

| VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI | | | | | | | | | | | | |
|---|-----------------------------|---|---|--------------------------------|----------|---|------------|-------------------|------------|------------|-------------|---------|
| B.E. in MECHANICAL ENGINEERING | | | | | | | | | | | | |
| Scheme of Teaching and Examinations 2021 | | | | | | | | | | | | |
| Outcome Based Education(OBE) and Choice Based Credit System (CBCS) | | | | | | | | | | | | |
| (Effective from the academic year 2021 - 22) | | | | | | | | | | | | |
| V SEMESTER | | | | | | | | | | | | |
| Sl. No | Course and Course Code | Course Title | Teaching Department (TD) and Question Paper Setting Board (PSB) | Teaching Hours /Week | | | | Examination | | | | Credits |
| | | | | Theory Lecture | Tutorial | / | Self-Study | Duration in hours | CIE Marks | SEE Marks | Total Marks | |
| | | | | L | T | P | S | | | | | |
| 1 | BSC 21ME51 | Theory of Machines | TD: ME PSB: ME | 2 | 2 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 2 | IPCC 21ME52 | Thermo-fluids Engineering | TD: ME PSB: ME | 3 | 0 | 2 | 0 | 03 | 50 | 50 | 100 | 4 |
| 3 | PCC 21ME53 | Finite Element Analysis | TD: ME PSB: ME | 2 | 0 | 2 | 0 | 03 | 50 | 50 | 100 | 3 |
| 4 | PCC 21ME54 | Modern Mobility and Automotive Mechanics | TD: ME PSB: ME | 3 | 0 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 5 | PCC 21MEL55 | Design lab | TD: ME PSB: ME | 0 | 0 | 2 | 0 | 03 | 50 | 50 | 100 | 1 |
| 6 | AEC 21XX56 | Research Methodology & Intellectual Property Rights | TD: Any Department PSB: As identified by University | 2 | 0 | 0 | 0 | 02 | 50 | 50 | 100 | 2 |
| 7 | HSMC 21CIV57 | Environmental Studies | TD: Civil/ Environmental /Chemistry/ Biotech. PSB: Civil Engg | 2 | 0 | 0 | 0 | 1 | 50 | 50 | 100 | 1 |
| 8 | AEC 21ME58X | Ability Enhancement Course-V | Concerned Board | If offered as Theory courses | | | | 01 | 50 | 50 | 100 | 1 |
| | | | | 0 | 2 | 0 | | | | | | |
| | | | | If offered as lab.Courses | | | | 02 | | | | |
| | | | | 0 | 0 | 2 | | | | | | |
| Total | | | | | | | | 400 | 400 | 800 | 18 | |
| Ability Enhancement Course – IV | | | | | | | | | | | | |
| 21ME581 | Basics of MATLAB(0-0-2-0) | | 21ME583 | VFX – Visual Effects (0-2-0-0) | | | | | | | | |
| 21ME582 | Digital Marketing (0-2-0-0) | | | | | | | | | | | |
| <p>Note: BSC: Basic Science Course, PCC: Professional Core Course, IPCC: Integrated Professional Core Course, AEC –Ability Enhancement Course INT –Internship, HSMC: Humanity and Social Science & Management Courses. L –Lecture, T – Tutorial, P- Practical/ Drawing, S – Self Study Component, CIE: Continuous Internal Evaluation, SEE: Semester End Examination.</p> | | | | | | | | | | | | |
| <p>Integrated Professional Core Course (IPCC): refers to Professional Theory Core Course Integrated with Practical of the same course. Credit for IPCC can be 04 and its Teaching – Learning hours (L : T : P) can be considered as (3 : 0 : 2) or (2 : 2 : 2). Theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by CIE only and there shall be no SEE. For more details the regulation governing the Degree of Bachelor of Engineering /Technology (BE/B.Tech.) 2021-22 may be referred.</p> | | | | | | | | | | | | |

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| Scheme of Teaching and Examinations 2021 | | | | | | | | | | | | |
| Outcome-Based Education(OBE) and Choice Based Credit System (CBCS) | | | | | | | | | | | | |
| (Effective from the academic year 2021 - 22) | | | | | | | | | | | | |
| VI SEMESTER | | | | | | | | | | | | |
| Sl. No | Course and Course Code | Course Title | Department (TD) and Question Paper Setting Board | Teaching Hours /Week | | | | Examination | | | | Credits |
| | | | | Theory Lecture | Tutorial | / | Self -Study | Duration in hours | CIE Marks | SEE Marks | Total Marks | |
| | | | | L | T | P | S | | | | | |
| 1 | HSMC 21ME61 | Production and Operations Management | TD: ME PSB: ME | 3 | 0 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 2 | IPCC 21ME62 | Heat Transfer | TD: ME PSB: ME | 3 | 0 | 2 | 0 | 03 | 50 | 50 | 100 | 4 |
| 3 | PCC 21ME63 | Machine design | TD: ME PSB: ME | 2 | 2 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 4 | PEC 21ME64x | Professional Elective Course-I | TD: ME PSB: ME | 3 | 0 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 5 | OEC 21ME65x | Open Elective Course-I | TD: ME PSB: ME | 3 | 0 | 0 | 0 | 03 | 50 | 50 | 100 | 3 |
| 6 | PCC 21MEL66 | CNC Programming and 3-D Printing Lab | TD: ME PSB: ME | 0 | 0 | 2 | 0 | 03 | 50 | 50 | 100 | 1 |
| 7 | MP 21MEM67 | Mini Project | | Two contact hours /week for interaction between the faculty and students. | | | | -- | 100 | -- | 100 | 2 |
| 8 | INT 21INT68 | Innovation/Entrepreneurship /Societal Internship | Completed during the intervening period of IV and V semesters. | | | | -- | 100 | -- | 100 | 3 | |
| Total | | | | | | | | | 500 | 300 | 800 | 22 |
| Professional Elective – I | | | | | | | | | | | | |
| 21ME641 | Supply Chain Management & Introduction to SAP | | 21ME643 | Autonomous vehicles | | | | | | | | |
| 21ME642 | Mechatronic System Design | | 21ME644 | Internet of Things (IoT) (2-0-2-0) | | | | | | | | |
| Open Electives – I offered by the Department to other Department students | | | | | | | | | | | | |
| 21ME651 | Project Management | | 21ME653 | Mechatronics | | | | | | | | |
| 21ME652 | Renewable Energy Power Plants | | 21ME654 | Modern Mobility | | | | | | | | |
| <p>Note: HSMC: Humanity and Social Science & Management Courses, IPCC: Integrated Professional Core Course, PCC: Professional Core Course, PEC: Professional Elective Courses, OEC–Open Elective Course, MP –Mini Project, INT – Internship.</p> <p>L –Lecture, T – Tutorial, P - Practical / Drawing, S – Self Study Component, CIE: Continuous Internal Evaluation, SEE: Semester End Examination.</p> | | | | | | | | | | | | |
| <p>Integrated Professional Core Course (IPCC): Refers to Professional Theory Core Course Integrated with Practical of the same course. Credit for IPCC can be 04 and its Teaching – Learning hours (L : T : P) can be considered as (3 : 0 : 2) or (2 : 2 : 2). The theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by CIE only and there shall be no SEE. For more details, the regulation governing the Degree of Bachelor of Engineering /Technology (BE/B.Tech) 2021-22 may be referred.</p> | | | | | | | | | | | | |
| <p>Professional Elective Courses(PEC): A professional elective (PEC) course is intended to enhance the depth and breadth of educational experience in the</p> | | | | | | | | | | | | |

Engineering and Technology curriculum. Multidisciplinary courses that are added supplement the latest trend and advanced technology in the selected stream of engineering. Each group will provide an option to select one course out of five course. The minimum students' strength for offering professional electives is 10. However, this conditional shall not be applicable to cases where the admission to the programme is less than 10.

Open Elective Courses:

Students belonging to a particular stream of Engineering and Technology are not entitled for the open electives offered by their parent Department. However, they can opt an elective offered by other Departments, provided they satisfy the prerequisite condition if any. Registration to open electives shall be documented under the guidance of the Program Coordinator/ Advisor/Mentor.

Selection of an open elective shall **not be allowed** if,

- (i) The candidate has studied the same course during the previous semesters of the program.
- (ii) The syllabus content of open electives is similar to that of the Departmental core courses or professional electives.
- (iii) A similar course, under any category, is prescribed in the higher semesters of the program.

In case, any college is desirous of offering a course (not included in the Open Elective List of the University) from streams such as Law, Business (MBA), Medicine, Arts, Commerce, etc., can seek permission, at least one month before the commencement of the semester, from the University by submitting a copy of the syllabus along with the details of expertise available to teach the same in the college.

The minimum students' strength for offering open electives is 10. However, this conditional shall not be applicable to cases where the admission to the programme is less than 10.

Mini-project work: Mini Project is a laboratory-oriented course which will provide a platform to students to enhance their practical knowledge and skills by the development of small systems/applications.

Based on the ability/abilities of the student/s and recommendations of the mentor, a single discipline or a multidisciplinary Mini- project can be assigned to an individual student or to a group having not more than 4 students.

CIE procedure for Mini-project:

(i) **Single discipline:** The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two faculty members of the Department, one of them being the Guide. The CIE marks awarded for the Mini-project work shall be based on the evaluation of project report, project presentation skill, and question and answer session in the ratio of 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

(ii) **Interdisciplinary:** Continuous Internal Evaluation shall be group-wise at the college level with the participation of all the guides of the project.

The CIE marks awarded for the Mini-project, shall be based on the evaluation of project report, project presentation skill, and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

No SEE component for Mini-Project.

VII semester Classwork and Research Internship /Industry Internship (21INT82)

Swapping Facility

Institutions can swap VII and VIII Semester Scheme of Teaching and Examinations to accommodate research internship/ industry internship after the VI semester.

(2) Credits earned for the courses of VII and VIII Semester Scheme of Teaching and Examinations shall be counted against the corresponding semesters whether VII or VIII semester is completed during the beginning of IV year or later part of IV year of the program.

Elucidation:

At the beginning of IV year of the programme i.e., after VI semester, VII semester classwork and VIII semester Research Internship /Industrial Internship shall be permitted to be operated simultaneously by the University so that students have ample opportunity for internship. In other words, a good percentage of the class shall attend VII semester classwork and similar percentage of others shall attend to Research Internship or Industrial Internship.

Research/Industrial Internship shall be carried out at an Industry, NGO, MSME, Innovation centre, Incubation centre, Start-up, Centers of Excellence (CoE), Study Centre established in the parent institute and /or at reputed research organizations / institutes. The intership can also be rural intership.

The mandatory Research internship /Industry internship is for 24 weeks. The internship shall be considered as a head of passing and shall be considered for the award of degree. Those, who do not take up/complete the internship shall be declared fail and shall have to complete during the subsequent University examination after satisfying the internship

requirements.

INT21INT82 Research Internship/ Industry Internship/Rural Internship

Research internship: A research internship is intended to offer the flavour of current research going on in the research field. It helps students get familiarized with the field and imparts the skill required for carrying out research.

Industry internship: Is an extended period of work experience undertaken by students to supplement their degree for professional development. It also helps them learn to overcome unexpected obstacles and successfully navigate organizations, perspectives, and cultures. Dealing with contingencies helps students recognize, appreciate, and adapt to organizational realities by tempering their knowledge with practical constraints.

Rural internship: A long-term goal, as proposed under the AICTE rural internship programme, shall be counted as rural internship activity.

The student can take up Interdisciplinary Research Internship or Industry Internship.

The faculty coordinator or mentor has to monitor the students' internship progress and interact with them to guide for the successful completion of the internship.

The students are permitted to carry out the internship anywhere in India or abroad. University shall not bear any expenses incurred in respect of internship.