | 0 | | 0 | 3 | | | 3 | 2 | |
| **10** | | BT-392 | Microbiology Lab | 0 | | 0 | 3 | | | 3 | 2 | |
| **Total of Practical** | | | | | | | | | | **12** | **8** | |
| **C. SESSIONAL** | | | | | | | | | | | | |
| **11** | GS-381 | | General Studies - III | | 3 | 1 | | 0 | | 4 | 4 | |
| **Total of Sessional** | | | | | | | | | | **4** | **4** | |
| **Total of Semester** | | | | | |  | |  | | **37** | **33** | |

**Second Year Fourth Semester**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A.THEORY** | | | | | | | | | | | | |
| **Sl No.** | **Subject Code** | | **Theory** | | | **Contact Hours/Week** | | | | | | **Credit**  **Points** |
|  |  | |  | | | **L** | **T** | | | **P** | **Total** |  |
| **1** | M (CS)-401 | | Numerical Methods | | | 2 | 1 | | | 0 | 3 | 2 |
| **2** | CH-401 | | Industrial  Stoichiometry | | | 3 | 1 | | | 0 | 4 | 4 |
| **3** | CH-402 | | Transfer Operation I | | | 3 | 0 | | | 0 | 3 | 3 |
| **4** | BT-401 | | Molecular Biology | | | 3 | 1 | | | 0 | 4 | 4 |
| **5** | BT-402 | | Industrial Microbiology and Enzyme Technology | | | 3 | 1 | | | 0 | 4 | 4 |
| **Total of Theory** | | | | | | | | | | | **18** | **17** |
| **B. PRACTICAL** | | | | | | | | | | | | |
| **6** | HU-481 | | Technical Report Writing &Language Lab Practice | | | 0 | 0 | | | 3 | 3 | 2 |
| **7** | M (CS)-491 | | Numerical Methods | | | 0 | 0 | | | 2 | 2 | 1 |
| **8** | CH-481 | | Transfer Operation I Lab | | | 0 | 0 | | | 3 | 3 | 2 |
| **9** | BT-491 | | Molecular Biology Lab | | | 0 | 0 | | | 3 | 3 | 2 |
| **10** | BT-492 | | Fermentation Technology Lab | | | 0 | 0 | | | 3 | 3 | 3 |
| **Total of Practical** | | | | | | | | | | | **14** | **10** |
| **C. SESSIONAL** | | | | | | | | | | | | |
| **11** | | GS-481 | | General Studies - IV | 3 | | | 1 | 0 | | 4 | 4 |
| **Total of Sessional** | | | | | | | | | | | **4** | **4** |
| **Total of Semester** | | | | | | | | | | | **36** | **31** |

**Third Year – Fifth Semester**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A.THEORY** | | | | | | | | | | | | | |
| **Sl No.** | | **Subject Code** | | **Theory** | **Contact Hours/Week** | | | | | | | **Credit**  **Points** | |
|  | |  | |  | **L** | | **T** | | | **P** | **Total** |  | |
| **1** | | **HU-511** | | Principles & Practices of Management | 3 | | 0 | | | 0 | 3 | 3 | |
| **2** | | **BT-501** | | Genetics | 3 | | 1 | | | 0 | 4 | 4 | |
| **3** | | **BT-502** | | Bioinformatics | 3 | | 1 | | | 0 | 4 | 4 | |
| **4** | | **CH-515** | | Transfer operation –II | 3 | | 1 | | | 0 | 4 | 4 | |
| **5** | | **CS-515** | | Database Management System | 3 | | 0 | | | 0 | 3 | 3 | |
| Total of Theory | | | | | | | | | | | 18 | 18 | |
| B. PRACTICAL | | | | | | | | | | | | | |
| **6** | | **BT-591** | | Genetics Lab | 0 | | 0 | | | 3 | 3 | 2 | |
| **7** | | **BT-592** | | Bioinformatics Lab | 0 | | 0 | | | 3 | 3 | 2 | |
| **8** | | **CH-584** | | Transfer operation Lab-II | 0 | | 0 | | | 3 | 3 | 2 | |
| **9** | | **CS-584** | | Database Management System Lab | 0 | | 0 | | | 3 | 3 | 2 | |
| Total of Practical | | | | | | | | | | | 12 | 8 | |
| C. SESSIONAL | | | | | | | | | | | | | |
| **10** | **GS-581** | | General Studies – V | | | 3 | | 1 | 0 | | 4 | | 4 |
| Total of Sessional | | | | | | | | | | | 4 | | 4 |
| **Total of Semester** | | | | | | | | | | | **34** | | **30** |

**Third Year – Sixth Semester**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A.THEORY** | | | | | | | | | | | | |
| **Sl No.** | **Subject Code** | | **Theory** | | **Contact Hours/Week** | | | | | | | **Credit**  **Points** |
|  |  | |  | | **L** | | | | **T** | **P** | **Total** |  |
| **1** | **HU-611** | | Production & Operations Management | | 2 | | | | 0 | 0 | 2 | 2 |
| **2** | **BT-601** | | Recombinant DNA Technology | | 3 | | | | 0 | 0 | 3 | 3 |
| **3** | **BT-602** | | Immunology | | 3 | | | | 0 | 0 | 3 | 3 |
| **4** | **BT-603** | | Plant Biotechnology | | 3 | | | | 0 | 0 | 3 | 3 |
| **5** | **BT-604** | | 604A: Bioseperation Technology  604B: Molecular Modeling & Drug Designing  604C: Biophysics of Macromolecules  604D: Biosensor & Diagnostics  604E: Biofertilizer&Biopesticide | | 3 | | | | 0 | 0 | 3 | 3 |
| **6** | **CS-615** | | Software Engineering | | 3 | | | | 0 | 0 | 3 | 3 |
| Total of Theory | | | | | | | | | | | 17 | 17 |
| B. PRACTICAL | | | | | | | | | | | | |
| **7** | **BT-691** | | Recombinant DNA Technology Lab | | | | 0 | | 0 | 3 | 3 | 2 |
| **8** | **BT-692** | | Immunology Lab | | | | 0 | | 0 | 3 | 3 | 2 |
| **9** | **BT693** | | Plant Biotechnology Lab | | | | 0 | | 0 | 3 | 3 | 2 |
| **10** | **CS-684** | | Software Engineering Lab | | | | 0 | | 0 | 3 | 3 | 2 |
| **11** | **BT-694** | | Seminar ( Review and Presentation by PPT ) | | | | 0 | | 0 | 1 | 1 | 1 |
| **Total of Practical** | | | | | | | | | | | **13** | **9** |
| C. SESSIONAL | | | | | | | | | | | | |
| **12** | | **GS-681** | | General Studies – VI | | 3 | | 1 | | 0 | 4 | 4 |
| **Total of Sessional** | | | | | | | | | | | **4** | **4** |
| **Total of Semester** | | | | | | | | | | | **34** | **30** |

**Fourth Year – Seventh Semester**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A.THEORY** | | | | | | | | | | | | | |
| **Sl No.** | | **Subject Code** | | **Theory** | | **Contact Hours/Week** | | | | | | | **Credit**  **Points** |
|  | |  | |  | | **L** | | **T** | | **P** | **Total** | |  |
| **1** | | BT-701 | | Bioreactor Design and Analysis | | 3 | | 0 | | 0 | 3 | | 3 |
| **2** | | BT-702 | | Animal Cell Culture & Animal Biotechnology | | 3 | | 0 | | 0 | 3 | | 3 |
| **3** | | BT-703 | | Food Biotechnology | | 3 | | 0 | | 0 | 3 | | 3 |
| **4** | | BT-704 | | 704A: Environmental Biotechnology & Pollution Control  704B: Modeling & Simulation of Bioprocesses  704C: Biomaterials  704D: Biometalergy  704E: Proteomics & Protein Engineering  704F: Human Genomics | | 3 | | 0 | | 0 | 3 | | 3 |
| **5** | | CHE-701 | | A. Process Instrumentation & Control  B. Object Oriented Programming | | 3 | | 0 | | 0 | 3 | | 3 |
| Total of Theory | | | | | | | | | | | 15 | | 15 |
| B. PRACTICAL | | | | | | | | | | | | | |
| **6** | | HU-781 | | Group Discussion | | 0 | | 0 | | 2 | | 2 | 2 |
| **7** | | BT-791 | | Bioreactor Design & Analysis Lab | | 0 | | 0 | | 3 | | 3 | 2 |
| **8** | | BT-792 | | Food Biotechnology Lab | | 0 | | 0 | | 3 | | 3 | 2 |
| **9** | | CHE-  783 | | Process Instrumentation & Control Lab | | 0 | | 0 | | 3 | | 3 | 2 |
| **10** | | BT-793 | | Seminar (Review and Presentation by PPT of a Research Paper) | | 0 | | 0 | | 2 | | 2 | 1 |
| **11** | | BT-794 | | Project Work -I (Project Repot-I) | | 0 | | 0 | | 6 | | 6 | 3 |
| **12** | | BT-795 | | Industrial project/training ( Report, Poster Presentation &  Viva Voce ) | | 6 to 8 weeks | | | | | | | 2 |
| Total of Practical | | | | | | | | | | | | 19 | 14 |
| C. SESSIONAL | | | | | | | | | | | | | |
| **13** | GS-781 | | General Studies – VII | | 3 | | 1 | | 0 | | | 4 | 4 |
| Total of Sessional | | | | | | | | | | | | 4 | 4 |
| Total of Semester | | | | | | | | | | | | 38 | 33 |

**Fourth Year – Eighth Semester**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A.THEORY** | | | | | | | | | | | |
| **Sl No.** | **Subject Code** | | | **Theory** | **Contact Hours/Week** | | | | | | **Credit**  **Points** |
|  |  | | |  | **L** | **T** | **P** | | **Total** | |  |
| **1** | HU(BT)-  801 | | | Bioethics, Biosafety, IPR &  Entrepreneurship in Biotechnology | 3 | 0 | 0 | | 3 | | 3 |
| **2** | BT-801 | | | Medical & Pharmaceutical  Biotechnology | 3 | 0 | 0 | | 3 | | 3 |
| **3** | BT-802 | | | 802A: Renewable Energy Technology  802B: Tissue Engineering  802C: Biomedical Engineering  802D: Post Harvest Technology  802E: Metabolic Engineering | 3 | 0 | 0 | | 3 | | 3 |
| Total of Theory | | | | | | | | | 9 | | 9 |
| B. PRACTICAL | | | | | | | | | | | |
| **4** | BT-891 | | | Design Lab /Industrial problem/ Industrial related training | 0 | 0 | 6 | | | 6 | 4 |
| **5** | BT-892 | | | Project work-II | 0 | 0 | 12 | | | 12 | 4 |
| **6** | BT-893 | | | Project Report-II Report and Defense Seminar by  PPT | 0 | 0 | 0 | | | 0 | 2 |
| **7** | BT-894 | | | Grand Viva ( Comprehensive Viva Voce) | 0 | 0 | 0 | | | 0 | 3 |
| Total of Practical | | | | | | | | | | 18 | 13 |
| C. SESSIONAL | | | | | | | | | | | |
| **8** | | GS-881 | General Studies – VIII | | 3 | 1 | | 0 | | 4 | 4 |
| Total of Sessional | | | | | | | | | | 4 | 4 |
| Total of Semester | | | | | | | | | | 31 | 26 |