# Academic Regulations for M.E/M.Tech programme

## i) ADMISSIONS:

Admission into M.E/M.Tech Programmes of the Institute shall be made subject to the eligibility, qualifications and specialization as per the norms stipulated by Andhra University, Andhra Pradesh State Council for Higher Education (APSCHE) and All India Council for Technical Education (AICTE) from time to time.

## ii) PROGRAMMES OFFERED:

The following are the M.E/M.Tech. programmes offered by the Institute.

1 Biotechnology (Dept. of Chemical Engineering & Biotechnology)
2 Communication Systems (Dept. of Electronics & Communication Engineering)
3 Computer Science & Technology (Dept. of Computer Science & Engineering)
4 Control Systems Engineering (Dept. of Electrical & Electronics Engineering)
5 Machine Design (Dept. of Mechanical Engineering)

## iii) STRUCTURE OF THE M.E/M. Tech. PROGRAMME:

The programme of instruction will consist of advanced subjects of the respective specialization. The complete programme is distributed over four semesters with two semesters per academic year. Course work is offered in the first two semesters (except for PG programme in Computer Science where it is extended upto third semester) and the dissertation work will be carried out during third and fourth semesters. Every branch of M.E/M.Tech programme will have a curriculum and syllabi for the courses recommended by the board of studies and approved by the academic council. The academic programmes of the Institute follow the credit system.

## iv) DURATION OF THE PROGRAMME :

The duration of the programme is two academic years consisting of two semesters in each academic year. A student is permitted to complete the Programme in a stipulated time frame of 4 consecutive academic years from the date of initial admission.

## v) MEDIUM OF INSTRUCTION:

The medium of instruction and examination is in English.

## vi) MINIMUM INSTRUCTION DAYS:

The period of instruction shall comprise of a minimum of 16 weeks. The semester end examinations shall ordinarily be held after completion of 16 weeks.

## vii) Academic Calendar :

The dates of all important events, such as commencement of class work, examinations, vacations, etc., during the Academic year will be specified in the Academic Calendar of the Institute, as approved by the Academic council.

## viii) Examinations & Evaluation Process:

The performance of a student in each semester shall be evaluated subject-wise with a maximum of 100 marks each for theory and practical subjects.

### a) Theory course:

For all lecture based theory courses, the assessment shall be for 30 marks through internal evaluation and 70 marks through external end-semester examination of three hours duration.

### b) Internal evaluation:

The marks for the internal evaluation shall be awarded by the concerned teachers based on class work, quiz, viva-voce, assignments, student regularity and two mid-examinations etc., according to a scheme notified by the department at the beginning of the semester.

### c) External evaluation:

The question paper shall be set externally and valued both internally and externally. The average of the two valuations will be taken for award of marks. In case the difference of the marks obtained in the two valuations is more than 20%, then the third examiner shall value the script and out of the three valuations, the average of two valuations which are closer together will be taken into account.

### d) Laboratory course:

Each laboratory course will be evaluated for 100 marks, out of which 50 marks are for external examination and 50 marks are for internal evaluation. The internal marks are awarded based on continuous assessment, record work, internal lab examination and student regularity. The external examination will be conducted by two examiners, one of them being laboratory class teacher as internal examiner and an external examiner nominated by the principal from the panel of experts recommended by the HOD. However, for some of the PG courses where there is no external examination, entire lab course will be evaluated internally according to the schedule notified by the concerned department at the beginning of the semester.

A candidate shall be declared to have passed in any subject if he/she secures in the university examinations, not less than 40% in theory or lab course, in addition to securing minimum of 'E' grade.

e) Dissertation Work :

Every candidate shall be required to submit the record of dissertation work at the end of fourth semester. The viva-voce examination on the dissertation shall be conducted by a board of minimum four examiners consisting of

1. The Head of the Department as Chairman
2. Chairman, Board of studies of the concerned department
3. Internal guide
4. Expert member in the specialization to be nominated by Principal from panel of experts proposed by HoD from outside the Institute.

In case the dissertation work is not approved by the committee, the candidate shall repeat the work as directed by the Department Research Committee (DRC).

## ix) ATTENDANCE REGULATIONS:

Attendance of a student is computed by considering total number of periods conducted in all courses as the denominator and the total number of periods actually attended by the student in all courses, as the numerator. It is desirable for a student to put on 100% attendance in all the subjects. However, a candidate shall be permitted to appear for the semester end examination provided he/she maintains a minimum of 75% overall attendance in the semester.

The shortage of attendance on medical grounds can be condoned up to a maximum of 10% provided the student puts in at least 65% attendance and provided the principal is satisfied with the genuineness of the reasons. The Medical certificates are to be submitted to the Head of the Department when the candidate reports back to the classes immediately after the leave. Certificates submitted afterwards shall not be entertained. Condonation fee as fixed by the college for those who put on attendance between ≥ 65% and <75% shall be charged before the end examinations.

In the case of students who participate in co-curricular, extra-curricular activities like student seminars, N.S.S, N.C.C, Inter-collegiate tournaments and any such other activities involving the representation of the Institute, with the prior approval of the Principal routed through HoD along with his recommendations, the candidate may be deemed to have attended the classes during the actual period of such activity, solely for the purpose of attendance.

A student, who could not satisfy the minimum attendance requirement of 65% in any semester, shall be declared 'detained'. He/she is not eligible to appear for the semester end examinations and shall have to repeat that semester with the next batch of students.

The criteria for promotion from 1st semester to 2nd semester and to the subsequent semesters are based on the requisite attendance put up by the candidate.

## x) AWARD OF GRADES:

| S.No. | Range of Marks | Grade | Grade Points |
|---|---|---|---|
| 1 | 90% and above | A+ | 10 |
| 2 | 80% - 89% | A | 9 |
| 3 | 70% - 79% | B | 8 |
| 4 | 60% - 69% | C | 7 |
| 5 | 55% - 59% | D | 6 |
| 6 | 50% - 54% | E | 5 |
| 7 | <50% | F(Fail) | 0 |
| 8 | The grade 'I' represents insufficient attendance / absent (subsequently changed into pass or higher grades.) | I | 0 |

The performance of a student at the end of the each semester is indicated in terms of Semester Grade Point Average (SGPA). The SGPA is calculated as below:

$$SGPA = \frac{\Sigma \text{ (Credits of a course x Grade points awarded for a course)}}{\Sigma \text{(Credits of a course)}}$$

SGPA is calculated for the candidates who passed all the courses in that semester.

Cumulative Grade Point Average (CGPA) will be calculated from II semester onwards up to the final semester and its calculation is similar to SGPA, considering all the subjects enrolled from the first semester onwards.

## xi) AWARD OF CLASS :

A candidate who becomes eligible for the award of M.E/M.Tech degree shall be placed in one of the following Classes.

| S.No. | Class | CGPA |
|---|---|---|
| 1 | First Class With Distinction | 8.0 or more* |
| 2 | First Class | 6.5 or more but less than 8.0 |
| 3 | Second Class/Pass | 5.5 or more but less than 6.5 |

*First class with Distinction will be awarded to those students who clear all the subjects in single attempt including dissertation.

The CGPA can be converted to aggregate percentage by multiplying CGPA with 10, in case of requirement by any other university or for any other purpose.

## xii) ELIGIBILITY FOR AWARD OF M.E/M.TECH. DEGREE:

A student shall be eligible for award of the M.E/M.Tech degree if he/she fulfils all the following conditions

1) Registered and successfully completed all the components prescribed in the Programme of study to which he/she is admitted in the stipulated period,
2) Obtained CGPA greater than or equal to 5.5 (Minimum requirement for Pass),
3) No disciplinary action is pending against him/her and
4) Has no dues to the Institute including hostels.

## i) CONDUCT AND DISCIPLINE :

Students shall conduct themselves within and outside the premises of the Institute in a manner befitting the students of the Institution. As per the order of Honorable Supreme Court of India, ragging in any form is considered a criminal offence and is banned. Any form of ragging will be severely dealt with.

The following activities are not allowed within the campus

i) Possession, consumption or distribution of alcoholic drinks or any kind of narcotics or hallucinogenic drugs.

ii) Mutilation or unauthorized possession of library books.
iii) Noisy and unseemly behavior, disturbing studies of fellow students.
iv) Hacking computer systems (such as entering into other person's areas without prior permission, manipulation and/or damage of computer hardware and software or any other cyber crime etc.)
v) Use of cell phones in the campus.
vi) Plagiarism of any nature.
vii) Any other act of gross indiscipline as decided by the Institute from time to time.

- Commensurate with the gravity of offense, the punishment may be in terms of reprimand, fine, expulsion from the institute / hostel, debarment from examinations, disallowing the use of certain facilities of the Institute, suspension for a specified period or even outright expulsion from the Institute, or even handing over the case to appropriate law enforcement authorities or the judiciary, as required by the circumstances.
- Unauthorized collection of money in any form is strictly prohibited.
- Detained and Break-in-Study candidates are allowed into the campus for academic purposes only with permission from the principal.
- The Disciplinary Action Committee constituted by the Principal, shall be the authority to investigate the details of the offence, and recommend disciplinary action based on the nature and extent of the offence committed.
- All the students must abide by the code and conduct rules of the Institute.

## ii) MALPRACTICES :

The Principal shall refer the cases of suspected malpractices in mid-term examinations and Semester-End Examinations, to a Malpractice Enquiry Committee, constituted by the Institute. Such committee shall follow the approved scales of punishment. The Principal shall take necessary action, against the erring students based on the recommendations of the committee.

## iii) AMENDMENTS TO REGULATIONS:

The Institute may, from time to time, revise, amend, or change the Regulations, Schemes of Examinations, and / or Syllabi.

# M.Tech. (Communication Systems)
## 2 Year PG Degree Course

## Semester - I

| Subject code | Subject title | Credits | Pds/week | | Sessionals | Univ. Exam marks | Total |
|---|---|---|---|---|---|---|---|
| | | | Theory | Lab | | | |
| MTCS-1 | Communication Theory | 4 | 4 | - | 30 | 70 | 100 |
| MTCS-2 | Digital Communication Techniques | 4 | 4 | - | 30 | 70 | 100 |
| MTCS-3 | Advanced Digital signal processing | 4 | 4 | - | 30 | 70 | 100 |
| MTCS-4 | Telecommunication Switching & Queuing Theory | 4 | 4 | - | 30 | 70 | 100 |
| MTCS-5 | Elective –I | 4 | 4 | - | 30 | 70 | 100 |
| MTCS-6 | Elective-II | 4 | 4 | - | 30 | 70 | 100 |
| MTCS-7 | Communication Engineering Lab | 2 | - | 4 | 100 | - | 100 |
| MTCS-8 | Seminar - I | 2 | - | 2 | 100 | - | 100 |
| | Total | 28 | 24 | 6 | | | |

Elective – I
a) RF and Microwave Engineering
b) Optical Networks
c) Speech Signal Processing
d) Spectral Analysis of Signals

***Elective-II***

a) Embedded Systems
b) Neural Networks
c) Spread Spectrum Techniques & Multiple Access
d) Secure Communication

## Semester – II

| Subject code | Subject title | Credits | Pds/week | | Sessionals | Univ. Exam marks | Total |
|---|---|---|---|---|---|---|---|
| | | | Theory | Lab | | | |
| MTCS-9 | Satellite Communication and Phased Arrays | 4 | 4 | - | 30 | 70 | 100 |
| MTCS-10 | Wireless Communications and Networks | 4 | 4 | - | 30 | 70 | 100 |
| MTCS-11 | GPS and Applications | 4 | 4 | - | 30 | 70 | 100 |
| MTCS-12 | Multimedia Communication Systems | 4 | 4 | - | 30 | 70 | 100 |
| MTCS-13 | Elective - III | 4 | 4 | - | 30 | 70 | 100 |
| MTCS-14 | Elective – IV | 4 | 4 | - | 30 | 70 | 100 |
| MTCS-15 | Signal Processing Lab | 2 | - | 4 | 100 | - | 100 |
| MTCS-16 | Seminar - II | 2 | - | 2 | 100 | - | 100 |
| | Total | 28 | 24 | 6 | | | |

### *Elective-III*

a) Modern Radar Systems
b) Software Defined Radio
c) High Speed Communication Networks
d) Wavelet Transforms and Its Applications

### *Elective- IV*

a) Digital Image Processing
b) Modeling and Simulation of Communication Systems
c) Optical Wireless Communication Systems
d) Statistical Signal Processing

## Semester – III

| *Subject code* | *Subject title* | *Credits* | *Sessionals* | *Uni. Exam marks* | *Total* |
|---|---|---|---|---|---|
| MTCS – 17 | Thesis (Part I) | 15 | 50 | 50 | 100 |

Project work to be submitted before the end of 3rd Semester and it will be evaluated by a committee consisting of Chairman, Board of Studies, Head of the Department and thesis guide.

## Semester – IV

| *Subject code* | *Subject title* | *Credits* | *Sessionals* | *Uni. Exam marks* | *Total* |
|---|---|---|---|---|---|
| MTCS – 18 | Thesis (Part II) | 20 | 30 | 70 | 100 |

Thesis work is for a period of SIX months in Industry/Department. The students are required to submit their thesis two/three phases. Thesis will be evaluated by a committee consisting of an external member from reputed institution, HOD, Chairman, Board of Studies and thesis Guide.

# M.Tech. (Computer Science & Technology)
## 2 Year PG Degree Course

## Semester – I

| CODE NO | SUBJECT NAME | Periods | | | Sessional Marks | External Marks | Total | Credits |
|---|---|---|---|---|---|---|---|---|
| | | Theory | Lab | Total | | | | |
| CSEMT.1.1.1 | Mathematical Foundationsof Computer Science | 3 | - | 3 | 30 | 70 | 100 | 4 |
| CSEMT.1.1.2 | Data Structures & Algorithms | 3 | - | 3 | 30 | 70 | 100 | 4 |
| CSEMT.1.1.1 | Data Base Management Systems | 3 | - | 3 | 30 | 70 | 100 | 4 |
| CSEMT.1.1.3 | Computer Organization & Architecture | 3 | - | 3 | 30 | 70 | 100 | 4 |
| CSEMT.1.1.4 | Advanced Operating Systems | 3 | - | 3 | 30 | 70 | 100 | 4 |
| CSEMT.1.1.1 | Computer Networks | 3 | - | 3 | 30 | 70 | 100 | 4 |
| CSEMT.1.1.5 | Data Structures & Programming Lab | - | 3 | 3 | 50 | 50 | 100 | 2 |
| CSEMT.1.1.6 | Database Management Systems Lab | - | 3 | 3 | 50 | 50 | 100 | 2 |
| CSEMT.1.1.7 | | | | | | | | |
| | Total | | | 24 | 280 | 520 | 800 | 28 |

## Semester – II

| CODE NO | SUBJECT NAME | Periods | | | Sessional Marks | External Marks | Total | Credits |
|---|---|---|---|---|---|---|---|---|
| | | Theory | Lab | Total | | | | |
| CSEMT.1.2.1 | Artificial Intelligence | 3 | - | 3 | 30 | 70 | 100 | 4 |
| CSEMT.1.2.2 | Object Oriented Software Engineering | 3 | - | 3 | 30 | 70 | 100 | 4 |
| CSEMT.1.2.3 | Compiler Design | 3 | - | 3 | 30 | 70 | 100 | 4 |
| CSEMT.1.2.4 | Data ware Housing &Data Mining | 3 | - | 3 | 30 | 70 | 100 | 4 |
| CSEMT.1.2.5 | Elective I | 3 | - | 3 | 30 | 70 | 100 | 4 |
| CSEMT.1.2.6 | Elective II | 3 | - | 3 | 50 | 50 | 100 | 4 |
| CSEMT.1.2.7 | Network Programming &Web Programming Lab | - | 3 | 3 | 50 | 50 | 100 | 2 |
| CSEMT.1.2.8 | OOSE Lab | - | 3 | 3 | 50 | 50 | 100 | 2 |
| CSEMT.1.2.9 | | | | | | | | |
| | Total | | | 24 | 300 | 500 | 800 | 28 |

**Elective I:** Parallel Programming/Image Processing/Semantic Web/Embedded Systems/ Computer Vision/ Computer Graphics &Visual Computing /Big Data Analysis

**Elective II**: Cloud Computing/ Mobile Computing/Soft Computing/ Grid Computing/Cluster Computing/Pervasive Computing

# Semester – III

| CODE NO | SUBJECT NAME | Periods | | | Sessional Marks | External Marks | Total | Credits |
|---|---|---|---|---|---|---|---|---|
| | | Theory | Lab | Total | | | | |
| CSE 2.1.1 | Seminar | - | - | - | 100 | - | 100 | 2 |
| CSE 2.1.2 | Thesis Work Part 1 | - | - | - | GRADE | | GRADE | 10 |
| | ***Total*** | | | | | | | ***12*** |

# Semester – IV

| CODE NO | SUBJECT NAME | Periods | | | Sessional Marks | External Marks | Total | Credits |
|---|---|---|---|---|---|---|---|---|
| | | Theory | Lab | Total | | | | |
| CSE 3.1.1 | Seminar | - | - | - | 100 | | 100 | 2 |
| CSE 3.1.2 | Thesis Work Part II | - | - | - | | GRADE | 0 | 15 |
| | ***Total*** | | | | | | | ***17*** |

# M.E. (Control Systems)
## 2 Year PG Degree Course

## Semester – I

| Subject Code | Subject Title | Credits | Periods/Week | | Sessional Marks | Univ. exam marks | Total |
|---|---|---|---|---|---|---|---|
| | | | Theory | Lab | | | |
| ECS 1.1 | Advanced Control Systems | 4 | 4 | -- | 30 | 70 | 100 |
| ECS 1.2 | Optimization Techniques | 4 | 4 | -- | 30 | 70 | 100 |
| ECS 1.3 | Advanced Drives and Control | 4 | 4 | -- | 30 | 70 | 100 |
| ECS 1.4 | Advanced Control System Design | 4 | 4 | -- | 30 | 70 | 100 |
| ECS 1.5 | Elective-I | 4 | 4 | -- | 30 | 70 | 100 |
| ECS 1.6 | Control System Simulation Lab-I | 3 | - | 3 | 100 | -- | 100 |
| Total | | 23 | 20 | 3 | 250 | 350 | 600 |

ECS 1.5 ELECTIVE –I:

(a) Large Scale Systems
(b) Digital Control Systems
(c) Robust and Adaptive Control

## Semester – II

| Subject Code | Subject Title | Credits | Periods/Week | | Sessional Marks | Univ. exam marks | Total |
|---|---|---|---|---|---|---|---|
| | | | Theory | Lab | | | |
| ECS 2.1 | Nonlinear Control Systems | 4 | 4 | -- | 30 | 70 | 100 |
| ECS 2.2 | Sliding Mode Control Theory | 4 | 4 | -- | 30 | 70 | 100 |
| ECS 2.3 | Intelligent Systems and Control | 4 | 4 | -- | 30 | 70 | 100 |
| ECS 2.4 | Optimal Control Theory | 4 | 4 | -- | 30 | 70 | 100 |
| ECS 2.5 | Elective-II | 4 | 4 | -- | 30 | 70 | 100 |
| ECS 2.6 | Control System Simulation Lab-II | 3 | - | 3 | 100 | -- | 100 |
| Total | | 23 | 20 | 3 | 250 | 350 | 600 |

ECS 2.5 ELECTIVE –II:

(a) Control Systems Components
(b) Control of Large Scale Systems
(c) Robotics

## SEMESTER III and IV: THESIS WORK

Work load : 6 Periods/Week/Student
Credits per Semester : 15
Total Credits : 30

**The valuation of the thesis credits should be allotted but for the calculation of CGPA these credits will not be taken into consideration.**

Candidates can do their work in the department or in any industry/research organization for two semesters (i.e 3rd and 4th semesters). In case of thesis to be done in an industry / research organization, the advisor / advisors should be from the industry / research organization.

**It is mandatory that two seminars at least one per semester related to thesis work / general topic in III and IV semesters and publication of a paper in conference proceeding / communicated to Journal for the submission of the Thesis at the end of 4th Semester.**

At the end of 4th semester, four spiral bound copies of the thesis are to be submitted to the department, out of which 2 to be retained by the department for evaluation purpose. The thesis is to be evaluated by an examiner external to the University with minimum M.E./M.Tech qualification with relevant specialization and must have minimum 5 years of experience in service.

A Viva-voce examination is to be conducted by a Committee consisting of Head of the department of respective college, Chairman, Board of Studies, the External Examiner who evaluates the thesis and the Advisor of the thesis, after receiving the evaluation report from the External Examiner.

In case the advisor happens to be HOD or Chairman, Board of Studies or from industry / research organization one more member from the department with relevant specialization is to be recommended as examiner by Chairman, Board of Studies for Viva-voce examination.

The Board will submit a report stating whether the thesis **is approved with grade (A – Excellent, B – Good, C – Fair, D-reappear for viva-voce) / not approved.**

# M.E. (Machine Design)
## 2 Year PG Degree Course

## Semester – I

| Course No. | Subject Title | Periods per week | | Exam (Hrs) | Max. marks | | Credits |
|---|---|---|---|---|---|---|---|
| | | Lec. | Lab | | Exam | Sess. | |
| 1 | Theory of Elasticity and Plasticity | 3 | — | 3 | 70 | 30 | 3 |
| 2 | Advanced Mechanics of Solids | 3 | — | 3 | 70 | 30 | 3 |
| 3 | Mechanics of Machinery | 3 | — | 3 | 70 | 30 | 3 |
| 4 | Advanced Optimization Techniques | 3 | — | 3 | 70 | 30 | 3 |
| 5 | Design Engineering | 3 | — | 3 | 70 | 30 | 3 |
| 6 | Elective-I | 3 | — | 3 | 70 | 30 | 3 |
| 7 | CAD Lab | — | 3 | — | — | 50 | 2 |
| 8 | Seminar | — | 3 | — | — | 50 | 2 |
| Total | | 18 | 6 | — | 420 | 280 | 22 |

## Semester – II

| Course No. | Subject Title | Periods per week | | Exam (Hrs) | Max. marks | | Credits |
|---|---|---|---|---|---|---|---|
| | | Lec. | Lab | | Exam | Sess. | |
| 1 | Mechanical Vibrations | 3 | — | 3 | 70 | 30 | 3 |
| 2 | Instrumentation & Experimental Stress Analysis | 3 | | 3 | 70 | 30 | 3 |
| 3 | Finite Element Analysis | 3 | — | 3 | 70 | 30 | 3 |
| 4 | Robotics | 3 | — | 3 | 70 | 30 | 3 |
| 5 | Elective – II | 3 | — | 3 | 70 | 30 | 3 |
| 6 | Elective – III | 3 | — | 3 | 70 | 30 | 3 |
| 7 | Instrumentation & Experimental Stress Analysis Lab | — | 3 | — | — | 50 | 2 |
| | | | | | | | |
| Total | | 18 | 3 | — | 420 | 230 | 20 |

**Elective–I:** A. Integrated Computer Aided Design B. Pressure Vessel Design
C. Fatigue, Creep & Fracture Mechanics D. Gear Engineering

**Elective–II:** A. Signal analysis & Condition Monitoring B. Composite Materials
C. Theory of Plates and Shells D. Vehicle Dynamics

**Elective–III:** A. Concurrent Engineering B. Mechatronics
C. Computational Fluid Dynamics D. Tribology

# Semester – III

| Course No. | Subject Title | Periods per week | Exam (Hrs) | Max. marks | | Credits |
|---|---|---|---|---|---|---|
| | | | | Exam | Sess. | |
| 1 | Project Seminar | 12 | — | — | 50 | 2 |

# Semester – IV

| Course No. | Subject Title | Periods per week | Duration of exam (hours) | Max. marks | Credits |
|---|---|---|---|---|---|
| | | | | Exam | |
| 1 | Project | 12 | — | Recommended/Not recommended | 14 |

The prerequisite for submission of the ME thesis is that one should communicate his/her work to any referred journal or Publication in a conference.

# M.Tech. (Biotechnology)
# 2 Year PG Degree Course

## Semester – I

| Subject Title | L | P | Total Hours | Sessional | Exam | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| MBIO- 101: Introductory Biology/Introductory Mathematics | 4 | - | 4 | 30 | 70 | 100 | 3 |
| MBIO- 102: Chemical Engineering Principles | 4 | - | 4 | 30 | 70 | 100 | 3 |
| MBIO- 103: Molecular Biology | 4 | - | 4 | 30 | 70 | 100 | 3 |
| MBIO- 104: Microbial Chemistry | 4 | - | 4 | 30 | 70 | 100 | 3 |
| MBIO- 105 : Immunology | 4 | - | 4 | 30 | 70 | 100 | 3 |
| MBIO- 106: Seminar/Journal Club/Assignment | | 3 | 3 | 100 | - | 100 | 1 |
| MBIO- 107: Lab-1: Biochemistry and Analytical Techniques | | 3 | 3 | 50 | 50 | 100 | 4 |
| MBIO- 108: Lab-2: Microbiology & Immunology | | 3 | 3 | 50 | 50 | 100 | 4 |
| Total | | | | | | | 24 |

## Semester – II

| Subject Title | L | P | Total Hours | Sessional | Exam | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| MBIO- 201: Genetic Engineering | 4 | - | 4 | 30 | 70 | 100 | 3 |
| MBIO- 202: Bioprocess Engineering and Technology | 4 | - | 4 | 30 | 70 | 100 | 3 |
| MBIO- 203: Biostatistics | 4 | - | 4 | 30 | 70 | 100 | 3 |
| MBIO- 204: Downstream Processing | 4 | - | 4 | 30 | 70 | 100 | 3 |
| MBIO- 205 : Elective I | 4 | - | 4 | 30 | 70 | 100 | 3 |
| MBIO- 206: Project Seminar /Journal Club/Assignment | | 3 | 3 | 100 | - | 100 | 1 |
| MBIO- 207: Lab-IV: Genetic Engineering | | 6 | 6 | 50 | 50 | 100 | 4 |
| MBIO- 208: Lab-V: Downstream Processing | | 3 | 3 | 50 | 50 | 100 | 4 |
| Total | | | | | | | 24 |

# Semester – III

| Subject Title | L | P | Total Hours | Sessional | Exam | Total Marks | Credits |
|---|---|---|---|---|---|---|---|
| MBIO- 301: Applied Bioinformatics | 4 | - | 4 | 30 | 70 | 100 | 3 |
| MBIO- 302: Bioprocess Plant Design | 4 | - | 4 | 30 | 70 | 100 | 3 |
| MBIO- 303: IPR & Bio-safety | 4 | - | 4 | 30 | 70 | 100 | 3 |
| MBIO- 304: Elective II | 4 | - | 4 | 30 | 70 | 100 | 3 |
| MBIO- 305 : Lab VI: Bioreactor Operations | | 3 | 3 | 50 | 50 | 100 | 4 |
| MBIO- 306: Project Proposal Presentation & Initiation | 4 | - | 12 | 100 | - | 100 | 7 |
| Total | | | | | | | 23 |

# Semester – IV

MBIO-401: Project Work & Viva-Voce 23