

MVJ College of Engineering, Whitefield, Bangalore

An Autonomous Institution, Affiliated to VTU, Belagavi

Scheme of Teaching and Examination 2019-20

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

Effective from the academic year 2020-21

I SEMESTER M.TECH- (Aeronautical Engineering)

| S No | Course | | Teaching Department | Teaching hours/week | | | Examination | | | | Credits | |
|------|--------|-------------|---------------------|--|--------------|---------------------|-------------------|-----------|-----------|-------------|---------|----|
| | Type | Code | | Course Title | Course Title | Teaching Department | Duration in Hours | CIE Marks | SEE Marks | Total marks | | |
| | L | T | P | Theory | Tutorial | Practical/Drawing | | | | | | |
| 1 | PC | MVJ20MAE11 | AE | Applied Mathematics | 3 | 2 | - | 3 | 50 | 50 | 100 | 4 |
| 2 | PC | MVJ20MAE12 | AE | Applied Computational Fluid Dynamics | 3 | 2 | - | 3 | 50 | 50 | 100 | 4 |
| 3 | PC | MVJ20MAE13 | AE | Aerodynamics | 3 | 2 | - | 3 | 50 | 50 | 100 | 4 |
| 4 | PC | MVJ20MAE14 | AE | Introduction to Aerospace Vehicles and Systems | 3 | - | - | 3 | 50 | 50 | 100 | 3 |
| 5 | PC | MVJ20MAE15 | AE | Aerospace Propulsion | 3 | - | - | 3 | 50 | 50 | 100 | 3 |
| 6 | PC | MVJ2MAEL16 | AE | Aerodynamic Lab | - | - | 3 | 3 | 50 | 50 | 100 | 2 |
| 7 | PC | MVJ20MAEL17 | AE | Propulsion Lab | - | - | 3 | 3 | 50 | 50 | 100 | 2 |
| 8 | IPR | MVJ20MAE18 | AE | Research Methodology & IPR | - | - | 2 | 3 | 50 | 50 | 100 | 2 |
| | | | | Total | 15 | 6 | 8 | 24 | 400 | 400 | 800 | 24 |

II SEMESTER M.TECH- (Aeronautical Engineering)

| S No | Course | | Course Title | Teaching Department | Teaching hours/week | | | | Examination | | | | Credits |
|--------------|--------|-------------|---|---------------------|---------------------|----------|-------------------|-------------------|-------------|-----------|-------------|-----|---------|
| | Type | Code | | | Theory | Tutorial | Practical/Drawing | Duration in Hours | CIE Marks | SEE Marks | Total marks | | |
| | | | | | | | | | | | | L | |
| 1 | PC | MVJ20MAE21 | Aircraft Performance & Flight Mechanics | AE | 3 | 1 | - | - | 3 | 50 | 50 | 100 | 4 |
| 2 | PC | MVJ20MAE22 | Airframe Structures and Structural Design | AE | 3 | 1 | - | - | 3 | 50 | 50 | 100 | 4 |
| 3 | PC | MVJ20MAE23 | Aircraft Flight Dynamics & Automatic Flight Control | AE | 3 | 1 | - | - | 3 | 50 | 50 | 100 | 4 |
| 4 | PC | MVJ20MAE24 | Flight Vehicle Design | AE | 3 | 1 | - | - | 3 | 50 | 50 | 100 | 4 |
| 5 | PE | MVJ20MAE25X | Professional Elective-I | AE | 3 | - | - | - | 3 | 50 | 50 | 100 | 3 |
| 6 | PE | MVJ20MAE26X | Professional Elective-II | AE | 3 | - | - | - | 3 | 50 | 50 | 100 | 3 |
| 7 | PC | MVJ20MAEL27 | Structures Lab | AE | - | - | - | 3 | 3 | 50 | 50 | 100 | 2 |
| 8 | Sem | MVJ20MAE28 | Technical Seminar | AE | - | - | - | 2 | - | 100 | - | 100 | 2 |
| Total | | | | | 18 | 4 | 5 | 21 | 450 | 350 | 800 | 26 | |

Note: PC: Professional Core Course, PE: Professional Elective Course

| Professional Elective-I | | Professional Elective-II | |
|-------------------------|--------------------------------------|--------------------------|--|
| Course Code | Course Title | Course Code | Course Title |
| MVJ20MAE25X | | MVJ20MAE26X | |
| MVJ20MAE251 | Artificial Intelligence and Robotics | MVJ20MAE261 | Fatigue and Fracture Mechanics |
| MVJ20MAE252 | Theory of Aeroelasticity | MVJ20MAE262 | Hypersonic Flows |
| MVJ20MAE253 | Theory of Plates and Shells | MVJ20MAE263 | Composite Materials and Fabrication Techniques |

Note:

1. **Technical Seminar:** CIE marks shall be awarded by a committee comprising of HoD as Chairman, Guide/co-guide in any and a senior faculty of the department. Participation in seminar by all postgraduate students of the same and other semesters of the programme shall be mandatory. The CIE marks awarded for Technical Seminar, shall be based on the evaluation of Seminar Report, Presentation skill and Question And Answer session in the ratio 50:25:25.

Probability & Statistics-Prerequisite for the MVJ20MAE252 Course

Properties of probability function, conditional probability, Law of total probability and Bayes' rule, discrete and continuous random variables, expectations and variance, covariance. Normalization techniques, Principle component analysis, Correlations, Multi Co linearity, Data Imputation techniques, Visualization techniques for different types of data (Box plot, histogram, contour plot etc). Computations with more random variables. Basic Statistical models, distribution features; linear regression models, Logistic Regression, Lasso Regression, Ridge Regression, Random Forest, XGboost, maximum likelihood principles, method of least square and its relation with maximum likelihood

III SEMESTER M.TECH- (Aeronautical Engineering)

| S No | Course | | Course Title | Teaching Department | Teaching hours/week | | | | Examination | | | | Credits |
|------|--------|-------------|-----------------------|---------------------|---------------------|----------|-------------------|-------------------|-------------|-----------|-------------|----|---------|
| | Type | Code | | | Theory | Tutorial | Practical/Drawing | Duration in Hours | CIE Marks | SEE Marks | Total marks | | |
| | | | | | | | | | | | | L | |
| 1 | PC | MVJ20MAE31 | Minor Project | AE | - | - | 3 | 3 | 50 | 50 | 100 | 4 | |
| 2 | PC | MVJ20MAE32 | Major Project Phase-1 | AE | - | - | 3 | 3 | 50 | 50 | 100 | 4 | |
| 3 | PC | MVJ20MAEI33 | Internship | AE | - | - | 2 | 3 | 50 | 50 | 100 | 10 | |
| | | | | Total | | | 8 | 9 | 150 | 150 | 300 | 18 | |

Note:

1. **Major Project Phase-1:** Students in consultation with the guide/co-guide if any, shall pursue literature survey and complete the preliminary requirements of selected Project work. Each student shall prepare relevant introductory project document, and present a seminar.

CIE marks shall be awarded by a committee comprising of HoD as Chairman, Guide and a senior faculty of the department. The CIE marks awarded for project work phase -1, shall be based on the evaluation of Project Report, Project Presentation skill and Question and Answer session in the ratio 50:25:25.

IV SEMESTER M.TECH- (Aeronautical Engineering)

| S No | Course | | Teaching Department | Teaching hours/week | | | Examination | | | | Credits |
|------|--------|-------------|-----------------------|---------------------|----------|-------------------|-------------------|-----------|-----------|-------------|---------|
| | Type | Code | | Theory | Tutorial | Practical/Drawing | Duration in Hours | CIE Marks | SEE Marks | Total marks | |
| 1 | PC | MVJ20MAEP41 | Major Project Phase-2 | - | - | 4 | 3 | 50 | 50 | 100 | 18 |
| | | | Total | | | 4 | 3 | 50 | 50 | 100 | 18 |

Note:

1. Major Project Phase-2:

CIE marks shall be awarded by a committee comprising of HoD as Chairman, Guide/co-guide, if any and a Senior faculty of the department. The CIE marks awarded for project work phase -2, shall be based on the evaluation of Project Report subjected to plagiarism check, Project Presentation skill and Question and Answer session in the ratio 50:25:25.

SEE shall be at the end of IV semester. Project work evaluation and Viva-Voce examination (SEE), after satisfying the plagiarism check.