

## Chemical and Biochemical Engineering

### Semester- I (Common for all B.Tech Courses)

| S.No                         | C. Code     | Course                                                                           | L | T | P | C     |
|------------------------------|-------------|----------------------------------------------------------------------------------|---|---|---|-------|
| 1                            | MA 101      | Calculus                                                                         | 3 | 1 | 0 | 8     |
| 2                            | PH 101      | Quantum Physics and Applications                                                 | 2 | 1 | 0 | 6     |
| 3                            | CH 102      | Fundamental Concepts and Applications of Chemistry                               | 3 | 0 | 0 | 6     |
| 4                            | BB 103      | Introduction to Modern biology                                                   | 3 | 0 | 0 | 6     |
| 5                            | PH 113      | Hands on Science Laboratory - I                                                  | 0 | 0 | 3 | 3     |
| 6                            | CS 101      | Computer Programming                                                             | 3 | 0 | 2 | 8     |
| 7                            | HS 103      | Introduction to Fine Arts                                                        | 0 | 0 | 1 | PP/NP |
| 8                            | HS 106      | Design Thinking and Creativity                                                   | 1 | 0 | 0 | PP/NP |
| 9                            | NO107/NO105 | <a href="#">National Sports Organization (NSO)/National Service Scheme (NSS)</a> | 0 | 0 | 2 | 2     |
| First Semester Total Credits |             |                                                                                  |   |   |   | 37    |

### Semester II

| S.No          | Course Code    | Course Name                                                                      | L | T | P | C  |
|---------------|----------------|----------------------------------------------------------------------------------|---|---|---|----|
| 1             | MA 102         | Linear Algebra                                                                   | 3 | 1 | 0 | 4  |
| 2             | BB 201         | Biomolecules                                                                     | 2 | 1 | 0 | 6  |
| 3             | ME 111         | Engineering Graphics Laboratory                                                  | 1 | 0 | 3 | 5  |
| 4             | ME 201         | Engineering Mechanics                                                            | 2 | 1 | 0 | 6  |
| 5             | CS 201         | Data Structures and Algorithms                                                   | 3 | 0 | 0 | 6  |
| 6             | CS 211         | Data Structures and Algorithms Laboratory                                        | 0 | 0 | 3 | 3  |
| 7             | ME 113         | Hands on Engineering Laboratory                                                  | 0 | 0 | 3 | 3  |
| 8             | CL 101         | Introduction to chemical Engineering                                             | 3 | 0 | 0 | 6  |
| 9             | NO 105/ NO 107 | <a href="#">National Sports Organization (NSO)/National Service Scheme (NSS)</a> | 0 | 0 | 2 | 2  |
| Total Credits |                |                                                                                  |   |   |   | 39 |

### Semester III

| S.No          | Course Code | Course Name                                                      | L | T | P | C  |
|---------------|-------------|------------------------------------------------------------------|---|---|---|----|
| 1             | CL 201      | Introduction to Transport Phenomena                              | 3 | 0 | 0 | 6  |
| 2             | CL 204      | Introduction to chemical engineering thermodynamics              | 3 | 0 | 0 | 6  |
| 3             | ME 203      | Fluid Mechanics                                                  | 2 | 1 | 0 | 6  |
| 4             | ME 222      | Mechanics of Materials                                           | 2 | 1 | 0 | 6  |
| 5             | EE 221      | Introduction to Probability (1st Half)                           | 3 | 0 | 0 | 3  |
| 6             | EE 227      | Data Analysis (2nd Half)                                         | 3 | 0 | 0 | 3  |
| 7             | BB 301      | Basics of Cell Biology and Genetics                              | 3 | 0 | 0 | 6  |
| 8             | CL 211      | Chemical Engineering lab -I (Thermodynamics and fluid mechanics) | 0 | 0 | 3 | 3  |
| Total Credits |             |                                                                  |   |   |   | 39 |

### Semester IV

| S.No | Course Code | Course Name                                        | L | T | P | C  |
|------|-------------|----------------------------------------------------|---|---|---|----|
| 1    | ME 220      | Heat Transfer                                      | 2 | 1 | 0 | 6  |
| 2    | EE 101      | Introduction to Electrical Systems and Electronics | 3 | 0 | 0 | 6  |
| 3    | MA 407      | Introduction to Numerical Linear Algebra           | 3 | 1 | 0 | 4  |
| 4    | MA 103      | Differential Equations - I                         | 3 | 1 | 0 | 4  |
| 5    | BB 404      | Biophysics                                         | 3 | 0 | 0 | 3  |
| 6    | CL 202      | Reaction engineering                               | 3 | 0 | 0 | 6  |
| 7    | CH 201      | Organic Chemistry                                  | 3 | 0 | 0 | 3  |
| 8    | CL 203      | Mass transfer                                      | 3 | 0 | 0 | 6  |
|      |             | Total Credits                                      |   |   |   | 38 |
|      |             |                                                    |   |   |   |    |
|      |             |                                                    |   |   |   |    |

### Semester V

| S.No | Course Code | Course Name                                                           | L | T | P | C  |
|------|-------------|-----------------------------------------------------------------------|---|---|---|----|
| 1    | CH302T      | Process Equipment Design and Economics                                | 3 | 0 | 0 | 6  |
| 2    | HS201T      | Economics                                                             | 3 | 0 | 0 | 6  |
| 3    | CL 212      | Chemical Engineering lab -II (Heat Transfer & Solid mechanics)        | 0 | 0 | 3 | 3  |
| 4    | CL302L      | Chemical Engineering Lab III (mass transfer and reaction engineering) | 0 | 0 | 3 | 3  |
| 5    |             | Programme elective-I                                                  | 3 | 0 | 0 | 6  |
| 6    | CH305T      | Electrochemistry                                                      | 3 | 0 | 0 | 3  |
| 7    | CH303T      | Introduction to computational chemistry                               | 3 | 0 | 0 | 3  |
| 8    |             | Programme elective-II                                                 | 3 | 0 | 0 | 6  |
|      |             | Total Credits                                                         |   |   |   | 36 |
|      |             |                                                                       |   |   |   |    |
|      |             |                                                                       |   |   |   |    |

### Semester VI (Yellow highlights are courses must for honors)

| S.No | Course Code | Course Name                      | L | T | P | C  |
|------|-------------|----------------------------------|---|---|---|----|
| 1    | CH403T      | Catalysis                        | 3 | 0 | 0 | 3  |
| 2    | CE301T      | Environmental Studies            | 3 | 0 | 0 | 6  |
| 3    | EE 226      | Control systems and lab          | 2 | 0 | 2 | 6  |
| 4    |             | Programme elective-III           | 3 | 0 | 0 | 6  |
| 5    |             | Programme elective-IV            | 3 | 0 | 0 | 6  |
| 6    |             | Scientific presentation          | 0 | 0 | 3 | 3  |
| 7    | CL402T      | Chemical reaction engineering-II | 3 | 0 | 3 | 6  |
|      |             | Total Credits                    |   |   |   | 30 |
|      |             |                                  |   |   |   |    |
|      |             |                                  |   |   |   |    |

### Semester VII

| S.No | Course Code | Course Name             | L | T | P | C |
|------|-------------|-------------------------|---|---|---|---|
| 1    | CL405T      | Bio Process Engineering | 3 | 0 | 0 | 6 |
| 2    |             | HSS Elective-I          | 3 | 0 | 0 | 6 |
| 3    | CL401S      | Scientific Presentation | 3 | 0 | 0 | 3 |

|                      |                                           |                             |          |          |          |            |
|----------------------|-------------------------------------------|-----------------------------|----------|----------|----------|------------|
| 4                    |                                           | Program Elective-IV/BTP-I   | 3        | 0        | 0        | 6          |
|                      |                                           | Total Credits               |          |          |          | 21         |
|                      |                                           |                             |          |          |          |            |
|                      |                                           |                             |          |          |          |            |
| <b>Semester VIII</b> |                                           |                             |          |          |          |            |
| <b>S.No</b>          | <b>Course Code</b>                        | <b>Course Name</b>          | <b>L</b> | <b>T</b> | <b>P</b> | <b>C</b>   |
| 1                    |                                           | Programme Elective-V/BTP-II | 3        | 0        | 0        | 6          |
| 2                    |                                           | Institute Elective-I        | 3        | 0        | 0        | 6          |
| 3                    |                                           | HSS Elective-II             | 3        | 0        | 0        | 6          |
|                      |                                           | Total Credits               |          |          |          | 18         |
|                      |                                           |                             |          |          |          |            |
|                      | <b>Overall Credits Required (Minimum)</b> |                             |          |          |          | <b>266</b> |