VISVESVARAYA TECHNOLOGICAL UNIVERSITY

BELAGAVI

Scheme of Teaching and Examinations

M.Tech. in Electronics and Communication Engineering (Biomedical Signal Processing and Instrumentation)

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

Sl. No	Course Type	Course Code	Course Title	Theory (L)	Practical/ Seminar (P)	Tutorial/SDA (T/SDA)	Duration in hours	CIE Marks	SEE Marks	Total Marks	Credits
1	IPCC	MLBI201	Speech Signal Processing	03	02	00	05	50	50	100	4
2	PCC	MLBI202	Advanced Digital Image Processing	02	00	02	04	50	50	100	3
3	PCC	MLBI203	Advanced Bio Medical Signal Processing	02	00	02	04	50	50	100	3
4	PCC	MLBI204	Wireless technologies for medical Applications	02	00	02	04	50	50	100	3
5	PEC	MLBI255x	**Professional Elective III**	02	00	02	04	50	50	100	3
6	PEC	MLBI256x	**Professional Elective IV**	02	00	02	04	50	50	100	3
7	PECL	MLBIL207	Speech and Image Processing Lab	00	04	00	04	50	50	100	2
8	AEC/SEC	MLBI288x	Ability/Skill Enhancement Course (Offline/Online)	00 / 01	02 / 00	-- / --	02 / 01	50	50	100	1
								400	400	800	22

Professional Elective III		Professional Elective IV	
MLBI255A	Photonics for Medical imaging	MLBI256A	Bio-materials and Artificial organs
MLBI255B	Medical Informatics & Expert systems	MLBI256B	ARM Embedded System design
MLBI255C	Neural Network & Fuzzy logic in Medicine	MLBI256C	Healthcare Data Analytics
MLBI255D	Statistical Signal Processing	MLBI 256D	Ergonomics

Skill Enhancement Course			
MLBI**288A**	Refer www.online.vtu.ac.in	MLBI **288C**	Refer www.online.vtu.ac.in
MLBI**288B**	Refer www.online.vtu.ac.in	MLBI **288D**	Refer www.online.vtu.ac.in

Note: **BSC**-Basic Science Courses, **PCC**: Professional core. **IPCC**-Integrated Professional Core Courses, **PCC(PB):** Professional Core Courses (Project Based), **PCCL**-Professional Core Course lab **,NCMC**- None Credit Mandatory Course, ,**L**-Lecture**, P**-Practical, **T/SDA-**Tutorial **/** Skill Development Activities(Hours are for Interaction between faculty and students) **MRMI19**- Research Methodology and IPR (**Online**) for the students who have **not studied** this course in the Undergraduate level. This course is not counted for vertical progression; Students have to qualify for the award of the master's degree.

BSC: Basic Science Courses: Courses like Mathematics/ Science are the prerequisite courses that the concerned engineering stream board of Studies will decide.   **PCC: Professional Core Course:** Courses related to the stream of engineering, which will have both CIE and SEE components, students have to qualify

in the course for the award of the degree. **Integrated Professional Core Course (IPCC)**: Refers to a Professional Theory Core Course Integrated with practicals of the same course. The IPCC's theory part shall be evaluated 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. **Project Based Learning Course (PCC(PB):** Project Based Learning course is a professional core Course only Students have to complete a project out of learning from the course and SEE will be viva voce on project work. **PCCL: Professional Core Course Laboratory:** Practical courses whose CIE will be evaluated by the class teacher and SEE will be evaluated by the two examiners.

Skill development activities: Under Skill development activities in a concerning course, the students should
1. Interact with industry (small, medium, and large).
2. Involve in research/testing/projects to understand their problems and help creative and innovative methods to solve the problem.
3. Involve in case studies and field visits/ fieldwork.
4. Accustom to the use of standards/codes etc., to narrow the gap between academia and industry.
5. Handle advanced instruments to enhance technical talent.
6. Gain confidence in the modelling of systems and algorithms for transient and steady-state operations, thermal study, etc.
7. Work on different software/s (tools) to simulate, analyze and authenticate the output to interpret and conclude.

All activities should enhance student's abilities to employment and/or self-employment opportunities, management skills, Statistical analysis, fiscal expertise, etc.Students and the course instructor/s are to be involved either individually or in groups to interact together to enhance the learning and application skills of the study they have undertaken. The students with the help of the course teacher can take up relevant technical –activities that will enhance their skills. The prepared report shall be evaluated for CIE marks.

For the students who are willing to take up a two-semester duration Industry/Research Internship Leading to Project work /start-up

III SEMESTER (A)

Sl. No	Course	Course Code	Course Title	Teaching Hours /Week			Examination					Credits
				Theory	Practical/ Mini–Project/ Internship	Tutorial/ Skill Development Activities	Duration in hours	CIE Marks	SEE Marks	Total Marks		
				L	P	SDA						
1		MLBI311x	(Online Courses) 12 weeks duration							100		3
2	PEC/MDC	MLBI312x	(Online Courses)12 weeks duration							100		3
		MLBI313x	(Online Courses)12 weeks duration							100		3
3	INT	**MINT384**	Research Internship /Industry-Internship leading to project work/ Startup	Two-semester duration, SEE in the IV semester which leads to project work /start-up			03	100	---	100		3
			TOTAL							400		12

IV SEMESTER (A)

Sl. No	Course	Course Code	Course Title	Teaching Hours /Week		Examination				Credits
				Theory	Practical/Field	Duration in hours	CIE Marks	SEE Marks Viva voce	Total Marks	
				L	P					
1	INT	MINT481	Research Internship / Industry Internship Leading to Project Work/Start-up	Two Semester Duration		03	100	100	200	12
2	PROJ	MPRJ482	Project			03	100	100	200	16
			TOTAL			06	200	200	400	28

INT: Industry/ Research Internship leading to the project work /startup**PRJ**: Project work outcome of Internship (Project Phase-II is Viva voce SEE)

Taking up a two-semester Industry/Research Internship that leads to project work or a start-up can be a highly rewarding experience for students. It allows them to apply theoretical knowledge in

practical settings, gain valuable industry or research experience, and potentially develop innovative solutions or business ideas. Here are some key steps and considerations for students pursuing such an internship:

Industry Internship: The main objective of the industry internship is to ensure that the intern is exposed to a real-world environment and gain practical experience. Often, it may be a practical exposure to the theory that has been learned during the academic period. The industry internship helps students understand of analytical concepts and tools, hone their skills in real-life situations, and build confidence in applying the skills learned.

Research Internship: A research internship is an opportunity for students or early career professionals to gain hands-on experience in conducting research under the guidance of a mentor or within a research team. These internships can take place in academic institutions, research organizations, government agencies, or private companies

Research /Industry Internship: In the third-semester Students have to be in touch with a guide/mentor/coordinator and regularly submit the report referred to the progress internship. Based on the progress report the Guide/Mentor/coordinator has to enter the CIE marks at the end of the 3rd semester. At the beginning of the 4th semester, students have to define the project topic out of the learning due to the Internship, upon completion of the project work he/she has to attend the SEE at the parent Institute.

Internship Leading to Start-up: An internship that leads to a startup is an exciting pathway, blending real-world experience with entrepreneurial ambition. Here's a comprehensive guide to transitioning an internship experience into launching your startup: 1) Maximize your internship experience, 2) Identifying Viable Business Ideas, 3) Research and Validation 4) Building a Business Plan 5) Networking and Mentorship 6) Securing Funding 7) Establishing Startup 8) Launching and Marketing. By following these steps, you can effectively transition from an internship to launching a successful startup. This journey requires dedication, resilience, and a willingness to learn and adapt.

Mxxx311 to 313:MOOC courses of 12 weeks duration are the courses suggested by the Board of Studies of the University and will be displayed on www.online.vtu.ac.in. The online courses selected should not be the same as those studied in the first and second semesters of the program. The student will not be eligible to get their degree if they unintentionally select online courses that match previously finished courses. These courses are not considered for the vertical progression; however, qualifying for these courses and earning the credits is a must for the award of the degree. It is permitted to complete these online MOOC courses either in 3rd semester or in 4th semester.