

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

BELAGAVI



## Scheme of Teaching and Examinations

### **M.Tech, in Electronics and Communication Engineering (Specialization in Digital Communication Engineering)**

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

**Specialization in –(Digital Communication Engineering)**

**II SEMESTER**

Sl. No	Course	Course Code	Course Title	Teaching Hours /Week			Examination			Credits	
				Theory	Practical/ Seminar	Tutorial/ Skill Development Activities	Duration in hours	CIE Marks	SEE Marks		Total Marks
				L	P	T/SDA					
1	IPCC	MLDC201	Antenna Theory and Design	03	02	–	03	50	50	100	4
2	PCC	MLDC202	Advanced Communication Systems	03	–	–	03	50	50	100	3
3	PCC	MLDC203	Cryptography and Network Security	03	–	–	03	50	50	100	3
4	PCC	MLDC204	Wireless Sensor Networks	03	–	–	03	50	50	100	3
5	PEC	MLDC215x	Professional elective III	03	–	–	03	50	50	100	3
6	PEC	MLDC216x	Professional elective IV	03	–	–	03	50	50	100	3
7	PCCL	MLDCL207	Cryptography and Network Security Lab	--	04	--	03	50	50	100	2
8	AEC/SEC	MLDC258x	Ability/Skill Enhancement Course (Offline/Online)	00	02	---	02	50	50	100	1
				01	00	----	01				
<b>TOTAL</b>								<b>400</b>	<b>400</b>	<b>800</b>	<b>22</b>

Note: **PCC**: Professional core. **IPCC**-Integrated Professional Core Courses, **PCC(PB)**: Professional Core Courses (Project Based), **PCCL**-Professional Core Course lab, **PEC**- Professional Elective Courses, **MDC**- Multi-Disciplinary Courses  
, **L-Lecture, P-Practical, T/SDA-Tutorial / Skill Development Activities** (Hours are for Interaction between faculty and students)  
**L-Lecture, P-Practical, T/SDA-Tutorial / Skill Development Activities** (Hours are for Interaction between faculty and students)  
**PBLC**: Project Based Learning Course, **MPS**: Mini Project with Seminar/ Societal Project with Seminar

Professional elective III		Professional elective IV	
Course Code	Course title	Course Code	Course title
MLDC215A	Multimedia Over Communication Links	MLDC216A	High Speed Communication Networks
MLDC215B	Statistical Signal Processing	MLDC216B	Applied Cyber Security
MLDC215C	Probability and Random Process	MLDC216C	Optical Communication and Networking

MLDC215D	Simulation, Modeling and Analysis	MLDC216D	Error Control Coding	
<b>Ability / Skill Enhancement Courses</b>				
Course Code	Course title	L	T/SDA	P
MLDC258A	Modeling and Simulation of Antenna Using Simulation Tool	00	---	02
MLDC258B	MATLAB and Simulink	00	---	02
MLDC258C	Programming in Java	00	---	02
MLDC258D	Python Programming	00	---	02
<p><b>Note:</b></p> <p><b>Integrated Professional Core Course (IPCC):</b> Refers to a Professional Theory Core Course Integrated with practicals of the same course. 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.</p> <p><b>Project Based Learning Course (PBLC):</b> 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</p> <p><b>1 Mini Project/ Societal with Seminar:</b> This may be hands-on practice, survey report, data collection and analysis, coding, mobile app development, field visit and report preparation, modelling of system, simulation, analysing and authenticating, case studies, etc. It may be Techno Societal Project, technical Project work useful for the society.</p> <p>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. Students can present the seminar based on the completed mini-project/Societal Project. Participation in the seminar by all postgraduate students of the program shall be mandatory.</p> <p>The CIE marks awarded for Mini/Societal Project work and Seminar, shall be based on the evaluation of Mini/ Societal Project work and Report, Presentation skill and performance in Question-and-Answer session in the ratio 50:25:25. Mini-Project with Seminar shall be considered as a head of passing and shall be considered for vertical progression as well as for the award of degree. Those, who do not take-up/complete the Mini Project and Seminar shall be declared as fail in that course and have to complete the same during the subsequent semester. <b>There is no SEE for this course.</b></p>				

**Audit Courses /Ability Enhancement Courses Suggested by BOS (ONLINE courses):** **Audit Courses:** These are prerequisite courses suggested by the concerned Board of Studies. Ability Enhancement Courses will be suggested by the BoS if prerequisite courses are not required for the programs. **Ability Enhancement Courses:**

- These courses are prescribed to help students to enhance their skills in in fields connected to the field of specialisation as well allied fields that leads to employable skills. Involving in learning such courses are impetus to lifelong learning.
- The courses under this category are online courses published in advance and approved by the concerned Board of Studies.
- Registration to Audit /Ability Enhancement Course shall be done in consultation with the mentor and is compulsory during the concerned semester.
- In case a candidate fails to appear for the proctored examination or fails to pass the selected online course, he/she can register and appear for the same course if offered during the next session or register for a new course offered during that session, in consultation with the mentor.

The Audit Ability Enhancement Course carries no credit and is not counted for vertical progression. However, a pass in such a course is mandatory for the award of the degree.

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

<b>III SEMESTER (A)</b>											
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	PEC	MLDC311x	Professional Elective V (Online Courses)	03	00	00	03	100	---	100	3
2	PEC	MLDC312x	Professional Elective VI (Online Courses)	03	00	00	03	100	---	100	3
3	INT	<b>MINT383</b>	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	4
4	PROJ	MPRJ384	Project Phase-I				03	100	---	100	2
<b>TOTAL</b>				<b>06</b>	<b>00</b>	<b>00</b>	<b>12</b>	<b>400</b>	<b>---</b>	<b>400</b>	<b>12</b>
Note: <b>PEC:</b> Professional Elective Courses, <b>L-Lecture, P-Practical, T/SDA-Tutorial / Skill Development Activities</b> (Hours are for Interaction between faculty and students). <b>INT:</b> Internship: Research Internship / Industry Internship Leading to the project work /start-up, <b>PROJ: Project Phase-I:</b> Problem statement out of undergone Internship (Industry /Research) report submission											

<b>IV SEMESTER (A)</b>											
Sl. No	Course	Course Code	Course Title	Teaching Hours /Week		Examination				Credits	
				Theory	Practical /Field work	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	MPROJ482	Project Phase-II			03	100	100	200	16	
<b>TOTAL</b>				<b>00</b>	<b>00</b>	<b>06</b>	<b>200</b>	<b>200</b>	<b>400</b>	<b>28</b>	
<b>INT:</b> Industry/ Research Internship leading to the project work /startup <b>PROJ:</b> 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 3<sup>rd</sup> semester. At the beginning of the 4<sup>th</sup> 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.

**24LDC311 & 24LDC312:** 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](http://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 3<sup>rd</sup> semester or in 4<sup>th</sup> semester.

**For the students who are willing to take an Industry Internship for one semester duration and independent project work next semester**

VISVESVARAYATECHNOLOGICALUNIVERSITY,BELAGAVI SchemeofTeachingandExaminations–2024 <b>M.Tech.,Digital Communication Engineering (LDC)</b> Choice Based Credit System(CBCS) and Outcome Based Education(OBE)											
<b>III SEMESTER (B)</b>											
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	PEC	MLDC311x	Professional Elective V (Online Courses) 12 weeks duration	03	00	00	03	100	-	100	3
2	PEC	MLDC312x	Professional Elective VI (Online Courses) 12 weeks duration	03	00	00	03	100	-	100	3
3	PEC	MLDC313x	Professional Elective VI (Online Courses) 12 weeks duration	03	00	00	03	100	-	100	3
4	INT	MINT384	Industry Internship	One semester Duration			03	100	100	200	11
<b>TOTAL</b>				<b>09</b>	<b>00</b>	<b>00</b>	<b>12</b>	<b>400</b>	<b>100</b>	<b>500</b>	<b>20</b>

VISVESVARAYATECHNOLOGICALUNIVERSITY,BELAGAVI SchemeofTeachingandExaminations–2024 <b>M.Tech.,Digital Communication Engineering (LDC)</b> Choice Based Credit System(CBCS) and Outcome Based Education(OBE)											
<b>IV SEMESTER (B)</b>											
Sl. No	Course	Course Code	Course Title	Teaching Hours/Week		Examination				Credits	
				Theory	Practical/Fieldwork	Duration in hours	CIE Marks	SEE Marks Viva voce	Total Marks		
				L	P						
1	PROJ	MPROJ481	Project work	-	08	03	100	100	200	20	
<b>TOTAL</b>				<b>--</b>	<b>08</b>	<b>03</b>	<b>100</b>	<b>100</b>	<b>200</b>	<b>20</b>	

**Industry Internship:** The main objective of the industry internship is to ensure that the intern is exposed to a real-world environment and gains 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. The students who take up a one-semester Internship in the Industry have to appear SEE at the institute at the end of the semester as per the examination calendar.

**PROJECTWORK :** The objective of the Project work is

- To encourage independent learning and the innovative attitude of the students.
- To develop an interactive attitude, communication skills, organization, time management, and presentation skills.
- To impart flexibility and adaptability.
- To inspire team work.
- To expand intellectual capacity, credibility, judgment, and intuition.
- To adhere to punctuality, setting and meeting deadlines.
- To instill responsibilities to oneself and others.
- To train students to present the topic of project work in a seminar without any fear, face the audience confidently, enhance communication skills, involved in group discussions to present and exchange ideas.

**Project Work:** Students in consultation with the guide shall carry out literature survey/ visit industries to finalize the topic of the Project.

Subsequently, the students shall collect the material required for the selected project, prepare a synopsis, and narrate the methodology to carry out the project work. Each student, under the guidance of a Faculty, is required to

- Present the seminar on the selected project orally and/or through Power Point slides.
- Answer the queries and be involved in debate/discussion.
- Submit two copies of the typed report with a list of references.
- The participants shall take part in discussions to foster a friendly and stimulating environment in which the students are motivated to reach high standards and become self-confident

**CIE marks** for the project report (20 marks), seminar (20 marks) and question and answer (10 marks) shall be awarded (based on the quality of report and presentation skill, participation in the question-and-answer session by the student) by the committee constituted for the purpose by the Principal. The committee shall consist of internal guide and a faculty from the department with the senior most acting as the Chairperson.

**Semester End Examination** SEE marks for the project report (30 marks), seminar (10 marks) and question and answer session (10 marks) shall be awarded (based on the quality of the report and presentation skill, participation in the question and answer session) by the examiners appointed by the University.



**MLDC311 to MLDC313:** 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](http://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.

**For the students who are willing to take a research-leading paper publication in Q1/Q2/Q3 Journals and to a PhD Registration**

**III SEMESTER (C)**

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	PEC	MLDC311x	Professional Elective V (Online Courses) 12 weeks duration	03	00	00	03	100	-	100	3
2	PEC	MLDC312x	Professional Elective VI (Online Courses) 12 weeks duration	03	00	00	03	100	-	100	3
3	PEC	MLDC313x	Professional Elective VI (Online Courses) 12 weeks duration	03	00	00	03	100	-	100	3
4	PEC	MLDC314x	Professional Elective VI (Online Courses) 12 weeks duration	03	00	00	03	100	-	100	3
5	PROJ	MPROJ385	Project Phase-I	One semester Duration			03	100	---	100	6
<b>TOTAL</b>				<b>12</b>	<b>00</b>	<b>00</b>	<b>15</b>	<b>500</b>	<b>---</b>	<b>500</b>	<b>18</b>

VISVESVARAYATECHNOLOGICALUNIVERSITY,BELAGAVI

SchemeofTeachingandExaminations-2024

**M.Tech.,Digital Communication Engineering (LDC)**

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

**IV SEMESTER (C)**

Sl. No	Course	Course Code	Course Title	Teaching Hours/Week		Examination				Credits
				Theory	Practical/ Fieldwork	Duration in hours	CIE Marks	SEE Marks Viva voce	Total Marks	
				L	P					
1	PROJ	MPRJ481	Project work	-	08	03	100	100	200	22
<b>TOTAL</b>				<b>-</b>	<b>08</b>	<b>03</b>	<b>100</b>	<b>100</b>	<b>200</b>	<b>22</b>

The research section of the university has to announce the number of seats for M.Tech. students who are seeking PhD (research study) admission through a project leading to the publication of the paper in Q1/Q2/Q3 journals. Only full-time research work will be permitted in the university department or approved research centers of the affiliated colleges of the university (guidelines need to be set up). Based on seat availability, the students are permitted to register for project work leading to the publication of papers in Q1/Q2/Q3 journals and admission to research (PhD) in their 3rd semester of the M.Tech., program

**Project Phase-1** Project Phase-I, typically the initial phase in any project, is crucial as it lays the foundation for the entire project. This phase involves defining the project's scope, objectives, and initial planning. Here's a structured approach to effectively carry out Project Phase-I:

- **Project Charter:** Outlines the project's purpose, objectives, and stakeholders.
- **Scope Statement:** Defines the project boundaries and deliverables.
- **Requirements Document:** Captures all project requirements.
- **Project Plan:** Details the approach, timeline, and resource allocation.
- **Risk Management Plan:** Identifies and plans for potential risks.
- **Feasibility Study Report:** Assesses technical, economic, and operational feasibility.

Students in consultation with the guide shall carry out literature survey/visit industries to finalize the topic of the Project. Subsequently, the students shall collect the material required for the selected project, prepare a synopsis, and narrate the methodology to carry out the project work. Each student, under selected project orally and/or through power point slides.

- Answer the queries and be involved in debate/discussion.
- Submit two copies of the typed report with a list of references.
- The participants shall take part in discussions to foster a friendly and stimulating environment in which the students are motivated to reach high standards and become self-confident.

#### **Continuous Internal Evaluation (100 Marks).**

CIE marks for the project report (60 marks), seminar (20 marks) and question and answer (20marks) shall be awarded (based on the quality of report and presentation skill, participation in the question and answer session by the student) by the committee constituted for the purpose by the Principal. The committee shall consist of an internal guide and a faculty from the department with the senior most acting as the Chairperson.

**Project Work Phase-II:** Each student shall be involved in carrying out the project work jointly in constant consultation with internal guide and external guide and prepare the project report as per the norms of the university to avoid plagiarism. Phase II of a project typically involves the detailed execution of the planned activities, continuous monitoring and control of the project's progress, and making necessary adjustments to ensure the project stays on track. Keep detailed records of all project activities, decisions, and changes. Ensure all project documentation is organized and accessible. Conduct a final project review to evaluate overall performance, achievements, and lessons learned. Document best practices and areas for improvement for future projects.

**Paper Publication Process:** Publishing a research paper based on your project in a Q1/Q2/Q3 journal involves several key steps, from writing the manuscript to navigating the peer review process. Here's a comprehensive guide:

**Writing the Manuscript:** Choose a clear and concise title that accurately reflects the content. Write an abstract summarizing the research question, methods, results, and conclusions.

**Literature Review:** Review relevant existing research to establish the foundation of your study. Identify gaps that your research aims to fill.

**Methodology:** Describe the research design, methods, and procedures in detail. Include information on data collection, analysis, and any tools or software used.

**Results:** Present the findings of your research clearly and logically. Use tables, figures, and charts to illustrate key results.

**Discussion:** Interpret the results and explain their implications. Compare your findings with existing research and discuss any discrepancies or new insights.

**Conclusion:** Summarize the main findings and their significance. Suggest potential future research directions.

**References:** Cite all sources used in your research following the journal's citation style.

**Journal Selection:** Choose a journal that aligns with the scope and focus of your research. Consider the journal's impact factor (Q1, Q2, Q3) and audience.

**Review Journal Guidelines:** Carefully read the journal's submission guidelines and ensure your manuscript adheres to them.

**Prepare Your Manuscript:** Format your manuscript according to the journal's guidelines. Include all required sections and supplementary materials.

**Cover Letter:** Write a cover letter to the journal editor highlighting the significance of your research and why it fits the journal.

**Submit the Manuscript:** Use the journal's online submission system to submit your manuscript. Ensure all required information and documents are included.

**Semester End Examination** SEE marks for the project report (60 marks), seminar (20marks) and question and answer session (20 marks) shall be awarded (based on the qualityofreportandpresentationskill,participationinthequestionandanswersession)bythe examiners appointed by the University.

**MLDC311 to MLDC314:** 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](http://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.