SCHEME AND SYLLABUS -2018

VISVESVARAYATECHNOLOGICALUNIVERSITY,BELAGAVI
SchemeofTeachingandExamination2018–19
OutcomeBasedEducation(OBE)andChoiceBasedCreditSystem(CBCS)(Effectivefromtheacademicyear2018–19)

IIISEMESTER

Sl. No	Course andCourseCode		Course Title	Teaching Department	Teaching Hours /Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration inhours	CIEMarks	SEEMarks	TotalMarks	
					L	T	P					
1	BSC	18MAT31	Transform calculus, fourier series and Numerical techniques	Mathematics	2	2	--	03	40	60	100	3
2	PCC	18ME32	Mechanics of Materials		3	2	--	03	40	60	100	4
3	PCC	18ME33	Basic Thermodynamics		3	0	--	03	40	60	100	3
4	PCC	18ME34	Material Science		3	0	--	03	40	60	100	3
5	PCC	18ME35Aor	Metal cutting and forming		3	0	--	03	40	60	100	3
		18ME35B	Metal Casting and Welding									
6	PCC	18ME36Aor	Computer Aided Machine Drawing/		1	4	--	03	40	60	100	3
		18ME36B	Mechanical Measurements and Metrology		3	0						
7	PCC	18MEL37A or	Material Testing lab		--	2	2	03	40	60	100	2
		18MEL37B	Mechanical Measurements and Metrology lab									
8	PCC	18MEL38A	Workshop and Machine Shop Practice(Consists of Fitting, and Machining)		--	2	2	03	40	60	100	2
		18MEL38B	Foundry, Forging and Welding lab									
9	HSMC	18KVK39/49	Vyavaharika Kannada (Kannada for communication)/	HSMC	--	2	--	--	100	--	100	1
		18KAK39/49	Aadalitha Kannada (Kannada for Administration)									
			OR									
		18CPC39	Constitution of India, Professional Ethics and Cyber Law		1	--	--	02	40	60		
					Examination is by objective type questions							
				TOTAL	**17 OR 19**	**10 OR 14**	**04**	**24 OR 26**	**420 OR 360**	**480 OR 540**	**900**	**24**

SAMBHRAM INSTITUTE OF TECHNOLOGY

M S Palya, Bangalore-560097

Department of Mechanical Engineering

VISVESVARAYATECHNOLOGICALUNIVERSITY,BELAGAVI
SchemeofTeachingandExamination2018–19
OutcomeBasedEducation(OBE)andChoiceBasedCreditSystem(CBCS)(Effectivefromtheacademicyear2018–19)

IVSEMESTER

Sl. No	Course andCourseCode		Course Title	Teaching Department	TeachingHours /Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration inhours	CIE Marks	SEEMarks	TotalMarks	
					L	T	P					
1	BSC	18MAT41	Mathematics	Mathematics	2	2	--	03	40	60	100	3
2	PCC	18ME42	Applied Thermodynamics		3	2	--	03	40	60	100	4
3	PCC	18ME43	Fluid Mechanics		3	0	--	03	40	60	100	3
4	PCC	18ME44	Kinematics of Machines		3	0	--	03	40	60	100	3
5	PCC	18ME45A	Metal cutting and forming		3	0	--	03	40	60	100	3
		18ME45B	Metal Casting and Welding									
6	PCC	18ME46Aor	Computer Aided Machine Drawing/		1	4	--	03	40	60	100	3
		18ME46B	Mechanical Measurements and Metrology		3	0						
7	PCC	18MEL47A or	Material Testing lab		--	2	2	03	40	60	100	2
		18MEL47B	Mechanical Measurements and Metrology lab									
8	PCC	18MEL48A	Workshop and Machine Shop Practice(Consists of Fitting, and Machining)		--	2	2	03	40	60	100	2
		18MEL48B	Foundry, Forging and Welding lab									
9	HSMC	18KVK49/49	Vyavaharika Kannada (Kannada for communication)/	HSMC	--	2	--	--	100	--	100	1
		18KAK49/49	Aadalitha Kannada (Kannada for Administration)									
		OR										
		18CPH49	Constitution of India, Professional Ethics and Cyber Law		1	--	--	02	40	60		
					Examination is by objective type questions							
				TOTAL	**17 OR 19**	**10 OR 14**	**04**	**24 OR 26**	**420 OR 360**	**480 OR 540**	**900**	**24**

18KVK39VyavaharikaKannada(Kannadaforcommunication)isfornon-Kannadaspeaking,readingandwritingstudentsand18KAK39 AadalithaKannada(KannadaforAdministration)isforstudentswhospeak,readandwriteKannada.

CourseprescribedtolateralentryDiplomaholdersadmittedtoIIIsemesterofEngineeringprograms

10	NCMC	18MATDIP31	Additional Mathematics-I	Mathematics	02	01	--	03	40	60	100	0

(a) Themandatorynon–creditcoursesAdditionalMathematicsIandIIprescribedfor III and IV semesters respectively, to the lateral entry Diploma holders admitted to III semester of BE/B. Tech programs, shall attend the classes during the respective semesters to complete all the formalities of the course and appear for the University examination. In case, any student fails to register for the said course/ fails to secure the minimum 40 % of the prescribed CIE marks, he/she shall be deemed to have secured F grade. In such a case, the student have to fulfill the requirements during subsequent semester/stop appear for SEE.

(b) TheseCoursesshallnotbeconsideredforverticalprogression,butcompletionofthecoursesshallbemandatoryfortheawardofdegree.

CoursesprescribedtolateralentryB.ScdegreeholdersadmittedtoIIIsemesterofEngineeringprograms

Lateral entrant students from B.Sc. Stream, shall clear the non-credit courses Engineering Graphics and Elements of Civil Engineering andMechanicsoftheFirstYearEngineeringProgramme.TheseCoursesshallnotbeconsideredforverticalprogression,butcompletionofthecourses Shall be mandatory for the award of degree.

VISVESVARAYATECHNOLOGICALUNIVERSITY,BELAGAVI
Scheme of Teaching and Examination 2018 – 19OutcomeBasedEducation(OBE)and Choice Based Credit System(CBCS)
(Effectivefromtheacademicyear2018–19)

VSEMESTER

Sl. No	Course andCoursecode		CourseTitle	Teaching Department	Teaching Hours /Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration inhours	CIEMarks	SEEMarks	TotalMarks	
					L	T	P					
1	PCC	18ME51	Management and Economics		2	2	--	03	40	60	100	3
2	PCC	18ME52	Design of Machine Elements I		3	2	--	03	40	60	100	4
3	PCC	18ME53	Dynamics of Machines		3	2	--	03	40	60	100	4
4	PCC	18ME54	Turbo Machines		3	--	--	03	40	60	100	3
5	PCC	18ME55	Fluid Power Engineering		3	--	--	03	40	60	100	3
6	PCC	18ME56	Operations Management		3	--	--	03	40	60	100	3
7	PCC	18MEL57	Fluid Mechanics/Machines lab		--	2	2	03	40	60	100	2
8	PCC	18MEL58	Energy Conversion Lab		--	2	2	03	40	60	100	2
9	HSMC	18CIV59	Environmental Studies	Civil/Environmental [Paper setting: Civil Engineering Board]	1	--	--	02	40	60	100	1
				TOTAL	**18**	**10**	**04**	**26**	**360**	**540**	**900**	**25**

Note: PCC: Professional Core, HSMC: Humanity and Social Science.

AICTEactivityPoints: IncasestudentsfailtoearntheprescribedactivityPoints,EighthsemesterGradeCardshallbeissuedonlyafterearning therequiredactivityPoints.Studentsshallbeadmittedfortheawardofdegreeonlyafterthereleaseoftheeighthsemester Grade Card.

VISVESVARAYATECHNOLOGICALUNIVERSITY,BELAGAVI
SchemeofTeachingandExamination2018–19
OutcomeBasedEducation(OBE)andChoiceBasedCreditSystem(CBCS)(Effectivefromtheacademicyear2018–19)

VISEMESTER

Sl. No	Courseand Coursecode		CourseTitle	Teaching Department	Teaching Hours/Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration inhours	CIE Marks	SEEMarks	TotalMarks	
					L	T	P					
1	PCC	18ME61	Finite Element Methods		3	2	--	03	40	60	100	4
2	PCC	18ME62	Design of Machine Elements II		3	2	--	03	40	60	100	4
3	PCC	18ME63	Heat Transfer		3	2	--	03	40	60	100	4
4	PEC	18ME64X	ProfessionalElective-1		3	--	--	03	40	60	100	3
5	OEC	18ME65X	Open Elective-A		3	--	--	03	40	60	100	3
6	PCC	18MEL66	Computer Aided Modelling and Analysis Lab		--	2	2	03	40	60	100	2
7	PCC	18MEL67	Heat Transfer Lab		--	2	2	03	40	60	100	2
8	MP	18MEMP68	Mini-project		--	--	2	03	40	60	100	2
9	Internship	--	Internship	To be carried out during the vacation/ of VI and VII semesters and/or VII and VIII semesters.								
				TOTAL	**15**	**10**	**06**	**24**	**320**	**480**	**800**	**24**

Note:PCC:Professionalcore,PEC:ProfessionalElective,OE:OpenElective,MP:Mini-project.

ProfessionalElective-1

Coursecodeunder18XX64X	Course Title	Coursecodeunder18XX64X	Course Title
18ME641	**Non-Traditional Machining**	18ME644	**Vibrations and Noise Engineering**
18ME642	**Refrigeration and Air conditioning**	18ME645	**Composite Materials Technology**
18ME643	**Theory of Elasticity**	18ME646	**Entrepreneurship Development**

Open Elective-A

Mini-project work:
Based on the ability/abilities of the student/s andrecommendationsofthementor,asingledisciplineoramultidisciplinaryMini-projectcanbeassignedtoan individual student or to a group havingnotmorethan4 students.

CIE procedure for Mini-project:

(i) Singlediscipline: TheCIEmarksshallbeawardedbyacommitteeconsistingoftheHeadoftheconcernedDepartmentandtwoseniorfacultymembers of the Department, one of whom shall be the Guide.

The CIE marks awarded for the Mini-project work, shall be based on the evaluation ofprojectreport,projectpresentationskillandquestionandanswersessionintheratio50:25:25.Themarksawardedfortheprojectreportshallbethesameforall the batch mates.

(ii) Interdisciplinary: ContinuousInternalEvaluationshallbegroupwiseatthecollegelevelwiththeparticipationofalltheguidesofthecollege.The CIE marks awarded for the Mini-project, shall be based on the evaluation of project report, project presentation skill and question and answers session in the ratio 50:25:25.Themarks awarded for the project report shall be the same for all the batchmates.

SEE for Mini-project:

(i) Singlediscipline: ContributiontotheMini-projectandtheperformanceofeachgroupmembershallbeassessedindividuallyinthesemesterendexamination(SEE) conducted at the department.

(ii) Interdisciplinary: ContributiontotheMini-projectandtheperformanceofeachgroupmembershallbeassessedindividuallyinsemesterendexamination(SEE) conducted separately at the departments to which the student/belongs to.

Internship: All the students admitted to III year of BE/B. Tech shall have to undergo mandatory internship of 4 weeks during the vacation of VI and VII semesters and /or VII and VIII semesters. A University examination shall be conducted during VIII semester and the prescribed credit shall be included in VIII semester. Internship shall be considered as a headofpassingandshallbeconsideredfortheawardofdegree.Those,whodonot take-up/completetheinternshipshallbedeclaredfailandshallhavetocompleteduringsubsequentUniversityexaminationaftersatisfyingtheinternship requirements.

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OutcomeBasedEducation(OBE)andChoiceBasedCreditSystem(CBCS)(Effectivefromtheacademicyear2018–19)

VIISEMESTER

Sl. No	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration inhours	CIE Marks	SEE Marks	Total Marks	
					L	T	P					
1	PCC	18ME71	Control Engineering		3	--	--	03	40	60	100	3
2	PCC	18ME72	Computer Aided Design and Manufacturing		3	--	--	03	40	60	100	3
3	PEC	18ME73X	ProfessionalElective-2		3	--	--	03	40	60	100	3
4	PEC	18ME74X	ProfessionalElective-3		3	--	--	03	40	60	100	3
5	OEC	18ME75X	Open Elective-B		3	--	--	03	40	60	100	3
6	PCC	18MEL76	Computer Integrated Manufacturing Lab		--	2	2	03	40	60	100	2
	PCC	18MEL77	Design Lab		--	2	2	03	40	60	100	2
7	Project	18MEP78	ProjectWorkPhase-1		--	--	2	--	100	--	100	1
8	Internship	--	Internship	(If not completed during the vacation of VI and VII semesters, it shall be Carried out during the vacation of VII and VIII semesters)								
				TOTAL	**15**	**04**	**06**	**18**	**340**	**360**	**700**	**20**

ProfessionalElective-2

Coursecodeunder18XX73X	**Course Title**	**Course codeunder18XX73X**	**Course Title**
18ME731	**Design for Manufacture**	18ME734	**Total Quality Management**
18ME732	**Automation and Robotics**	18ME735	**Operations Research**
18ME733	**Computational Fluid Dynamics**		

ProfessionalElectives-3

Coursecodeunder18XX74X	**Course Title**	**Course codeunder18XX74X**	**Course Title**
18ME741	**Additive Manufacturing**	18ME744	**Mechatronics**
18ME742	**Emerging Sustainable Building Cooling Technologies**	18ME745	**Project Management**
18ME743	**Theory of Plasticity**		

Projectwork:
Based on the ability/abilities of the student/s and recommendations of the mentor, a single discipline or a multidisciplinary project can be assigned to an individual student or to a group having not more than 4 students. In extraordinary cases, like the funded projects requiring students from different disciplines, the project student strength canbe5or6.

CIEprocedureforProjectWorkPhase-1:

(i) Singlediscipline: TheCIEmarksshallbeawardedbyacommitteeconsistingoftheHeadoftheconcernedDepartmentandtwoseniorfacultymembersof the Department, one of whom shall be the Guide.

The CIE marks awarded for the project work phase -1, shall be based on the evaluation of the project work phase -1 Report (covering Literature Survey, Problem identification, Objectives and Methodology), project presentation skill and question and answer session in the ratio 50:25:25.Themarks 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 guides of the college. Participation of external guide/s, if any, is desirable.

The CIE marksawardedfortheprojectworkphase-1,shallbebasedontheevaluationof projectworkphase-1Report(covering Literature Survey, Problem identification, Objectives and Methodology), 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.

Internship: All the students admitted to III year of BE/B. Tech shall have to undergo mandatory internship of 4 weeks during the vacation of VI and VII semesters and /or VII and VIII semesters. A University examination shall be conducted during VIII semester and the prescribed credit shall be included in VIII semester. Internship shall be considered as a headofpassingandshallbeconsideredfortheawardofdegree.Those,whodonot take-up/completetheinternshipshallbedeclaredfailandshallhavetocompleteduringsubsequentUniversityexaminationaftersatisfyingtheInternshiprequirements.

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VISVESVARAYATECHNOLOGICALUNIVERSITY,BELAGAVI
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OutcomeBasedEducation(OBE)andChoiceBasedCreditSystem(CBCS)(Effectivefromtheacademicyear2018–19)

VIIISEMESTER

Sl. No	Course and Course code		Course Title	Teaching Department	Teaching Hours/Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration inhours	CIEMarks	SEEMarks	TotalMarks	
					L	T	P					
1	PCC	18ME81	**Energy Engineering**		3	--	--	03	40	60	100	3
2	PEC	18ME82X	**ProfessionalElective-4**		3	--	--	03	40	60	100	3
3	Project	18MEP83	**Project Work Phase- 2**		--	--	2	03	40	60	100	8
4	Seminar	18MES84	**Technical Seminar**		--	--	2	03	100	--	100	1
5	Internship	18XXI85	Internship	Completed during the vacation/s Of VI and VII semesters and/or VII and VIII semesters.)				03	40	60	100	3
				TOTAL	**06**	**--**	**04**	**15**	**260**	**240**	**500**	**18**

Note: PCC: Professional Core, PEC: Professional Elective.

ProfessionalElectives-4

Course codeunder18XX82X	Course Title	Course codeunder18XX82X	Course Title
18ME821	**CNC Machine Tools**	18ME824	**Automobile Engineering**
18ME822	**Tribology**	18ME825	**Tool Design**
18ME823	**Non-Destructive Testing and Evaluation**	18ME826	**Fracture Mechanics**

Project Work

CIEprocedureforProjectWorkPhase-2:

(i) Singlediscipline: TheCIEmarksshallbeawardedbyacommitteeconsistingoftheHeadoftheconcernedDepartmentandtwoseniorfacultymembers of the Department, one of whom shall be the Guide.

The CIE marksawardedfortheprojectworkphase-2,shallbebasedontheevaluationofprojectworkphase-2Report,projectpresentationskillandquestionand answer session in the ratio 50:25:25.The marksawardedfortheprojectreportshallbethesameforallthebatchmates.

(ii) Interdisciplinary: ContinuousInternalEvaluationshallbegroupwiseatthecollegelevelwiththeparticipationofallguidesofthecollege.Participationofexternalguide/s, if any, is desirable.

The CIE marksawardedfortheprojectworkphase-2,shallbebasedontheevaluationofprojectworkphase-2Report,projectpresentationskillandquestionand answer session in the ratio 50:25:25.The marksawardedfortheprojectreportshallbethesameforallthebatchmates.

SEEforProjectWorkPhase-2:

(i) Single discipline: Contribution to the project and the performance of each group member shall be assessed individually in semester end examination(SEE) conducted at the department.

(ii) Interdisciplinary: Contributiontotheprojectandtheperformanceofeachgroupmembershallbeassessedindividuallyinsemesterendexamination(SEE)conductedseparatelyatthedepartmentstowhichthestudent/sbelongsto.

Internship: Those,whohavenotpursued/completedtheinternship,shallbedeclaredasfailandhavetocompleteduringsubsequentUniversityexaminationaftersatisfyingtheinternshiprequirements.

SAMBHRAM
INSTITUTE OF TECHNOLOGY

M S Palya, Bangalore-560097

Department of Mechanical Engineering

B.E.MechanicalEngineering
OutcomeBasedEducation(OBE)andChoiceBasedCreditSystem(CBCS)
SEMESTER -VI

OPENE LECTIV E-A

Course Code	18ME65X	CIE Marks	40
TeachingHours/Week(L:T:P)	3:0:0	SEE Marks	60
Credits	03	Exam Hours	03

Students can select any one of the open electives offered by other DepartmentsexpectthosethatareofferedbytheparentDepartment(Forsyllabus, pleaserefertotheconcernedprogrammesyllabusbookorVTUwebsitevtu.ac.inmaybevisit ed.).Selectionofan open elective shall not be allowed if,

- The candidate has studied the same course during the previous semesters of the programme.
- ThesyllabuscontentofopenelectiveissimilartothatoftheDepartmentalcorecoursesorprofessionalelectives.
- A similar course, under any category, is prescribed in the higher semesters of the programme.

RegistrationtoelectivesshallbedocumentedundertheguidanceofProgrammeCoordinator/Advisor/Mentor.

Sl.No.	Board and the Department offering the Electives		Course Sl. No.	Course Code under 18XX65X	Course Title
1	ME	Mechanical Engineering	1	18ME651	**Non-Conventional Energy Sources**
			2	18ME652	**World Class Manufacturing**
			3	18ME653	**Supply Chain Management**
			4	18ME654	**Advanced Materials Technology**

B.E Mechanical Engineering
OutcomeBasedEducation(OBE)andChoiceBasedCreditSystem(CBCS)SEME STER -VII

OPENELECT IVE-B

Course Code	18ME75X	CIE Marks	40
Teaching Hours/Week(L:T:P)	3:0:0	SEE Marks	60
Credits	03	Exam Hours	03

Students can select any one of the open electives offered by other DepartmentsexpectthosethatareofferedbytheparentDepartment(Forsyllabus,pleaserefertotheconcernedprogrammesyllabus book or VTU website vtu. ac. In maybe visited.).
Selection of an open elective shall not be allowed if,

- Thecandidatehasstudiedthesamecourseduringtheprevioussemestersoftheprogramme.
- ThesyllabuscontentofopenelectiveissimilartothatoftheDepartmentalcorecoursesorprofessionalelectives.
- A similar course, under any category, is prescribed in the higher semesters of the programme.

RegistrationtoelectivesshallbedocumentedundertheguidanceofProgrammeCoordinator/Advisor/Mentor.

SlNO	Board and the Department offering the Electives		Course Sl No	Course Code under 18XX75X	Course Title
2	ME	Mechanical Engineering	1	18ME751	**Energy and Environment**
			2	18ME752	**Automotive Engineering**
			3	18ME753	**Industrial Safety**
			4	18ME754	**Optimization Techniques**

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SCHEME AND SYLLABUS -2021

VISVESVARAYATECHNOLOGICALUNIVERSITY,BELAGAVI
B.E. in MECHANICALENGINEERING
SchemeofTeachingandExaminations2021
Outcome Based Education(OBE) and Choice Based Credit System(CBCS)
(Effective from the academic year 2021 - 22)

IIISEMESTER

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	BSC21MAT31	Transform Calculus, Fourier Series And Numerical Techniques	Maths	2	2	0	0	03	50	50	100	3
2	IPCC 21ME32	Metal casting, Forming And Joining Processes	TD:ME PSB:ME	3	0	2	0	03	50	50	100	4
3	IPCC 21ME33	Material Science and Engineering	TD:ME PSBME	3	0	2	0	03	50	50	100	4
4	PCC 21ME34	Thermodynamics	TD:ME PSBME	2	2	0	0	03	50	50	100	3
5	PCC 21MEL35	Machine Drawing and GD&T	TD:ME PSBME	0	0	2	0	03	50	50	100	1
6	UHV 21UH36	Social Connect and Responsibility	Any Department	0	0	1	0	01	50	50	100	1
7	HSMC 21KSK37/47	Samskruti kaKannada	TD and PSB: HSMC	1	0	0	0	01	50	50	100	1
	HSMC 21KBK37/47	Balake Kannada										
	OR											
	HSMC 21CIP37/47	Constitution of India And Professional Ethics										
8	AEC21ME38X	Ability Enhancement Course – III	TD: Concerned department PSB: Concerned Board	If offered as Theory Course				01	50	50	100	1
				0	2	0						
				If offered as lab. course				02				
				0	0	2						
								Total	**400**	**400**	**800**	**18**

		NMDC21NS83	National Service Scheme(NSS)	NSS	All students have to register for any one of the course namely National Service Scheme, Physical Education (PE)(Sports and

9		NMDC21 PE83	Physical Education (PE)(Sportsand Athletics)	PE	Athletics) and Yoga with the concerned coordinator of the course during the first week of III semester. The activities shall be carried out from (for 5 semesters) between III semester to VIII semester. SEE in the above courses shall be conducted during VIII semester examinations and the accumulated CIE marks shall be added to the SEE marks. Successful completion of the registered course 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 calander prepared for
		NMDC21 YO83	Yoga	Yoga	

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VISVESVARAYATECHNOLOGICALUNIVERSITY,BELAGAVI
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SchemeofTeachingandExaminations2021
Outcome-Based Education(OBE) and Choice Based Credit System(CBCS)
(Effective from the academic year 2021 - 22)

IVSEMESTER

Sl. No	Course and Course Code	Course Title	Teaching Department(TD) and Question PaperSetting	Teaching Hours /Week				Examination				Credits
				Theory Lecture	Tutorial	/	Self-Study	Duration in hours	CIE Marks	SEE Marks	Total Marks	
				L	T	P	S					
1	BSC21ME41	Complex Analysis, Probability and Linear Programming.	Maths	2	2	0	0	03	50	50	100	3
2	IPCC 21ME42	Machining Science and Jigs & Fixtures	TD: ME PSB:ME	3	0	2	0	03	50	50	100	4
3	IPCC 21ME43	Fluid Mechanics	TD: ME PSB:ME	3	0	2	0	03	50	50	100	4
4	PCC 21ME44	Mechanics of Materials	TD: ME PSB:ME	2	2	0	0	03	50	50	100	3
5	AEC 21BE45	Biology For Engineers	BT,CHE, PHY	2	0	0	0	02	50	50	100	2
6	PCC21MEL 46	Mechanical Measurements and Metrology Lab	TD:ME PSB:ME	0	0	2	0	03	50	50	100	1
7	HSMC 21KSK37/47	Samskrutika Kannada	HSMC	1	0	0	0	01	50	50	100	1
	HSMC 21KBK37/47	BalakeKannada										
	OR											
	HSMC 21CIP37/47	Constitution of India& Professional Ethics										
8	AEC21XX48X	Ability Enhancement Course- IV	TD and PSB: Concerned department	If offered as theory Course: 0	2	0		01	50	50	100	1
				If offered as lab. Course: 0	0	2		02				
9	UHV 21UH49	Universal Human Values	Any Department	1	0	0		01	50	50	100	1

10	INT21INT49	Inter/Intra Institutional Internship	Evaluation By the appropriate authorities	Completed during the intervening period of II and III semesters by students admitted to first year of BE./B.Tech and during the intervening period ofIII and IV semesters by Lateral entry students admitted to III semester.	3	100	--	100	2

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(Effective from the academic year 2021 - 22)

VSEMESTER

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	AEC21XX56	Research Methodology& Intellectual Property Rights	TD: Any Department PSB:As Identified by University	2	0	0	0	02	50	50	100	2
7	HSMC21CIV57	Environmental Studies	TD: Civil/ Environmental /Chemistry/ Biotech. PSB:CivilEngg	2	0	0	0	1	50	50	100	1
8	AEC21ME58X	Ability Enhancement Course-V	Concerned Board	If offered as Theory courses: 0	2	0		01	50	50	100	1
				If offered as lab. Courses: 0	0	2		02				
								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)		

SAMBHRAM INSTITUTE OF TECHNOLOGY

M S Palya, Bangalore-560097

Department of Mechanical Engineering

VISVESVARAYATECHNOLOGICALUNIVERSITY,BELAGAVI
B.E. in MECHANICALENGINEERING
SchemeofTeachingandExaminations2021
Outcome-Based Education (OBE) and Choice Based Credit System(CBCS)
(Effective from the academic year 2021 - 22)

VISEMESTER

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	CNCProgrammingand3-D Printing Lab	TD:ME PSB:ME	0	0	2	0	03	50	50	100	1
7	MP21MEMP 67	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

Note: HSMC: Humanity and Social Science & Management Courses, **IPCC:** Integrated Professional Core Course, **PCC:** Professional Core Course, **PEC:** Professional Elective Courses, O**EC**–Open Elective Course, **MP** –Mini Project, INT – Internship.

L–Lecture,T–Tutorial,P-Practical/Drawing,S–SelfStudyComponent,CIE:ContinuousInternalEvaluation,SEE: Semester End Examination.

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Swappable VII and VIII SEMESTER

VIISEMESTER

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	PCC 21ME71	Automation and Robotics	TD:ME PSB:ME	3	0	0	0	3	50	50	100	3
2	PCC 21ME72	Control Engg	TD:ME PSB:ME	3	0	0	0	3	50	50	100	2
3	PEC 21ME73X	Professional elective Course-II	TD:ME PSB:ME	3	0	0	0	3	50	50	100	3
4	PEC 21ME74X	Professional elective Course-III	TD:ME PSB:ME	3	0	0	0	3	50	50	100	3
5	OEC 21ME75X	Open elective Course-II	TD: ME PSB:ME	3	0	0	0	3	50	50	100	3
6	Project 21MEP76	Project work		Two contact hours /week for interaction between the faculty and students.				3	100	100	200	10
								Total	**350**	**350**	**700**	**24**

VIIISEMESTER

Sl. No	Course and Course Code		Course Title	Teaching Department	Teaching Hours/Week				Examination				Credits
					Theory Lecture	Tutorial	/	Self-Study	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	Seminar 21XX81		Technical Seminar		One contact hour /week for interaction between the faculty and students.				--	100	--	100	01
2	INT21INT82		Research Internship/ Industry Internship		Two contact hours /week for interaction between the faculty and students.				03 (Batch wise)	100	100	200	15
3	NCMC	21NS83	National Service Scheme (NSS)	NSS	Completed during the intervening period of III semester to VIII semester.				--	50	50	100	0
		21PE83	Physical Education(PE) (Sports and Athletics)	PE									
		21YO83	Yoga	Yoga									
									Total	**250**	**150**	**400**	**16**

Professional Elective–II

21ME731	Additive Manufacturing	21ME734	MEMS and Micro system Technology
21ME732	Total Quality Management	21ME735	Design for Manufacturing and Assembly
21ME733	Refrigeration and Airconditioning		
ProfessionalElective–III			
21ME741	Advanced Vibrations and Condition Monitoring	21ME744	Product Design and Ergonomics
21ME742	Theory and Design of IC Engines		
21ME743	Advanced Turbomachines		

Open Electives-II offered by the Department to other Department students			
21ME751	Non-traditional Machining	21ME7533	Operations Research
21ME752	Hydraulics and Pneumatics		

Note:PCC: ProfessionalCoreCourse,**PEC:**ProfessionalElectiveCourses,**OEC**–OpenElectiveCourse,**AEC**–Ability Enhancement Courses.
L–Lecture,T–Tutorial,P-Practical/Drawing,S–SelfStudyComponent,CIE:ContinuousInternalEvaluation,SEE: Semester End Examination.

Note: VII and VIII semesters of IV year of the programme

(1) InstitutionscanswapVIIandVIIISemesterSchemeofTeachingandExaminationstoaccommodateresearch 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

PROJECTWORK(21XXP75): The objective of the Project work is

- **(i)** Toencourageindependentlearningandtheinnovativeattitudeofthestudents.
- **(ii)** Todevelopinteractiveattitude,communicationskills,organization,timemanagement,andpresentationskills.
- **(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 instill responsibilities to one self and others.
- **(viii)**Totrainstudentstopresentthetopicofprojectworkinaseminarwithoutanyfear,facetheaudienceconfidently, enhance communication skills, involve in group discussion to present and exchange ideas.

CIE procedure for Project Work:

(1) Singlediscipline: TheCIEmarksshallbeawardedbyacommitteeconsistingoftheHeadoftheconcernedDepartment and two senior faculty members of the Department, one of whom shall be the Guide.
TheCIEmarksawardedfortheprojectwork,shallbebasedontheevaluationofprojectworkReport,projectpresentation 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: ContinuousInternalEvaluationshallbegroup-wiseatthecollegelevelwiththeparticipationofall