



# Programme Specifications

M. Tech. Programme

Programme:  
Automotive Engineering

Department:  
Aerospace Engineering

Faculty of Engineering & Technology  
M.S. Ramaiah University of Applied Sciences

University House, New BEL Road, MSR Nagar, Bangalore – 560 054

[www.msruas.ac.in](http://www.msruas.ac.in)

**Programme Specification**

| <b>Programme: M. Tech. in Automotive Engineering</b> |                                         |
|------------------------------------------------------|-----------------------------------------|
| Faculty                                              | Faculty of Engineering                  |
| Department                                           | Automotive and Aeronautical Engineering |
| Programme                                            | M.Tech in Automotive Engineering        |
| Dean of Faculty                                      | Prof. Arulanantham M                    |
| HOD                                                  | Prof. Raja R                            |

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|  | <b>1. Title of the Award</b>                                           |
|  | M. Tech. in Automotive Engineering                                     |
|  | <b>2. Modes of study</b>                                               |
|  | Full Time                                                              |
|  | <b>3. Awarding Institution / Body</b>                                  |
|  | M. S. Ramaiah University of Applied Sciences – Bengaluru, India        |
|  | <b>4. Joint Award</b>                                                  |
|  | --                                                                     |
|  | <b>5. Teaching Institution</b>                                         |
|  | Faculty of Engineering & Technology                                    |
|  | M S Ramaiah University of Applied Sciences - Bengaluru, India          |
|  | <b>6. Date of Programme Specification</b>                              |
|  | March 2019                                                             |
|  | <b>7. Date of Programme Approval by the Academic Council of MSRUAS</b> |
|  | July 2019                                                              |
|  | <b>8. Next Review Date</b>                                             |
|  | May 2021                                                               |
|  | <b>9. Programme Approving Regulatory Body and Date of Approval</b>     |
|  | --                                                                     |
|  | <b>10. Programme Accrediting Body and Date of Accreditation</b>        |
|  | --                                                                     |
|  | <b>11. Grade Awarded by the Accreditation Body</b>                     |
|  | --                                                                     |
|  | <b>12. Programme Accreditation Validity</b>                            |
|  | --                                                                     |
|  | <b>13. Programme Benchmark</b>                                         |
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|--|----------------------------------------|
|  | <b>14. Rationale for the Programme</b> |
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|  | <p>Mobility plays an important role in the development of economy of the world. Particularly, the road transport is very important for day to day movement of people and goods. It is estimated that there will be 1.4 billion vehicles on road by 2020 and around a 50% of them in non OECD countries including India and China. Though the road vehicles have a history of more than a century, the development of newer vehicles, creating new designs, improving the existing designs, adoption of new materials and manufacturing methods and introduction of new technologies to improve their performance is a continuing process.</p> <p>The road transport vehicles are automobiles and commercial vehicles. Normally, we refer the personal transport vehicles as automobiles and the bigger vehicles used for transportation of goods and public as commercial vehicles. Developed countries like the USA, the UK, Germany, France, Italy, Sweden, Japan and South Korea have made a mark in design and production of road vehicles. Automotive companies like GM, Ford, Chrysler, Jaguar, Daimler-Benz, BMW, Volkswagen, Renault, Volvo, Toyota, Honda, Suzuki, Nissan, Hyundai, Tata Motors, Mahindra and Mahindra are well known worldwide. Almost all of these companies have established their operations in India too. In addition, companies which provide technology support for automobile development like Robert Bosch, Delphi, Continental and a number of engineering service companies are operating in India. India is one of the largest two wheeler producers in the world; Hero Motors, Bajaj, TVS Motors are the famous two wheeler manufacturers in India.</p> <p>These companies are involved in development of technologies to meet stringent emission norms, development of systems for electric and autonomous vehicles, safety standards and ease of driving with more comfort.</p> <p>Automotive companies have been recruiting a considerable number of graduates in India for the last 8-9 years. Each company recruits around 200-800 fresh engineering graduates annually and 25 % of them are postgraduates specialized in automotive engineering.</p> <p>It is the primary responsibility of the universities to produce quality graduates to sustain growth of automobile sector. The department has been offering automotive engineering programme at the postgraduate level since 2001. The programme focuses on automotive structural design, analysis, evaluation, development and physical testing of automotive systems. The programme teaches courses like modern automotive systems, powertrain, vehicle dynamics, handling and simulation, noise, vibration and harshness, structural safety and impact, electric and hybrid electric vehicle, Intelligent vehicle technology, vehicle aerodynamics and thermal management and modern CAE methods. The graduates are getting opportunities in the well-known automotive companies mentioned earlier; a few of them are taking entrepreneurship route and many of them have taken research route for growth.</p> <p>In fact, Automotive Engineering is one of the flagship courses of Faculty of Engineering and Technology of MSRUAS. Over the years, the department has grown intellectually as well, created excellent infrastructure and has developed a reputation amongst students, parents, industry and research sponsors.</p> <p>The faculty of engineering and technology plans for further development of automotive engineering programme and compete with the best universities in the world and attract high quality graduates as well as teaching talent from all over the country and abroad.</p> |
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**15. Programme Aim**

The aim of the programme is to produce postgraduates with advanced knowledge and understanding of automotive engineering; higher order critical, analytical, problem solving and transferable skills; ability to think rigorously and independently to meet higher level expectations of automotive industry, academics, research or take up entrepreneurial route.

**16. Programme Objectives**

Students will be able to apply the knowledge, understanding and skills acquired to carry out automotive engineering design, simulation, analysis, synthesis and evaluation of components/systems. Emphasis will be placed on imaginative and creative approach to automotive engineering design and development.

The objectives of the programme are to enable the students to:

1. Knowledge and understanding of construction, working principles and functional requirements of modern automotive systems
2. Design, model, simulate, analyze and validate automobile components / systems
3. Selection of materials and manufacturing processes for automobile components and systems
4. Evaluating the performance of automotive components/systems by conducting physical test
5. Analysis of automobile components and systems using modern CAD, CAE, CFD and MBD tools
6. Developing a project activities giving general perspective and opportunities for a career in the automotive industry
7. Teamwork, lifelong learning and continuous improvement

**17. Intended Learning Outcomes of the Programme**

The Intended Learning Outcomes (ILOs) are listed under four headings:

1. Knowledge and Understanding, 2. Cognitive Skills 3. Practical Skills and 4. Capability / Transferable Skills.

**1. Knowledge and Understanding**

After undergoing this programme, a student will be able to:

- KU1:** Explain working, theoretical principles and design of various automotive systems
- KU2:** Describe the critical factors in designing automotive body structures for their structural, handling and safety requirements
- KU3:** Explain the design requirements for passenger comfort in terms of ride, noise, vibration and harshness, their causes and methods of mitigation
- KU4:** Discuss advantages, disadvantages and limitations of various materials and manufacturing processes used in automotive application

**2. Cognitive Skills**

After undergoing this programme, a student will be able to:

- CS1:** Design and analyse various sub systems/components of an automobile to meet the overall specifications of the vehicle
- CS2:** Analyse and propose design changes essential for mitigation of NVH, improved vehicle performance and ride and handling during the development phase of the vehicle
- CS3:** Evaluate the performance of the vehicle and its subsystems
- CS4:** Design and analyse the structure for the safety of the occupants and pedestrians in case of a crash/impact

### 3. Practical Skills

After undergoing this programme, a student will be able to:

- PS1:** Create 3D geometric models, surface models and manufacturing drawings using standard CAE tools
- PS2:** Create Finite Element, CFD and kinematic and Dynamic analysis models using CAE tools
- PS3:** Conduct physical tests to evaluate performance of automotive components, subsystems and system
- PS4:** Perform vehicle dynamic tests to evaluate the performance of the vehicle

### 4. Capability / Transferable Skills

After undergoing this programme, a student will be able to:

- TS1:** Manage information, develop technical reports and make presentations
- TS2:** Build, Manage and Lead a team to successfully complete a project and communicate across teams and organizations to achieve professional objectives
- TS3:** Work under various constraints to meet project targets
- TS4:** Adopt to the chosen profession by continuously upgrading his/her knowledge and understanding through Life-long Learning philosophy

### 18. Programme Structure

The Programme consists of four terms as shown below. A student is required to successfully complete the following courses and earn credits for the award of the degree.  
Complete details of each of the courses such as ILO's, content, resources, teaching-learning processes and other related information are outlined in Course Specification of the respective programme.

| <b>SEMESTER</b>                               |                    | <b>1</b>                                         | <b>hours (h/W/S)</b> |                 |                  | <b>Credits</b> | <b>Max. Marks</b> |
|-----------------------------------------------|--------------------|--------------------------------------------------|----------------------|-----------------|------------------|----------------|-------------------|
| <b>Sl. No</b>                                 | <b>Course Code</b> | <b>Name of the Course</b>                        | <b>Theory</b>        | <b>Tutorial</b> | <b>Practical</b> |                |                   |
| 1                                             | 19AUC501A          | Modern Automotive Systems                        | 4                    | 0               | 0                | 4              | 100               |
| 2                                             | 19AUC502A          | Automotive Materials and Manufacturing Processes | 4                    | 0               | 0                | 4              | 100               |
| 3                                             | 19AUC503A          | Noise, Vibration and Harshness                   | 4                    | 0               | 0                | 4              | 100               |
| 4                                             | 19AUC504A          | Vehicle Dynamics, Handling and Simulation        | 3                    | 1               | 2                | 5              | 100               |
| 5                                             | 19AUC505A          | Computer Aided Engineering                       | 3                    | 1               | 2                | 5              | 100               |
| 6                                             | 19FET508A          | Research Methodology and IPR                     | 2                    | 0               | 0                | 2              | 50                |
| 7                                             | 19FET509A          | Professional Communication                       | 2                    | 0               | 0                | 0              | 0                 |
| <b>Total</b>                                  |                    |                                                  | 21                   | 2               | 5                | <b>24</b>      | <b>550</b>        |
| <b>Total Number of Contact Hours per Week</b> |                    |                                                  | <b>28</b>            | Hours           |                  |                |                   |
| <b>Number of Credits can be registered</b>    |                    |                                                  | Minimum              | <b>18</b>       | Maximum          | <b>24</b>      |                   |

**SEMESTER : 2**

| Sl. No                                        | Course Code | Name of the Course                          | hours (h/W/S) |           |           | Credits   | Max. Marks |
|-----------------------------------------------|-------------|---------------------------------------------|---------------|-----------|-----------|-----------|------------|
|                                               |             |                                             | Theory        | Tutorial  | Practical |           |            |
| 1                                             | 19AUC506A   | Vehicle Aerodynamics and Thermal Management | 4             | 0         | 0         | 4         | 100        |
| 2                                             | 19AUE5X1A   | Professional Elective -1                    | 4             | 0         | 0         | 4         | 100        |
| 3                                             | 19AUE5X2A   | Professional Elective -2                    | 4             | 0         | 0         | 4         | 100        |
| 4                                             | 19AUE5X3A   | Professional Elective -3                    | 4             | 0         | 0         | 4         | 100        |
| 5                                             | 19AUE5X4A   | Professional Elective -4                    | 4             | 0         | 0         | 4         | 100        |
| 6                                             | 19FET510A   | Value Education                             | 2             | 0         | 0         | 0         | 0          |
| <b>Total</b>                                  |             |                                             | 22            | 0         | 4         | <b>20</b> | <b>500</b> |
| <b>Total Number of Contact Hours per Week</b> |             |                                             | <b>24</b>     | Hours     |           |           |            |
| <b>Number of Credits can be registered</b>    |             |                                             | Minimum       | <b>16</b> | Maximum   |           | <b>20</b>  |

**SEMESTER 3**

| Sl.No.                                        | Code      | Course Title                         | Theory (h/W/S)  | Tutorials (h/W/S) | Practical (h/W/S) | Total Credits | Max. Marks |
|-----------------------------------------------|-----------|--------------------------------------|-----------------|-------------------|-------------------|---------------|------------|
| 1                                             | 19AUP521A | Internship                           |                 |                   | 10                | 4             | 100        |
| 2                                             | 19AUP522A | Group project                        |                 |                   | 15                | 8             | 200        |
| 3                                             | 19AUP523A | Dissertation and Publication Phase 1 |                 |                   |                   |               |            |
| <b>Total</b>                                  |           |                                      |                 |                   | <b>25</b>         | <b>12</b>     | <b>300</b> |
| <b>Total number of contact hours per week</b> |           |                                      | <b>25 hours</b> |                   |                   |               |            |
| <b>Number of credits can be registered</b>    |           |                                      | Minimum         | <b>12</b>         | Maximum           | <b>12</b>     |            |

**SEMESTER 4**

| Sl.No.                                        | Code      | Course Title                 | Theory (h/W/S)  | Tutorials (h/W/S) | Practical (h/W/S) | Total Credits | Max. Marks |
|-----------------------------------------------|-----------|------------------------------|-----------------|-------------------|-------------------|---------------|------------|
| 1                                             | 19AUP524A | Dissertation and Publication |                 |                   | 24                | 24            | 400        |
| <b>Total</b>                                  |           |                              |                 |                   | <b>24</b>         | <b>24</b>     | <b>400</b> |
| <b>Total number of contact hours per week</b> |           |                              | <b>24 hours</b> |                   |                   |               |            |
| <b>Number of credits can be registered</b>    |           |                              | Minimum         | <b>24</b>         | Maximum           | <b>24</b>     |            |

| Elective Courses List       |             |                                                     |
|-----------------------------|-------------|-----------------------------------------------------|
| Stream / Specialization     | Course Code | Course Title                                        |
| Automotive Product Design   | 19AUE511A   | Elements of Design for Automotive Products          |
|                             | 19AUE512A   | Automotive Concepts and Product Development Process |
|                             | 19AUE513A   | Automotive Interior and Exterior Design             |
|                             | 19AUE514A   | Automotive Product Visualization and Animation      |
| Automotive System Design    | 19AUE521A   | Automotive Structures and Occupant's Safety         |
|                             | 19AUE522A   | Automotive Powertrain                               |
|                             | 19AUE523A   | Intelligent Vehicle Technology                      |
|                             | 19AUE524A   | Automotive System Design                            |
| Advanced Vehicle Technology | 19AUE531A   | Electric and Hybrid Vehicle                         |
|                             | 19AUE532A   | Energy Storage Systems                              |
|                             | 19AUE523A   | Intelligent Vehicle Technology                      |
|                             | 19AUE534A   | Electric Vehicle Structures and Safety              |

### 19. Programme Delivery Structure

A Programme is delivered from Monday to Saturday of the week as per the Time-Table for every batch.

### 20. Teaching and Learning Methods

The course delivery comprises of a combination of few or all of the following:

1. Face to Face Lectures using Audio-Visuals
2. Workshops, Group Discussions, Debates, Presentations
3. Demonstrations
4. Guest Lectures
5. Laboratory/Field work/Workshop
6. Industry Visit
7. Seminars
8. Group Exercises
9. Project Exhibitions
10. Technical Festivals

### 21. Courses

Programme has six Professional core courses, four Professional elective courses, two audit courses, and one compulsory course followed by Group Project, Internship and Dissertation & Publication courses.

Core courses are Programme Specialization courses which normally include both theory and laboratory sessions. Alternate activities are planned in case of laboratory sessions do not exist in a course.

Compulsory course is Research Methodology and IPR course which is mandatory.

All courses of the programmes are categorized as indicated in the **Annexure I**.

### 22. Electives

There are four electives in the programme. The electives are grouped such a way that a student can choose a set of electives to specialize in a chosen field/stream. However, if the student wishes to opt for elective course that spans multiple streams, the case may be considered subject to the affordability of academic logistics and approval by the course leader, HODs and Deans.

For every elective offered, there will be a minimum and a maximum number of registrations that is decided by the department.

There is also a provision for the students to choose 3<sup>rd</sup> and 4<sup>th</sup> electives through on-line mode such as MOOC's, SWAYAM, NPTEL and other equivalent platforms. The guidelines prescribed by the University for such courses to be adhered to. The student can also earn 3 or 4 credits by participating in the international competitions like technical presentation/ conference/ publications in the journal etc and winning the award in that. In that case he/she can be exempted from one of the elective courses of the programme.

**23. Group Project**

The main objective of group project is to provide an ambiance to work in groups towards achieving a common goal. A group shall have up to 5 students. In case of Group Project work is based on inter-disciplinary in nature, team can be constituted with members from across departments of the Faculty.

The students are required to develop a report for assessment and also need to demonstrate the working of the product. The IPR rights of all such work lies with the University only. The project should be approved by a committee constituted by respective HoDs before the start of the project. For further details related to the Group Project refer to Course Specification of the respective programmes

**24. Industry Internship/Other Activities**

A student can opt for an internship in an industry, a business or research organization during the course.

Alternately, can undertake a mini-project requiring self-directed study that can be perused within the affiliated Faculty.

Prior approval of the internship / mini-project by the HoD and Dean is mandatory. It is also necessary for the student to submit a report and make a presentation to the members of the panel constituted by the HoD for assessment.

For further details related to this course, please refer to Course Specification of the respective programmes.

**25. Dissertation and Publication**

This course has two parts – Dissertation and Publication.

Every student, has to undertake the dissertation work individually on a chosen relevant topic. The topic needs to be approved by the committee constituted by HoD.

Publication is a stage wherein dissertation work of the student is converted into a technical paper to be published in reputed conferences/journals.

For further details related to the this course refer to Course Specifications of the respective programmes

**26. Course Assessment**

1. Every course will be assessed for a weight of 100%
2. There are two components-Component-1 and Component-2
3. Component-1 carries a weight of 50% and Component -2 carries a weight of 50%
4. Component -1 (CE) is subdivided into Term Tests , Assignments and laboratory examinations/ technical presentation

**a. For the courses having 100% theory**

There are two components-Component-1 and Component-2

Component-1 (CE) carries a weight of 50% and Component -2 (SEE) carries a weight of 50%

**Component-1 (CE): 50% weight:**

The course leader will indicate the mode of assessment in consultation and approval of the respective HoD and the faculty Dean, before commencement of the semester.

The template for weightage of CE and SEE in percentages for each theory course is indicated in Table below.

| ILO No. | Intended Learning Outcome | CE (Weightage: 50 %) |         |         |         | SEE               |
|---------|---------------------------|----------------------|---------|---------|---------|-------------------|
|         |                           | Assessment Type      | Comp-1a | Comp-1b | Comp-1c | (Weightage: 50 %) |
|         |                           | Comp Weightage (%)   | xx      | xx      | xx      | SEE               |
| 1       | ILO-1                     |                      |         |         |         |                   |
| 2       | ILO-2                     |                      |         |         |         |                   |
| 3       | ILO-3                     |                      |         |         |         |                   |
| 4       | ILO-4                     |                      |         |         |         |                   |
| 5       | ILO-5                     |                      |         |         |         |                   |
| 6       | ILO-6                     |                      |         |         |         |                   |

CE – can be from any combination of the following:

Assignments, term Tests, Seminars, Tech Talks, Mini-Projects, Case-Studies, Self-Study, others, if any.

**b. For courses with a combination of theory and laboratory**

There are two components-Component-1 and Component-2

Component-1 (CE) carries a weight of 50% and Component -2 (SEE) carries a weight of 50%.

**Component-1 (CE): 50% weight**

The course leader will indicate the mode of assessment in consultation and approval of the respective HoD and the faculty Dean, before commencement of the semester.

The template for weightage of CE and SEE in percentages for each course is indicated in Table below.

| ILO No. | Intended Learning Outcome | CE (Weightage: 50 %) |         |         |             | SEE               |
|---------|---------------------------|----------------------|---------|---------|-------------|-------------------|
|         |                           | Assessment Type      | Comp-1a | Comp-1b | Comp-1c Lab | (Weightage: 50 %) |
|         |                           |                      |         |         |             | SEE               |
|         |                           | Comp Weightage (%)   | xx      | xx      | xx          | 50                |
| 1       | ILO-1                     |                      |         |         |             |                   |
| 2       | ILO-2                     |                      |         |         |             |                   |
| 3       | ILO-3                     |                      |         |         |             |                   |
| 4       | ILO-4                     |                      |         |         |             |                   |
| 5       | ILO-5                     |                      |         |         |             |                   |
| 6       | ILO-6                     |                      |         |         |             |                   |

CE – can be from any combination of the following:

Assignments, term Tests, Seminars, Tech Talks, Mini-Projects, Case-Studies, Self-Study, others,

5. Component -2 (SEE) is Written Examination for 100 Marks. It will be reduced to 50 Marks.
6. A minimum of overall 40% is required for a pass with 40% in each of the Components
7. The marks distribution for each course is given in the programme structure-section 18. Other flexibilities(exceptions) as per the programme regulations.

## 27. Failure in Course and Makeup Examinations

Makeup Examinations are provided for the students who are not able to meet all pass criteria prescribed for a course during the regular term and fail in the course.

For further details related to makeup examination, please refer to M.Tech. Programme Academic Regulations document.

## 28. Attendance

Please refer to M.Tech. Programme Academic Regulations document for attendance requirements and condonation related details.

## 29. Award of Grades

As per the M.Tech. Programme Academic Regulations document.

## 30. Student Support for Learning

Students are provided with various facilities to support learning such as the following:

1. Course notes
2. Reference books in the library
3. Magazines and Journals
4. Internet facility
5. Computing facility
6. Laboratory facility
7. Workshop facility
8. Staff support
9. Lounges for discussions
10. Any other support that enhances their learning

**31. Quality Control Measures**

Following are the Quality Control Measures:

1. Review of course notes
2. Review of question papers and assignment questions
3. Student Feedback Analysis
4. Moderation of assessed work
5. Opportunities for the students to see their assessed work
6. Review by external examiners and external examiners reports
7. Staff Student Consultative Committee meetings
8. Student exit feedback analysis
9. Subject Assessment Board (SAB)
10. Programme Assessment Board (PAB)

**32. Curriculum Map**

| Course Code | Intended Learning Outcomes  |     |     |     |                                                                                    |     |     |     |                  |     |     |     |
|-------------|-----------------------------|-----|-----|-----|------------------------------------------------------------------------------------|-----|-----|-----|------------------|-----|-----|-----|
|             | Knowledge and Understanding |     |     |     | Cognitive (Thinking) Skills<br>(Critical, Analytical, Problem Solving, Innovation) |     |     |     | Practical Skills |     |     |     |
|             | KU1                         | KU2 | KU3 | KU4 | CS1                                                                                | CS2 | CS3 | CS4 | PS1              | PS2 | PS3 | PS4 |
| 19AUC501A   | X                           |     | X   | X   |                                                                                    |     |     |     |                  |     |     |     |
| 19AUC502A   |                             |     |     | X   | X                                                                                  |     |     |     |                  |     | X   |     |
| 19AUC503A   | X                           |     | X   |     |                                                                                    | X   |     |     |                  | X   |     | X   |
| 19AUC504A   | X                           | X   |     |     |                                                                                    | X   | X   |     |                  | X   |     | X   |
| 19AUC505A   |                             | X   |     |     |                                                                                    | X   |     |     | X                | X   |     |     |
| 19AUC506A   | X                           |     |     |     | X                                                                                  |     | X   |     |                  | X   | X   |     |
| 19AUE5xxA   | X                           | X   | X   |     |                                                                                    | X   | X   | X   | X                | X   | X   |     |
| 19AUP522A   |                             | X   |     |     | X                                                                                  | X   | X   |     | X                | X   | X   | X   |
| 19AUP521A   | X                           |     |     |     | X                                                                                  | X   | X   |     | X                | X   |     |     |
| 19AUP524A   |                             |     |     |     | X                                                                                  | X   | X   |     | X                | X   | X   | X   |

**33. Capability / Transferable Skills Map**

| Course Code    | Group work | Self-learning | Research Skills | Written Communication Skills | Verbal Communication Skills | Presentation Skills | Behavioral Skills | Information Management | Personal management/ Leadership Skills |
|----------------|------------|---------------|-----------------|------------------------------|-----------------------------|---------------------|-------------------|------------------------|----------------------------------------|
| 19AUC501A      |            | X             |                 | X                            | X                           | X                   |                   | X                      |                                        |
| 19AUC502A      |            | X             | X               | X                            | X                           | X                   |                   | X                      |                                        |
| 19AUC503A      |            | X             | X               | X                            | X                           | X                   |                   | X                      |                                        |
| 19AUC504A      |            | X             | X               | X                            | X                           | X                   |                   | X                      |                                        |
| 19AUC505A      |            | X             | X               | X                            | X                           | X                   |                   | X                      |                                        |
| 19AUC506A      | X          | X             | X               | X                            | X                           |                     | X                 | X                      | X                                      |
| 19AUE5xxA      | X          | X             | X               | X                            | X                           | X                   | X                 | X                      | X                                      |
| 19AUP522A      | X          | X             | X               | X                            | X                           | X                   | X                 | X                      | X                                      |
| 19AUP521A      | X          | X             | X               | X                            | X                           | X                   | X                 | X                      | X                                      |
| 19AUP524A      | X          | X             | X               | X                            | X                           | X                   | X                 | X                      | X                                      |
| 19FET508A      |            | X             | X               |                              |                             | X                   | X                 | X                      | X                                      |
| 19FET509A/510A | X          | X             | X               | X                            | X                           | X                   | X                 | X                      | X                                      |

**34. Co-curricular Activities**

Students are encouraged to take part in co-curricular activities like seminars, conferences, symposium, paper writing, attending industry exhibitions, project competitions and related activities to enhance their knowledge and network.

**35. Cultural and Literary Activities**

To remind and ignite the creative endeavors, annual cultural festivals are held and the students are made to plan and organize the activities.

**36. Sports and Athletics**

Students are encouraged to develop a habit of taking part in outdoor and indoor games on regular basis.

