

# MVJ College of Engineering, Bengaluru (An Autonomous Institute)

Affiliated to VTU, Belagavi, Approved by AICTE, New Delhi, Recognised by UGC with 2(f) & 12 (B), Accredited by NBA & NAAC

## Scheme of Teaching and Examination 2022-23

Outcome Based Education (OBE) and Choice Based Credit System (CBCS) Effective from the academic year 2022-23

## III SEMESTER

				<u></u>		hing	Hours/V	Veek		Exan	nination		
Sl. No.		Course	Course Title	Teaching Department	Theory/ lecture	Tutorials	Practical/ Drawing	Self-Study Components	Duration in Hours	CIE Marks	SEE Marks	Total Marks	Credits
	Туре	Code			լ	Т	Р	S	Dur			,	
1	BSC	MVJ22MME31	Mathematics for Mechanical Engineers	MA	2	2	0	-	03	50	50	100	3
2	PCC	MVJ22ME32	Engineering Thermodynamics	ME	3	0	0	-	03	50	50	100	3
3	IPCC	MVJ22ME33	Material Science and Engineering	ME	3	0	2	Υ	03	50	50	100	4
4	PCC	MVJ22ME34	Mechanics of Materials	ME	3	0	0	-	03	50	50	100	3
5	PCCL	MVJ22MEL35	Computer Aided Machine Drawing	ME	0	0	2	-	03	50	50	100	1
6	ESC	MVJ22ME36x	ESC/ETC/PLC	ME	3	0	0	-	03	50	50	100	3
7	SCR	MVJ22SCR37	Mathematics for Mechanical Engineers	ME	0	0	2	-	01	100	-	100	1
8	AEC/SEC	MVJ22A3YY1	AEC Vertical Level 1	Respective Vertical	1	0	2	-	02	50	50	100	2
		MVJ22NS39	National Service Scheme (NSS).	NSS coordinator									
9	МС	MVJ22PE39	Physical Education (PE) (Sports and Athletics).	PE Director	0	0	2	-	-	100	-	100	0
		MVJ22YO39	Yoga.	Yoga Teacher									
10	BSC	MVJ22MATDIP-I	Additional Mathematics-I	MA	1	2	0	-	3	100	-	100	0
				Total	15/16	2/4	10/12	-	21/24	550/65 0	350/350	900/1000	20

Note: BSC: Basic Science Course, IPCC: Integrated Professional Core Course, PCC: Professional Core Course, PCCL: Professional Core Course laboratory, ESC: Engineering Science Course, ETC: Emerging Technology Course, PLC: Programming Language Course, SCR: Social Connect Responsibility, AEC: Ability Enhancement Course, SEC: Skill Enhancement Course, MC: Mandatory Course (Non-credit), L: Lecture, T: Tutorial, P: Practical, S: Self Study, SDA: Skill Development Activity, CIE: Continuous Internal Evaluation, SEE: Semester End Evaluation.

	Engineering Science C	Course (ESC/ETC/P	PLC)
MVJ22ME361	Electric and Hybrid Vehicle Technology	MVJ22ME362	Internet of Things (IoT) for Smart Factories
MVJ22ME363	Smart Materials & Systems	MVJ22ME364	Instrumentation and Controls
	Ability Enhancement Course – III – MVJ22AXYYL (X is S	Semester, YY is vert	ical Number, L is level of the vertical)
MVJ22A3011	Idea Box - Innovation	MVJ22A3071	IoT – Connecting the world
MVJ22A3021	Tomorrow's Engineers – Engineering Solution to Societal Problems	MVJ22A3081	FSIPD –Ideas to Product
MVJ22A3031	Tinkering Lab – Experiment and Conceptualize	MVJ22A3091	Software Development - Code your ideas
MVJ22A3041	UAV – Develop Drones	MVJ22A3101	LabVIEW – Graphical Programming
MVJ22A3051	Astronomy – Explore the space	MVJ22A3111	CNC Programming – Advanced Manufacturing
MVJ22A3061	Robotics and Industrial Automation Lab – Design Robots	MVJ22A3121	NCC

Professional Core Course (IPCC): Refers to Professional Core Course Theory 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 only CIE (no SEE). However, questions from the practical part of IPCC shall be included in the SEE question paper. For more details, the regulation governing the Degree of Bachelor of Engineering /Technology (B.E./ B. Tech.) 2022-23 may please be referred.

National Service Scheme /Physical Education/Yoga: All students have to register for any one of the courses namely National Service Scheme (NSS), Physical Education (PE)(Sports and Athletics), and Yoga(YOG) with the concerned coordinator of the course during the first Week of III semesters. Activities shall be carried out between III semester to the VI semester (for 4 semesters). Successful completion of the registered course and requisite CIE score is mandatory for the award of the Degree. The events shall be appropriately scheduled by the colleges and the same shall be reflected in the calendar prepared for the NSS, PE, and Yoga activities. These courses shall not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the course is mandatory for the award of Degree.

#### **IV SEMESTER**

					Tea	aching H	ours/Wee	ek		Exan	nination		
Sl. No.		Course	Course Title	Teaching Department	Theory lecture	Tutorials	Practical/ Drawing	Self-Study Components	Duration in Hours	CIE Marks	SEE Marks	Total Marks	Credits
	Туре	Code			L	Т	Р	S	Dur			·	
1	PCC	MVJ22ME41	Manufacturing Process	ME	3	0	0	-	03	50	50	100	3
2	IPCC	MVJ22ME42	Machining Science & Operations	ME	3	0	2	-	03	50	50	100	4
3	IPCC	MVJ22ME43	Fluid Mechanics	ME	3	0	2	Υ	03	50	50	100	4
4	PCCL	MVJ22MEL44	Mechanical Measurements and Metrology lab	ME	0	0	2	-	03	50	50	100	1
5	ESC	MVJ22ME45X	ESC/ETC/PLC	ME	3	0	0	-	03	50	50	100	3
6	AEC/SEC	MVJ22A4YY2	AEC Vertical Level 2	Respective Verticals	1	0	2	-	02	50	50	100	2
7	BSC	MVJ22BI47	Biology For Engineers	BT, CHE	2	0	0	-	02	50	50	100	2
8	UHV	MVJ22UHV48	Universal human values course	Any Department	1	0	0	-	02	50	50	100	1
		MVJ22NS49	National Service Scheme (NSS).	NSS coordinator									
9	МС	MVJ22PE49	Physical Education (PE) (Sports and Athletics).	PE Director	0	0	2	-	-	100	-	100	0
		MVJ22YO49	Yoga.	Yoga Teacher									
10	BSC	MVJ22MATDIP-II	Additional Mathematics-II	MA	1	2	0	-	3	100	-	100	0
				Total	16/17	0/2	8/10	-	21/24	450/550	450/450	900/1000	20

Note: PCC: Professional Core Course, IPCC: Integrated Professional Core Course, PCCL: Professional Core Course laboratory, ESC: Engineering Science Course, ETC: Emerging Technology Course, PLC: Programming Language Course, AEC: Ability Enhancement Course, SEC: Skill Enhancement Course, BSC: Basic Science Course, UHV: Universal Human Value Course, MC: Mandatory Course (Non-credit), L: Lecture, T: Tutorial, P: Practical, S: Self Study, SDA: Skill Development Activity, CIE: Continuous Internal Evaluation, SEE: Semester End Evaluation.

Engineering Science Course (ESC/ETC/PLC)								
MVJ22ME451 Python for Mechanical Engineers MVJ22ME453 Micro Electro Mechanical Systems								
MVJ22ME452 Precision Engineering and Nano Fabrication MVJ22ME454 Robotics and Automation								

Abili	Ability Enhancement Course / Skill Enhancement Course – IV - MVJ22AXYYL (X is Semester, YY is vertical Number, L is level of the vertical)									
MVJ22A4012	Idea Box - Innovation	MVJ22A4072	IoT – Connecting the world							
MVJ22A4022	Tomorrow's Engineers – Engineering Solution to Societal Problems	MVJ22A4082	FSIPD –Ideas to Product							
MVJ22A4032	Tinkering Lab – Experiment and Conceptualize	MVJ22A4092	Software Development - Code your ideas							
MVJ22A4042	UAV – Develop Drones	MVJ22A4102	LabVIEW – Graphical Programming							
MVJ22A4052	Astronomy – Explore the space	MVJ22A4112	CNC Programming – Advanced Manufacturing							
MVJ22A4062	Robotics and Industrial Automation Lab – Design Robots	MVJ22A4122	NCC							

Professional Core Course (IPCC): Refers to Professional Core Course Theory 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 only CIE (no SEE). However, questions from the practical part of IPCC shall be included in the SEE question paper. For more details, the regulation governing the Degree of Bachelor of Engineering /Technology (B.E./B.Tech.) 2022-23

National Service Scheme /Physical Education/Yoga: All students have to register for any one of the courses namely National Service Scheme (NSS), Physical Education (PE)(Sports and Athletics), and Yoga(YOG) with the concerned coordinator of the course during the first Week of III semesters. Activities shall be carried out between III semester to the VI semester (for 4 semesters). Successful completion of the registered course and requisite CIE score is mandatory for the award of the Degree. The events shall be appropriately scheduled by the colleges and the same shall be reflected in the calendar prepared for the NSS, PE, and Yoga activities. These courses shall not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the courses is mandatory for the award of Degree.

#### **V SEMESTER**

					Tead	ching	Hours/V	Veek		Exami	nation		
Sl. No.		Course	Course Title	Teaching Department	Theory lecture	Tutorials	Practical/ Drawing	Self-Study Components	Duration in Hours	CIE Marks	SEE Marks	Total Marks	Credits
	Type	Code			L	Т	Р	S					
1	HSMC	MVJ22ME51	Technical Management & Entrepreneurship	ME	3	0	0	-	03	50	50	100	3
2	IPCC	MVJ22ME52	Turbo Machines	ME	3	0	2	Υ	03	50	50	100	4
3	PCC	MVJ22ME53	Theory of Machines	ME	3	2	0	-	03	50	50	100	4
4	PCCL	MVJ22MEL54	CNC Programming and 3-D Printing lab	ME	0	0	2	-	03	50	50	100	1
5	PEC	MVJ22ME55x	Professional Elective Course - I	ME	3	0	0	-	03	50	50	100	3
6	PROJ	MVJ22MEP56	Mini Project	ME	0	0	4	-	03	100	-	100	2
7	AEC	MVJ22RMI57	Essence of Research Methodology and IPR	ME	3	0	0		03	50	50	100	3
8	МС	MVJ22ENV58	Environmental Studies	CV	2	0	0		02	50	50	100	2
		MVJ22NS59	National Service Scheme (NSS).	NSS coordinator									
9	MC	MVJ22PE59	Physical Education (PE) (Sports and Athletics).	PE Director	0	0	2	-	_	100	-	100	0
		MVJ22YO59	Yoga.	Yoga Teacher									
				Total	17	2	10	-	23	55 0	35 0	900	22

Note: HSMC: Humanities, Social Science and Management Course, IPCC: Integrated Professional Core Course, PCC: Professional Core Course, PCCL: PCCL:

	Professional Elective Course - I									
MVJ22ME551	Mechatronics and Microprocessors	MVJ22ME553	Supply chain management & Introduction to SAP							
MVJ22ME552	Automation in manufacturing	MVJ22ME554	Process Equipment Design							

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National Service Scheme /Physical Education/Yoga: All students have to register for any one of the courses namely National Service Scheme (NSS), Physical Education (PE)(Sports and Athletics), and Yoga(YOG) with the concerned coordinator of the course during the first Week of III semesters. Activities shall be carried out between III semester to the VI semester (for 4 semesters). Successful completion of the registered course and requisite CIE score is mandatory for the award of the Degree. The events shall be appropriately scheduled by the colleges and the same shall be reflected in the calendar prepared for the NSS, PE, and Yoga activities. These courses shall not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the course is mandatory for the award of Degree.

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

Professional Elective Courses (PEC): A professional elective (PEC) course is intended to enhance the depth and breadth of educational experience in the 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. The minimum number of students' strengths for offering a professional elective is 10. However, this conditional shall not be applicable to cases where the admission to the program is less than 10.

#### VI SEMESTER

					Tea	ching '	Hours/W	/eek	•	Examir	nation		
Sl. No.	C	Course	Course Title	Teaching Department	Theory	Tutorials	Practical/ Drawing	Self-Study Components	Duration in Hours	CIE Marks	SEE Marks	Total Marks	Credits
	Туре	Code			L	Т	Р	S					
1	IPCC	MVJ22ME61	Heat Transfer	ME	3	0	2	Υ	03	50	50	100	4
2	PCC	MVJ22ME62	Machine Design	ME	3	0	0	-	03	50	50	100	3
3	PEC	MVJ22ME63x	Professional Elective Course - II	ME	3	0	0	-	03	50	50	100	3
4	OEC	MVJ22ME64x	Open Elective Course - I	ME	3	0	0	-	03	50	50	100	3
5	PROJ	MVJ22MEP65	Project Phase I	ME	0	0	4	-	03	100	-	100	2
6	PCCL	MVJ22MEL66	Design Laboratory	ME	0	0	2	-	03	50	50	100	1
7	AEC/SDC	MVJ22A6YY3	AEC Vertical Level 3	Respective Vertical	1	0	2	-	02	50	50	100	1
8	HSMC	MVJ22IKK68	Indian Knowledge System	ME	1	0	0	-	02	50	50	100	1
		MVJ22NS69	National Service Scheme (NSS).	NSS coordinator									
9	MC	MVJ22PE69	Physical Education (PE) (Sports and Athletics).	Physical Education Director	0	0	2	_	-	100	-	100	0
		MVJ22YO69	Yoga.	Yoga Teacher									
				Total	14	0	12	_	22	550	350	900	18

Note: IPCC: Integrated Professional Core Course, PCC: Professional Core Course, PEC: Professional Elective Course, OEC: Open Elective Course, PROJ: Project /Mini Project, PCCL: Professional Core Course laboratory, AEC: Ability Enhancement Course, MC: Mandatory Course (Non-credit), L: Lecture, T: Tutorial, P: Practical S: Self Study, CIE: Continuous Internal Evaluation, SEE: Semester End Evaluation.

	Professional Elective Course - II									
MVJ22ME631	J22ME631   Total Quality Management   MVJ22ME633   Hydraulics an									
MVJ22ME632	Refrigeration and Air Conditioning	Design for Manufacturing and Assembly								
	Open Elective Course	- I								
MVJ22ME641	Operations and Project Management	MVJ22ME643	Additive Manufacturing							
MVJ22ME642	Sustainable Energy Systems	MVJ22ME644	Modern Mobility							

Ab	Ability Enhancement Course / Skill Enhancement Course-V - MVJ22AXYYL (X is Semester, YY is vertical Number, L is level of the vertical)									
MVJ22A6013	Idea Box - Innovation	MVJ22A6073	IoT – Connecting the world							
MVJ22A6023	Tomorrow's Engineers – Engineering Solution to Societal Problems	MVJ22A6083	FSIPD –Ideas to Product							
MVJ22A6033	Tinkering Lab – Experiment and Conceptualize	MVJ22A6093	Software Development - Code your ideas							
MVJ22A6043	UAV – Develop Drones	MVJ22A6103	LabVIEW – Graphical Programming							
MVJ22A6053	Astronomy – Explore the space	MVJ22A6113	CNC Programming – Advanced Manufacturing							
MVJ22A6063	Robotics and Industrial Automation Lab – Design Robots	MVJ22A6123	NCC							

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Professional Elective Courses (PEC): A professional elective (PEC) course is intended to enhance the depth and breadth of educational experience in the 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. The minimum number of students' strengths for offering professional electives is 10. However, this conditional shall not be applicable to cases where the admission to the program is less than 10.

#### **Open Elective Courses:**

Students belonging to a particular stream of Engineering and Technology are not entitled to the open electives offered by their parent Department. However, they can opt for 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. The minimum numbers of students' strength for offering Open Elective Course is 10. However, this condition shall not be applicable to class where the admission to the program is less than 10.

**Project Phase-I**: Students have to discuss with the mentor /guide and with their help he/she has to complete the literature survey and prepare the report and finally define the problem statement for the project work.

#### VII SEMESTER

					Tead	ching H	fours/W	/eek		Exar	nination		
Sl. No.		Course	Course Title	Teaching Department	Theory lecture	Tutorials	Practical/ Drawing	Self-Study Components	Duration in Hours	CIE Marks	SEE Marks	Total Marks	Credits
	Туре	Code			L	Т	Р	S	Dur			,	
1	IPCC	MVJ22ME71	Finite Element Methods	ME	3	0	2	-	03	50	50	100	4
2	IPCC	MVJ22ME72	Mechanical Vibrations	ME	3	0	2	Υ	03	50	50	100	4
3	PCC	MVJ22ME73	Operations Research	ME	4	0	0	-	03	50	50	100	4
4	PEC	MVJ22ME74x	Professional Elective Course - III	ME	3	0	0	-	03	50	50	100	3
5	OEC	MVJ22ME75x	Open Elective Course - II	ME	3	0	0	-	03	50	50	100	3
6	PROJ	MVJ22MEP76	Major Project Phase-II	ME	0	0	12	-	03	100	100	200	6
	·			Total	16	0	16	-	18	350	350	700	24

Note: IPCC: Integrated Professional Core Course, PCC: Professional Core Course, PEC: Professional Elective Course, OEC: Open Elective Course, PROJ: Project / Mini Project, L: Lecture, T: Tutorial, P: Practical S: Self Study, CIE: Continuous Internal Evaluation, SEE: Semester End Evaluation.

Professional Elective Course - III								
Additive manufacturing	MVJ22ME743	Tribology and Surface Engineering						
AI & ML for Mechanical Engineers	MVJ22ME744	Cryogenics						
	Open Electiv	ve Course - II						
Digital Manufacturing	MVJ22ME753	Operations Research						
Product Design and Development	MVJ22ME754	Statistical Design and DoE						

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## **Open Elective Courses:**

Students belonging to a particular stream of Engineering and Technology are not entitled to the open electives offered by their parent Department. However, they can opt for 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. The minimum numbers of students' strength for offering Open Elective Course is 10. However, this condition shall not be applicable to class where the admission to the program is less than 10.

#### PROJECT WORK (MVJ22CVP76): The objective of the Project work is

- (i) To encourage independent learning and the innovative attitude of the students.
- (ii) To develop interactive attitude, communication skills, organization, time management, and presentation skills.
- (iii) To impart flexibility and adaptability.
- (iv) To inspire team working.
- (v) To expand intellectual capacity, credibility, judgment and intuition.
- (vi) To adhere to punctuality, setting and meeting deadlines.
- (vii) To install responsibilities to oneself and others.
- (viii) To train students to present the topic of project work in a seminar without any fear, face the audience confidently, enhance communication skills, involve in group discussion to present and exchange ideas.

## CIE procedure for Project Work:

(1) Single discipline: The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide.

The CIE marks awarded for the project work, shall be based on the evaluation of the project work 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.

(2) Interdisciplinary: Continuous Internal Evaluation shall be group-wise at the college level with the participation of all guides of the college. Participation of external guide/s, if any, is desirable. The CIE marks awarded for the project work, shall be based on the evaluation of project work 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.

SEE procedure for Project Work: SEE for project work will be conducted by the two examiners appointed by the University. The SEE marks awarded for the project work shall be based on the evaluation of project work Report, project presentation skill, and guestion and answer session in the ratio 50:25:25.

#### VIII SEMESTER

		Course Title	Teaching Department	Teaching Hours/Week				Examination				
	Course			Theory lecture	Tutorials	Practical/ Drawing	Self-Study Components	Duration in Hours CIE Marks	SEE Marks	Total Marks	Credits	
Туре	Code			L	Т	Р	S					
PEC	MVJ22ME81x	Professional Elective Course - IV (Online Courses)	ME	-	-	-	-	-	-	_	-	3
OEC	MVJ22ME82x	Open Elective Course - III (Online Courses)	ME	-	-	_	-	-	-	-	-	3
INT	MVJ22MEI83	Internship (Industry/Research) (14 - 20 weeks)		0	0	12	-	03	100	100	200	10
			Total	0	0	Professional Elective (Online Courses)	-	03	100	100	200	16
	PEC OEC	Type Code PEC MVJ22ME81x OEC MVJ22ME82x	Type Code  PEC MVJ22ME81x Professional Elective Course - IV (Online Courses)  OEC MVJ22ME82x Open Elective Course - III (Online Courses)  INT MVJ22ME83 Internship (Industry/Research) (14 - 20	Type Code  PEC MVJ22ME81x Professional Elective Course - IV (Online Courses)  OEC MVJ22ME82x Open Elective Course - III (Online Courses)  INT MVJ22ME83 Internship (Industry/Research) (14 - 20 weeks)	Course  Course Title  Teaching Department  Teaching Department  L  PC MVJ22ME81x Professional Elective Course - IV (Online Courses)  OEC MVJ22ME82x Open Elective Course - III (Online Courses)  INT MVJ22ME183 Internship (Industry/Research) (14 - 20 weeks)  Total	Course Title  Course Title  Teaching Department  Teaching Department  L T  PEC MVJ22ME81x Professional Elective Course - IV (Online Courses)  OEC MVJ22ME82x Open Elective Course - III (Online Courses)  INT MVJ22ME183 Internship (Industry/Research) (14 - 20 weeks)  Total	Course  Course Title  Teaching Department  Teaching Department  L T P  PEC MVJ22ME81x Professional Elective Course - IV (Online Courses)  OEC MVJ22ME82x Open Elective Course - III (Online Courses)  INT MVJ22MEI83 Internship (Industry/Research) (14 - 20 weeks)  Total  Total  Professional Elective (Online Course)  Professional Elective (Online Course)  Total	Course Title  Teaching Department  Teaching Department  Total  Teaching Department  Teaching Department  Teaching Department  Total  Total  Total  Total  Teaching Department  Teaching Department  Teaching Department  Total  Total  Total  Total  Teaching Department  Total  Total	Course  Course Title  Teaching Department  Teaching Department  L T P S D  Total  Total  Teaching Department  Teaching Department  Teaching Department  Total  Total  Total  Total  Total  Teaching Department  Total  Total  Total  Total  Total  Total  Total  Total  Teaching Department  Total  Total	Course   Course Title   Teaching   Department   Teaching   L T P S D D   Total   Tot	Course   Course Title   Teaching Department   Teaching Department   Teaching Department   Teaching Department   Teaching Department   Teaching Department   Total   Teaching Department   Total Departme	Teaching   Department   Teac

Professional Elective Course – IV (Online Courses) (Some of the Online courses of NPTEL are mentioned here, but student can chose online courses related to his branch of study from NPTEL and complete the course under the guidance of his mentor/proctor and pass the certificate exam and shall furnish the certificate for awarding the credit) MVJ22ME811 Quality Design & Control (Available in NPTEL) MVJ22ME813 Modelling & Analytics for Supply Chain Management (Available in NPTEL) MVJ22ME812 Machinery Fault Diagnosis and Signal MVJ22ME814 Strategies for Sustainable Design Processing (Available in NPTEL) (Available in NPTEL) Open Elective Course - III (Online Courses) MVJ22ME821 MVJ22ME823 Computer Integrated Manufacturing Fundamentals of Automotive systems (Available in NPTEL) (Available in NPTEL) Product Design and Manufacturing (Available MVJ22ME824 Business Planning & Project Management MVJ22ME822 in NPTEL) (Available in Swayam Portal)

#### Elucidation:

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

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

The mandatory Research internship /Industry internship / Rural Internship is for 14 to 20 Weeks. The internship shall be considered as a head of passing and shall be considered for the award of a Degree. Those, who do not take up/complete the internship shall be declared to fail and shall have to complete it during the subsequent University examination after satisfying the internship requirements.

Research internship: A research internship is intended to offer the flavor 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: Rural development internship is an initiative of Unnat Bharat Abhiyan Cell, RGIT in association with AICTE to involve students of all departments studying in different academic years for exploring various opportunities in techno-social fields, to connect and work with Rural India for their upliftment.

The faculty coordinator or mentor has to monitor the student's 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 the internship.

With the consent of the internal guide and Principal of the Institution, students shall be allowed to carry out the internship at their hometown (within or outside the state or abroad), provided favorable facilities are available for the internship and the student remains regularly in contact with the internal guide. University shall not bear any cost involved in carrying out the internship by students. However, students can receive any financial assistance extended by the organization.

Professional Elective /Open Elective Course: These are ONLINE courses suggested by the respective Board of Studies. Details of these courses shall be made available for students by the respective board of studies well before starting of semester.

HOD Dean Academics