

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous Institute, Affiliated to RGPV, Bhopal (M.P.) India)

NAAC Accredited with A++ Grade

Department of Electronics Engineering

Scheme of Evaluation

B. Tech. VI Semester (Electronics & Telecommunication Engineering)

S. No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted										Total Marks	Contact Hours per week			Total Credits	Mode of Teaching	Mode of Exam.	Duration of Exam
				Theory Slot				Practical Slot			MOOCs										
				End Sem. Exam.	End Term Evaluation		Continuous Evaluation		End Sem. Exam.	Lab work & Sessional	Continuous Evaluation	Assignment	Exam								
					Proficiency in subject /course	Mid Sem. Exam.	Quiz/ Assignment														
1.	200619	DC	Mobile Communication & 5G Networks	50	10	20	20	-	-	-	-	-	4	-	-	4	Blended	PP	2 Hrs		
2.	200616	DC	VLSI Design	50	10	20	20	60	20	20	60	-	-	3	-	2	4	Blended	PP	2 Hrs	
3.		DE	Departmental Elective* (DE-1)	-	-	-	-	-	-	25	75	-	3	-	-	3	Online	MCQ	1.5 Hrs		
4.		OC	Open Category (OC-1)**	50	10	20	20	-	-	-	-	-	3	-	-	3	Blended	PP	2 Hrs		
5.	200617	MC	Artificial Intelligence & Machine Learning	50	10	20	20	60	20	20	60	-	-	3	-	2	4	Blended	MCQ	1.5 Hrs	
6.	200618	DLC	Minor Project-II	-	-	-	-	60	40	-	60	-	-	-	-	4	2	Offline	SO	-	
7.	200XXX	CLC	Novel Engaging Course (Informal Learning)	-	-	-	-	50	-	-	50	-	-	-	-	2	1	Blended	SO	-	
Total				200	40	80	80	230	80	40	75	25	75	16	-	10	21	-	-		
8.		MAC	Intellectual Property Rights (IPR)	50	10	20	20	-	-	-	100	-	2	-	-	GRADE	Online	MCQ	1.5 Hrs		
Summer Internship-III (On Job Training) for Four weeks duration: Evaluation in VII Semester																					
Additional Course for Honours or Minor Specialization										Permitted to opt for maximum two additional courses for the award of Honours or Minor specialization											

(for batch admitted in academic session 2020-21)

^{\$}proficiency in course/subject-includes the weightage towards ability/skill/competence/knowledge level/ expertise attained etc. in that particular course/subject.

^{\$\$}MCQ: Multiple Choice Question ^{\$\$\$}AO: Assignment + Oral ^{\$\$\$}PP: Pen Paper ^{\$\$\$}SO: Submission + Oral

^{*}Course run through SWAYAM/NPTEL/ MOOC Learning Based Platform with credit transfer

^{**} Course run in traditional mode

*This course run through SWAYAM/NPTEL/ MOOC platform

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Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot			Total Marks	Contact Hr/week			Total Credits
			End Sem Marks	Proficiency in Subject course	Mid Sem Marks	Quiz/ Assignment Marks	End Sem Mark	Lab work & Sessional Mark	Skill based mini project		L	T	P	
140619/200619	DC	Mobile Communication & 5G Networks	50	10	20	20				100	4	-	-	4

Mobile Communication & 5G Networks (200619/140619)

Course Objective: The objective of the course is to provide an understanding of wireless communication system, its evolution, standards, and comparison of recent technologies and overview of 5G technology.

Unit I: Introduction to cellular mobile systems: Basic Cellular System, Cellular communication infrastructure: Cells, Clusters, Cell Splitting, Frequency reuse concept, Cellular system components, Operations of cellular systems, Handoff/Handover, Channel assignment, Fixed and dynamic, Cellular interferences: Co-Channel and adjacent channel and sectorization.

Unit II: Channel Models: Properties of mobile radio channels – Intersymbol interference – Multipath and fading effects – Interleaving and diversity – Multiple access schemes (TDMA, FDMA, CDMA, SDMA) – Interuser interference – Traffic issues and cell capacity.

Unit III: Modulations techniques for mobile communication: Pulse shaping, Linear and non-linear Modulation techniques, constant envelop modulation, QPSK, MSK, GMSK. Spread spectrum modulation techniques - Direct sequence and Frequency Hopping Spread Spectrum and their applications.

Unit IV: Introduction to modern cellular standards: 2G Architecture such as GSM and CDMA based – 2.5G – GPRS: GPRS and its features – 3G standard details such as UMTS – Introduction to LTE, Basic concept of massive MIMO.

Unit V: Overview of 5G Broadband Wireless Communications: 5G potential and applications; Usage scenarios: enhanced mobile broadband (eMBB), ultra reliable low latency communications (URLLC), massive machine type communications (MMTC), D2D communications, V2X communications; Spectrum for 5G and sharing.

Text Books:

- Jonathan Rodriguez, “Fundamentals of 5G Mobile Networks”, John Wiley & Sons.
- 4G, LTE-Advanced Pro and The Road to 5G Third Edition, Elsevier publication

Reference Books:

- V.K.Garg, J.E.Wilkes, “Principle and Application of GSM”, Pearson Education, 5th edition, 2008.
- T.S. Rappaport, “Wireless Communications: Principles and Practice”, second edition, Prentice Hall publication, 2002.

Course Outcomes:

After successful completion of the course, students will be able to:

- CO1. Describe** mobile communication system.
- CO2. Compare** multiple access techniques for signal transmission.
- CO3. Explain** modulation techniques for mobile communication system.
- CO4. Analyze** modern cellular standards.
- CO5. Discuss** 5G technology in mobile communication.