



TEERTHANKER MAHAVEER UNIVERSITY

(Established under Govt. of U. P. Act No. 30, 2008)

Delhi Road, Moradabad (U.P)

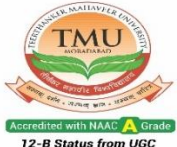
Website: www.tmu.ac.in

COURSE FILE

Faculty of Engineering

DEPARTMENT OF COMPUTER SCIENCE& ENGINEERING

Course Name	:	Mobile Communication
Course Code	:	ECS 612
Faculty Member	:	Dr. Gulista khan
Program	:	B.Tech CSE
Semester	:	VI
Academic Year	:	2024-25

	Index	SESSION-2024-2025
		SEM- 6th Subject: Mobile Communication Code: ECS612 Dept. /Sec: CSE

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FACULTY OF ENGINEERING
B.Tech. CSE NBA Accreditation 2025

INSTITUTE

VISION

To be recognised as institute of excellence, promoting value based education in computer science and engineering with multidisciplinary research, innovation and consultancy services to the society.

MISSION

1. To provide holistic education through outcome based learning.
2. To promote interdisciplinary learning and research for serving the needs of entire global community.
3. To inculcate innovation in graduates using technological advancements for the development of computational solutions.
4. To prepare graduates to be continuous learners by inculcating people skills.

DEPARTMENT

VISION

To be recognised as department of excellence, promoting value-based education in computer science and engineering with multidisciplinary research, innovation and consultancy services to the society.

MISSION

1. To provide value based education by implementing outcome-based teaching and learning process.
2. To promote inter-disciplinary research that for serving the needs of entire global community.
3. To inculcate desire for innovation in graduates using technological advancements for the development of effective solutions.
4. To prepare graduates as continuous learners by inculcating professional skills and ethical responsibilities.

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

1. **Fundamental:** To prepare the graduates for career and proficiency in Computer Science and Engineering.
2. **Industry Ready:** To imbibe technical and aptitude skills related to Computer Science and Engineering to provide the best solution to industrial and societal problems.
3. **Continuous Learning:** To prepare graduates for pursuing higher education and life-long learning.
4. **Entrepreneurship Skills:** To imbibe entrepreneurship, leadership, effective communication and business skills through innovation, incubation and start-up activities.
5. **Social and Moral Ethics:** To develop awareness among the graduates about the various social responsibilities related to engineering ethics, human values and ecological understanding.

PROGRAM-SPECIFIC OUTCOMES (PSO)

PSO–1:Developing skills for creating computational solutions with emerging technologies, programming languages, mathematical foundations, algorithmic principles and open source platforms to solve complex engineering problems.

PSO–2:Understanding the evolutionary changes in computing by applying standard practices and skills acquired through computer engineering to provide solutions with innovative ideas and interdisciplinary research.

PSO–3:Applying modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur and pursue higher studies in their respective domains.

PROGRAM OUTCOMES FOR ENGINEERING:

PO – 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO – 2	Problem analysis& Solving: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO – 3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO – 4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO – 5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO – 6	Social Interaction & effective citizenship: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO – 7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO – 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO – 9	Attitude (Individual and team work): Function effectively as an individual, and as member or leader in diverse teams, and in multidisciplinary settings.
PO – 10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clean instructions.
PO – 11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO – 12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
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Academic Calendar



TEERTHANKER MAHAVEER UNIVERSITY

(Established under Govt. of U. P. Act No. 30, 2008)

Delhi Road, Moradabad (U.P)

E-Mail: registrar@tmu.ac.in

Phone No.: 9837933666

Email registrar@tmu.ac.in

Ref. No : TMU/R.O./2023-24/ Academic Calendar/02

Date: 28.06.2024

Circular

Subject: Academic Calendar Session 2024-25 (Except Medical & Dental).

The Academic Calendar of the University for various programmes [except for Medical & Dental programmes] is proposed, herewith. The calendar is suggestive and the dates mentioned may change depending upon the unforeseen situations that may arise owing to causes beyond control.

For Semester System

S. No.	Events/Particulars		Dates	
Odd Semester				
			For 1 st Year	For 2 nd Year Onwards
1	Course allocation and tagging on ERP for odd semester		July 15, 2024	July 15-20, 2024
2	Submission of time table and upload on ERP for odd Semester		July 25, 2024	
3	Upload of e-contents for odd semester on website		Up to July 31, 2024	
4	Commencement of classes	Nursing Programmes	August 01, 2024	August 01, 2024
		All other Programmes (Including Student Induction Program for 1-3 weeks, as applicable)	August 08, 2024	
5	Registration of semester course and open elective courses (if applicable) by the students	Nursing Programmes	August 01-05, 2024	August 08-12, 2024
		All other Programmes	August 08-30, 2024	
6	Sharing of Course Handouts with Students		August 30, 2024	
7	CT-I*	All Programmes and Programmes under NEP-2020 for batches admitted in session 2024-25	October 14-18, 2024	October 14-18, 2024
8	CT-II*	All Programmes except programmes under NEP-2020 for batches admitted in session 2024-25	November 18-22, 2024	November 18-22, 2024
9	End of odd semester Classes (For all programmes)		December 04, 2024	

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Individual Faculty Time Table
ODD Semester Time Table (w.e.f. Jan. 2024)

Faculty Name: Dr. Gulista khan

Session:

2024-25

Room No: 5107

Day/ Timings	9:30 –10:25	10:30– 11:25	11:30-12:25	12:30-01:25	01:25-2:25	2:25-3:10	3:10-3:55
MON					L U N C H		
TUE							
WED			ECS612				
THU			ECS612				
FRI			ECS612				
SAT							

[illegible]

<u>Study & Evaluation Scheme</u>	
<u>SUMMARY</u>	
<i>Institute Name</i>	COLLEGE OF COMPUTING SCIENCES & INFORMATION TECHNOLOGY
<i>Programme</i>	<i>Bachelor of Technology(Computer Science & Engineering)</i>
<i>Duration</i>	<i>Four Years full time(Eight Semesters)</i>
<i>Medium</i>	<i>English</i>
<i>Minimum Required Attendance</i>	<i>75%</i>
<u>Credits</u>	
<i>Minimum Credits Required for Degree</i>	<i>186</i>

Evaluation Scheme

Assessment:					
Evaluation			Internal	External	Total
Theory			40	60	100
Practical/ Dissertations/ Project Reports/ Viva-Voce			50	50	100
Class Test-1	Class Test-2	Class Test-3	Assignment(s)	Attendance& Participation	Total
Best two out of three					
10	10	10	10	10	40
Duration of Examination			External	Internal	
			3 Hours	1.5 Hours	

Class participation 10 % (regular basis) and attendance

Individual Assignment 10% (after 20 sessions)

CT1 Exam 10 % (Refer Academic Calendar)

CT2 Exam 10 % (Refer Academic Calendar)

CT3 Exam 10 % (Refer Academic Calendar)

Note: there is a consideration of best two CT's.

<u>CourseCode:</u> ECS612	ProfessionalCoreCourse-14 B.Tech (CSE) Semester VI MOBILECOMMUNICATION	L-3 T-0 P-0 C-3
<u>CourseOutcomes:</u>	On completion of the course, the students will be :	
CO1.	Understanding the basic concept of mobile computing, wireless networks, structure of mobile computing based application.	
CO2.	Understanding various schemes like Fixed Assignment Schemes, Random Assignment Schemes, Reservation Based Schemes.	
CO3.	Understanding the mobile IP, Key functionality of IP, Choose the required functionality at each layer for given application.	
CO4.	Understanding the hand-off process in mobile communication	
CO5.	Analyzing solution for each functionality at each layer x Use simulator tools and design Ad hoc networks	
Course Content:		
Unit-1:	Introduction: Issues in mobile computing, Study of Electromagnetic Spectrum: Radio wave, Microwave, Infrared, Overview of wireless communication, Cellular concept, sharing of Wireless channels: FDMA, TDMA, CDMA.	8 Hours
Unit-2:	Global System for Mobile Communication (GSM): Architecture, Mobility Management, and Network signaling; General Packet Radio Services (GPRS): GPRS architecture, GPRS Network nodes	8 Hours
Unit-3:	Mobile Data Communication: WLANs (Wireless LANs); IEEE 802.11 standard; Mobile IP; Wireless Application Protocol (WAP); Mobile Internet Standards; WAP Gateway and Protocols Wireless Markup Languages (WML).	8 Hours
Unit-4:	Third Generation (3G) Mobile Services: International Mobile Telecommunications 2000 (IMT 2000) vision; Wideband Code Division Multiple Access (W-CDMA); and CDMA 2000: Quality of services in 3G.	8 Hours
Unit-5:	Wireless Local Loop (WLL): Architecture, Technologies; Global Mobile Satellite Systems; Case studies of Iridium and Global star systems; Bluetooth technology and Wi-Max.	8 Hours
<u>TextBooks:</u>	1. Lin, Y.B. and Chlamatac, I, <i>Wireless and mobile Networks Architecture</i> , John Wiley & Sons	

<u>ReferenceBooks:</u>	1. Talukdar,A.K.andYaragal,R.,<i>MobileComputing</i>,TataMcGrawHill. 2. Theodore,S.R.,<i>WirelessCommunication-Principlesand Practices</i>, Pearson Education. *Latesteditionsof allthesuggestedbooksare recommended.	
<u>Additional</u> <u>Electronic</u> <u>Reference</u> <u>Material:</u>	https://nptel.ac.in/courses/117/102/117102062/ https://www.youtube.com/watch?v=lbaqg6P2-8k	

A. Course Perspective.

- To impart fundamental concepts in the area of mobile computing, to provide a computer systems perspective on the converging areas of wireless networking, embedded systems, and software, and to introduce selected topics of current research interest in the field.
- Course Outline:

Unit-1:	Introduction: Issues in mobile computing, Study of Electromagnetic Spectrum: Radio wave, Microwave, Infrared, Overview of wireless communication, Cellular concept, sharing of Wireless channels: FDMA, TDMA, CDMA.
Unit-2:	Global System for Mobile Communication (GSM): Architecture, Mobility Management, and Network signaling; General Packet Radio Services (GPRS): GPRS architecture, GPRS Network nodes
Unit-3:	Mobile Data Communication: WLANs (Wireless LANs); IEEE 802.11 standard; Mobile IP; Wireless Application Protocol (WAP); Mobile Internet Standards; WAP Gateway and Protocols Wireless Markup Languages (WML).

Unit-4:	Third Generation (3G) Mobile Services: International Mobile Telecommunications 2000 (IMT 2000) vision; Wideband Code Division Multiple Access (W-CDMA); and CDMA 2000: Quality of services in 3G.
Unit-5:	Wireless Local Loop (WLL): Architecture, Technologies; Global Mobile Satellite Systems; Case studies of Iridium and Global star systems; Bluetooth technology and Wi-Max.

E Session Plan:

Sessions Nos.	Topics	Pedagogy	References	Session outcome (Bloom's Taxonomy)	Course Outcome (COs)
1.	Issues in mobile computing	Discussion	T-3	L1	CO1
2.	Study of Electromagnetic Spectrum: Radio wave	Lecture, Classroom activity	T- 3	L1	CO1
3.	Microwave, Infrared	Lecture, Classroom activity	T- 1	L1& L2	CO1
4.	Overview of wireless communication	Lecture, Classroom activity	T- 2	L1& L2	CO1
5.	Cellular concept	Lecture, Classroom activity	T- 3	L1	CO1
6.	Sharing of Wireless channels FDMA	Lecture, Classroom activity	T- 3	L1	CO1
7.	TDMA	Lecture, Classroom activity	T- 2	L1	CO1
8.	CDMA.	Lecture, Classroom activity	T- 1	L1	CO1
9.	Global System for Mobile Communication (GSM): Architecture,	Lecture, Classroom activity ⁷	T- 2	L1	CO1

10.	GSM: Mobility Management	Lecture, Classroom activity	T- 3	L1	CO1
11.	GSM: Network signaling	Lecture, Classroom activity	T- 3	L1	CO1
12.	GSM: Call Routing	Lecture, Classroom activity	T- 3	L1	CO1
13.	GSM: Location Update, Interfaces	Lecture, Classroom activity	T- 3	L4	CO2
14.	GPRS architecture	Lecture, Classroom activity	T- 3	L1	CO1
15.	GPRS Network nodesSGSN	Lecture, Classroom activity	T- 3	L2	CO2
16.	GPRS Network nodes-GGSN	Lecture, Classroom activity	T- 3	L2	CO2
17.	WLANs (Wireless LANs)	Lecture, Classroom activity	T- 2	L2	CO2
18.	IEEE 802.11 standard	Lecture, Classroom activity	T- 3	L3	CO4
19.	Mobile IP nodes	Lecture, Classroom activity	T- 1	L2	CO3
20.	Mobile IP- Packet delivery	Lecture, Classroom activity	T- 2	L2	CO3
21.	WAP Gateway and Protocols- WDP, WTLS	Lecture, Classroom activity	T- 3	L1	CO3
22.	WTS, WSP	Lecture, Classroom activity	T- 3	L1	CO3
		activity			
23.	WAE Protocol	Lecture, Classroom activity	T- 3	L1	CO3
24.	Wireless Markup Languages (WML).	Lecture, Classroom activity	T- 3	L1	CO3

25.	Third Generation (3G) Mobile Services: International Mobile Telecommunications 2000 (IMT 2000)	Lecture, Classroom activity	T- 3	L2	CO4
26.	International Mobile Telecommunications 2000 (IMT 2000)	Lecture, Classroom activity	T- 3	L2	CO4
27.	UMTS Architecture	Lecture, Classroom activity	T- 3	L2	CO4
28.	WCDMA features	Lecture, Classroom activity	T- 3 & R-1	L2	CO4
29.	WCDMA features	Lecture, Classroom activity	T- 3 & R-1	L2	CO4
30.	CDMA 2000	Lecture, Classroom activity	T- 3 & R-1	L2	CO2
31.	CDMA 2000 features	Lecture, Classroom activity	T- 3 & R-1	L2	CO2
32.	Quality of services in 3G.	Lecture, Classroom activity	T- 3 & R-1	L1	CO2
33.	Wireless Local Loop (WLL): Architecture	Lecture, Classroom activity	T- 3	L1	CO5
34.	WLL Technologies	Lecture, Classroom activity	T- 3	L1	CO5
35.	Global Mobile Satellite Systems	Lecture, Classroom activity	T- 3	L1	CO5
36.	Case studies of Iridium	Lecture, Classroom activity	T- 3	L1	CO5
37.	Global star systems	Lecture, Classroom activity	T- 3	L1	CO5
38.	Bluetooth technology	Lecture, Classroom	T- 3	L3	CO5

		activity			
39.	Bluetooth Protocol Stack	Lecture, Classroom activity	T- 3	L3	CO5
40.	Wi-Max architecture	Lecture, Classroom activity	T- 3	L3	CO5

L1= Remember, L2= Understand, L3= Apply, L4= Analyze, L5= Evaluate and L6= Create

F. Evaluation Scheme: Faculty led Continuous Evaluation (As applicable to the concerned programme)

Assessment:					
Evaluation			Internal	External	Total
Theory			40	60	100
Practical/ Dissertations/ Project Reports/ Viva-Voce			50	50	100
Internal Assessment					
Class Test-1	Class Test-2	Class Test-3	Assignment(s)	Attendance& Participation	Total
Best two out of three					
10	10	10	10	10	40
Duration of Examination		Internal :1.5 Hours			
Duration of Examination		External: 3 Hours			
To qualify the course a student is required to secure a minimum of 45% marks in aggregate including the semester end examination and teachers continuous evaluation.(i.e. both internal and external).A candidate who secures less than 45% of marks in a course shall be deemed to have failed in that course. The student should have at least 45% marks in aggregate to clear the semester.					
Evaluation of practical course [From Second Year Onwards]					

Practical Courses Internal Evaluation (50 marks)			
TWO EXPERIMENTS	ATTENDANCE	VIVA	TOTALINTERNAL
30	10	10	50
Practical Courses External Evaluation (50 marks)			
TWO EXPERIMENTS	FILE WORK	VIVA	TOTALINTERNAL
30	10	10	50

Class participation 10 % (regular basis) and attendance

Individual Assignment 10% (after 20 sessions)

CT1 Exam 10 % (Refer Academic Calendar)

CT2 Exam 10 % (Refer Academic Calendar)

CT3 Exam 10 % (Refer Academic Calendar)

Note: there is a consideration of best two CT's.

G. Alignment/Mapping of COs & POs (Course Articulation Matrix)

(a) CO Mapping with Assessment tools

Course Outcomes	CT-1	CT-2	CT-3	Assignment	Project Report	Semester End Theory Exam
CO1	✓		✓	✓	NA	✓
CO2	✓		✓	✓	NA	✓
CO3	✓	✓	✓	✓	NA	✓

CO4		✓	✓	✓	NA	✓
CO5		✓	✓	✓	NA	✓

(b) Mapping /Alignment of COs with POs (Programme Articulation Matrix)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1			1						
CO2	1	2		1								
CO3	3		2			1	1					
CO4	3	3			1							
CO5	3	3			1	1						1

CO	PSO1	PSO2	PSO3
CO1	3	2	2
CO2	2	3	2
CO3	2	3	3
CO4	3	3	2
CO5	3	3	3

Justification of CO-PO Alignment Matrix

Department of Computer Science and Engineering, TMU- College of Engineering

Proposed CO-PO Articulation

Course Name: Mobile Communication

Course Code: ECS612

Session 2024-25

	CO	Course Outcome Statement	Remember, Understand
CO1	ECS612.1	Understand the security challenges in mobile communication systems, such as data encryption, authentication, and security protocols. Learn the design and optimization of mobile communication networks, including cellular planning, capacity planning, and network management.	Understand
CO2	ECS612.2	Gain an understanding of the various generations of mobile communication and their evolution in terms of speed, technology, and features.	Understand
CO3	ECS612.3	Understand and apply principles of WAP, WLAN, IEEE standards, and Mobile IP to design, implement, and optimize mobile communication systems with seamless connectivity, mobility, and security.	Understand, Apply
CO4	ECS612.4	Understand and apply the principles of IMT2000, CDMA, and WCDMA technologies to evaluate and optimize Quality of Service (QoS) in 3G mobile communication systems.	Understand, Apply
CO5	ECS612.5	Understand and apply the principles of Bluetooth, WiMAX, WLL, and satellite systems (Globalstar and Iridium) to design, evaluate, and optimize wireless communication networks for global connectivity and mobility.	Understand, Apply

Course Code	CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
ECS612	CO1	ECS612.1	3	1	1		1						
	CO2	ECS612.2	1	2		1							
	CO3	ECS612.3	3		2		1	1					
	CO4	ECS612.4	3	3			1						
	CO5	ECS612.5	3	3			1	1					1

Course Code	CO		PSO1	PSO2	PSO3
ECS612	CO1	ECS612.1	3	2	2
	CO2	ECS612.2	2	3	2
	CO3	ECS612.3	2	3	3
	CO4	ECS612.4	3	3	2
	CO5	ECS612.5	3	3	3

Justification of Proposed CO-PO Articulation

PO No.	Program Outcome	Course Outcome	Relevance	Justification
PO1	Engineering Knowledge	CO1	HIGH	This CO requires students to apply fundamental knowledge of mobile communication systems, security protocols, and optimization techniques, which aligns with PO1, as it involves using core engineering principles in mobile communication.
		CO2	LOW	Understanding the evolution of mobile communication systems (from 1G to 5G and beyond) requires knowledge of engineering principles applied to telecommunication technologies. This aligns with PO1, as it builds on core engineering concepts and the progression of wireless communication systems.
		CO3	HIGH	The understanding of WAP, WLAN, IEEE standards, and Mobile IP requires applying technical knowledge from telecommunication engineering, wireless networks, and protocols, which corresponds to PO1.
		CO4	HIGH	Understanding IMT2000, CDMA, and WCDMA technologies requires a solid foundation in telecommunications engineering, which is reflected in PO1.
		CO5	HIGH	This CO involves understanding various wireless communication systems, including Bluetooth, WiMAX, and satellite systems, all of which require engineering knowledge. This corresponds to PO1, as it requires a comprehensive understanding of different communication technologies.

PO2	Problem analysis	CO1	LOW	Identifying security challenges and designing mobile network systems involves recognizing complex problems and analyzing them, directly relating to PO2. The ability to troubleshoot, secure, and optimize mobile communication systems is a key component of problem analysis.
		CO2	MEDIUM	Analyzing the technological evolution of mobile networks requires the ability to assess how various generations have addressed problems like speed, bandwidth, and connectivity. Students will apply problem analysis to understand the technological advancements in each generation
		CO4	HIGH	Evaluating and optimizing QoS in 3G systems requires designing solutions that meet the specific needs of users, including traffic management and network reliability. This directly maps to PO3.
		CO5	HIGH	The design, evaluation, and optimization of these wireless communication systems to ensure global connectivity directly align with PO3. It emphasizes practical application and innovation in creating solutions that meet connectivity requirements.
PO3	Design/development of solutions	CO1	LOW	This CO involves designing secure, optimized mobile networks. Cellular planning, capacity planning, and security protocols are part of designing solutions, which aligns with PO3.
		CO3	MEDIUM	This CO is centered on the practical application of knowledge to design, implement, and optimize mobile communication systems. It involves hands-on application of technical knowledge to create solutions, which aligns with PO3.
PO4	Conduct investigations of complex problems	CO2	LOW	The evolution of mobile communication involves complex technical challenges that require in-depth investigation. Understanding the changing needs in wireless networks and their technical solutions is part of investigating these problems and solutions.
PO5	Modern Tool Usage	CO4	LOW	To optimize QoS in 3G mobile systems, students will need to utilize modern tools like network simulators and

				optimization algorithms. This reflects PO5, which focuses on using modern tools for problem-solving and system optimization.
		CO5	LOW	Optimizing these systems often involves using simulation tools and network analyzers, which aligns with PO5, emphasizing the application of modern tools in designing and improving network performance.
PO6	The engineer and society	CO1	LOW	Designing secure communication networks has a direct societal impact, especially in terms of data security and privacy. PO6 is relevant because students need to understand how their work impacts users and society in terms of ethical standards and security implications.
		CO3	LOW	The ability to design systems that ensure connectivity, mobility, and security in mobile communication networks has a significant societal impact, affecting how people access and use mobile services, thus aligning with PO6.
		CO5	LOW	Global satellite and wireless networks like Globalstar and Iridium have a significant societal impact, especially in remote or underserved areas. The development of such systems helps improve communication across the globe, which is an example of how engineers influence society positively (PO6).
PO7	Environment and sustainability	CO3	LOW	WLAN and Mobile IP contribute to efficient use of network resources, which can have implications for reducing energy consumption and improving the sustainability of communication networks, aligning with PO7.
PO12	Lifelong Learning	CO5	LOW	Implementing ad hoc networks involves management and integration.
PSO1		CO1	HIGH	Security mechanisms involve cryptographic algorithms, protocol design, and computational techniques, which directly relate to PSO1.
		CO2	MEDIUM	Network planning requires computational modeling, simulation, and optimization algorithms (PSO1).

		CO3	MEDIUM	It fosters foundational knowledge for future innovation (PSO1, PSO3).
		CO4	HIGH	This CO is deeply technical and practical, requiring strong computational and implementation skills (PSO1).
		CO5	HIGH	Designing and integrating various wireless systems demand computational thinking and open-source tools (PSO1).
PSO2		CO1	MEDIUM	Knowledge of evolving threats and cross-domain security practices ties into interdisciplinary research (PSO2).
		CO2	HIGH	It applies engineering principles to real-world and evolving telecom scenarios, fitting PSO2.
		CO3	HIGH	Analyzing the historical and technological shifts in mobile communication builds awareness of computing evolution (PSO2)
		CO4	HIGH	It integrates modern standards and protocols relevant to research and innovation (PSO2)
		CO5	HIGH	It aligns with evolving computing practices and interdisciplinary domains (PSO2) and opens paths for innovation, startups, or advanced studies (PSO3).
PSO3		CO1	MEDIUM	It also supports learners pursuing security-based careers or research (PSO3).
		CO2	MEDIUM	PSO3 is addressed through skills in network planning tools and entrepreneurship opportunities.
		CO3	HIGH	It fosters foundational knowledge for future innovation (PSO1, PSO3).
		CO4	MEDIUM	Supports hands-on skills applicable to careers and entrepreneurship (PSO3).
		CO5	HIGH	It aligns with evolving computing practices and interdisciplinary domains (PSO2) and opens paths for innovation, startups, or advanced studies (PSO3).

- 1 indicates the strength of correlation between CO and PO is Weak,**
- 2 indicates the strength of correlation between CO and PO is Medium,**
- 3 indicates the strength of correlation between CO and PO is High**

H. Book and References

R1: Text Books-

1. Lin, Y. B. and Chlamatac, I, Wireless and mobile Networks Architecture, John Wiley & Sons
2. Talukdar, A. K. and Yaragal, R., Mobile Computing, Tata McGraw Hill.
3. Theodore, S. R., Wireless Communication- Principles and Practices, Pearson Education.

* Latest editions of all the suggested books are recommended.

Web references should be used from:

- NPTEL / SWAYAM
- e-PG Pathashala
- MOOCs
- Other Government initiatives <https://www.education.gov.in/en/ict-initiatives> / UP Govt. MOOC
- Institution LMS

E-content Web Links

- University website subject notes link
 - <https://www.tmu.ac.in/college-of-computing-sciences-and-it/study-material>
- Personal google website link
 - <https://sites.google.com/view/vivekkc/home>

I. Additional Reading

Guidelines: The guidelines are available as record with the institution project based learning and departmental library rading.

J. Student's roles & responsibilities

Guidelines: All students must read these guidelines carefully and understand them fully

1. All students must be seated in the class within 05 minutes of the commencement of the session. The class room will be bolted from inside after this time period.
2. You are expected to read all topics/cases etc. before coming to the class.
3. All students are expected to participate actively in discussions that take place in the class room.

4. You will have to maintain 100 % attendance in the class. Leave shall be granted only with prior permission for urgent & essential work only.
5. You will submit all types of assignments within given time frame.
6. You will work in team & contribute to the team functions.
7. You will be asked to make presentations in your class.
8. You will undertake field and real time projects.
9. You will actively engage yourself in all activities of the class. Any absence will be dealt with separately according to the code of conduct.
10. You will come in the class properly dressed and neatly trimmed hair with a prescribed dress code.

Student List

Course Name : Mobile Communication

Course Code : ECS612

S.No.	Enrollment No.	Student Name
1	TCA2209001	AADI JAIN
2	TCA2209002	AADITYA JAIN
3	TCA2209006	ABHAY KUMAR
4	TCA2209007	ABHIJEET SHARMA
5	TCA2209009	ADEESH JAIN
6	TCA2209010	ADITI JAIN
7	TCA2209011	ADITYA ANISH JAIN
8	TCA2209014	ADITYA WAGHE
9	TCA2209015	AGAM JAIN
10	TCA2209018	AKHIL CHAUHAN
11	TCA2209020	AMAN CHAUHAN
12	TCA2209023	AMAN KUMAR
13	TCA2209028	ANEKANT JAIN
14	TCA2209032	ANSH KUMAR VASHISHTHA
15	TCA2209036	ARJIT PHOGAT
16	TCA2209039	ARPITA SRIVASTAVA
17	TCA2209041	ARYAN JAIN
18	TCA2209047	BHANU PRATAP SINGH
19	TCA2209048	BHARTI SHARMA
20	TCA2209051	BHUMIKA JAIN
21	TCA2209052	DAKSH JAIN
22	TCA2209058	DEEYA JAIN
23	TCA2209059	DEVANSH BHARADWAJ

24	TCA2209062	DIVYANSH JAIN
25	TCA2209063	DRASHTI JAIN
26	TCA2209065	HAMZA FARHAT
27	TCA2209069	HARSHIT KUMAR
28	TCA2209070	HEMANT JAIN
29	TCA2209071	HEMANT PANDEY
30	TCA2209075	JAIN AMAN AJAY
31	TCA2209076	JANVI CHAUHAN
32	TCA2209079	KASHISH JAIN
33	TCA2209080	KASHISH RASTOGI
34	TCA2209085	LAKI SAINI
35	TCA2209088	MANSI CHOUDHARY
36	TCA2209107	NITISHA JAIN
37	TCA2209109	NAMAN JAIN
38	TCA2209112	NIKHIL JAIN
39	TCA2209115	NISHANT CHAUHAN
40	TCA2209120	PAYAL JAIN
41	TCA2209122	PRAKASH RAJ
42	TCA2209126	PRASHANT PATEL
43	TCA2209133	RAHUL KUMAR
44	TCA2209140	RAVIKANT SHARMA
45	TCA2209146	RITIK KUMAR
46	TCA2209147	RIYA JAIN
47	TCA2209149	ROHAN KANCHAN SAXENA
48	TCA2209155	SAMARTH SAXENA
49	TCA2209173	SHREYANSH JAIN
50	TCA2209175	SUBRAT JAIN
51	TCA2209180	TANISHKA JAIN

52	TCA2209181	TANVI JAIN
53	TCA2209184	UDAY JAIN
54	TCA2209185	UDIT JAIN
55	TCA2209187	VANSHIKA TRIPATHI
56	TCA2209193	YAMINI JAIN
57	TCA2209194	YUVRAJ SINGH
58	TCA2209204	LAXMI
59	TCA2209094	MOHD GUL SHEEMAB
60	TCA2209102	MOHD SANIB
61	TCA2311002	ANKUR JAIN
62	TCA2311003	AYAZ ARIF KHAN
63	TCA2311004	AYUSHI BHATNAGAR
64	TCA2311005	BHANU PRATAP
65	TCA2311007	RAJ PRATAP
66	TCA2311008	YOGESH VERMA

Faculty of Engineering

FIRST INTERNAL EXAMINATION (CT-1)

Year: 3rd	Semester: VIth	Academic Session: 2024-25
Course Code: ECS-612	Course Name: Mobile Communication	
Duration: 90 minutes	Max. Marks: 30	

*Bloom Level {1-Remembering, 2-Understanding, 3-Applying, 4-Analyzing, 5-Evaluating, 6-Creating}

Attempt all questions.

1.	SHORT QUESTION	Max Marks	Unit	Bloom Level*	CO
	<u>Answer any five questions</u>				
A	What is Mobile Computing? What are its applications?	(2)	I	(BTL-1)	CO1
B	Why “Hexagon” cell shape is preferred to other shapes for analytical purposes?	(2)	I	(BTL-1)	CO1
C	Discuss the different issues in Mobile Computing.	(2)	I	(BTL-1)	CO2
D	Differentiate features of GSM and GPRS.	(2)	II	(BTL-2)	CO1
E	Explain NSS unit of GSM.	(2)	II	(BTL-1)	CO2
F	What do you understand by Electromagnetic Spectrum? Arrange Radio, Microwave, Gamma, x-rays in increasing order of frequency.	(2)	I	(BTL-2)	CO2
G	Explain the concept of frequency reuse in cellular system.	(2)	I	(BTL-1)	CO2
H	Explain the features of a cellular system.	(2)	II	(BTL-1)	CO2
	LONG QUESTIONS				
2.	A	Explain the detailed architecture of General Packet Radio Services with the functions of its two network nodes.	(10)	II	(BTL-2) CO1

	OR					
	B	What are the different multiple access technologies in wireless communication? Explain each with suitable diagrams.	(10)	II	(BTL-2)	CO1
3.	A	Explain the detailed architecture of Global System for Mobile Communication (GSM) with appropriate diagram and functions of each component.	(10)	II	(BTL-2)	CO2
	OR					
	B	Explain the GSM hierarchy? Also explain the process of location update in GSM mobility management.	(10)	II	(BTL-2)	CO2

CT2



Faculty of Engineering

Second INTERNAL EXAMINATION (CT-2)

Year: IIIrd	Semester: VIth	Academic Session: 2024-25
Course Code: ECS-612	Course Name: Mobile communication	
Duration: 90 minutes	Max. Marks: 30	

*Bloom Level {1-Remembering, 2-Understanding, 3-Applying, 4-Analyzing, 5-Evaluating, 6-Creating}

Attempt all questions.

1.	SHORT QUESTION	Max Marks	Unit	Bloom Level*	CO
	<u>Answer any five questions</u>				
	A Explain Mobile IP and its process.	(2)	III	(BTL-1)	CO3
	B Explain Wireless markup language.	(2)	III	(BTL-1)	CO3
	C Explain WLAN architecture with diagram.	(2)	III	(BTL-1)	CO3
	D Explain layer structure used in IEEE802.11.	(2)	III	(BTL-2)	CO3
	E Explain mobile internet standard.	(2)	IV	(BTL-1)	CO4
	F Explain services used in 3G.	(2)	IV	(BTL-2)	CO4
	G Explain UMTS and its application.	(2)	IV	(BTL-1)	CO4
	H Explain SGSN and GGSN working.	(2)	IV	(BTL-1)	CO4
	LONG QUESTIONS				

2.	A	Explain IEEE 802.11 standard used in wi-fi technology	(10)	III	(BTL-2)	CO3
OR						
	B	Explain IMT-2000 architecture and its applications.		IV	(BTL-2)	CO4
3.	A	Explain wireless application protocol (WAP) with layer diagram.	(10)	III	(BTL-2)	CO3
OR						
	B	Explain wide code division multiple access (W-CDMA) in brief.		IV	(BTL-2)	CO4

CT3



Faculty of Engineering

THIRD INTERNAL EXAMINATION (CT-3)

Program Name: B. Tech. (CSE)

Year: 3rd	Semester:	Academic Session: 2024-25
Course Code: ECS-612	Course Name: Mobile communication	
Duration: 90 minutes	Max. Marks: 30	

*Bloom Level {1-Remembering, 2-Understanding, 3-Applying, 4-Analyzing, 5-Evaluating, 6-Creating}

Attempt all questions.

1.	SHORT QUESTION	MM	Unit	BTL	CO
	<u>Answer any five questions</u>				
	A. Define mobile computing	(2)	1	1	1
	B. Illustrate the concept of cellular communication with a simple diagram.	(2)	1	1	1
	C. Define GPRS and list its main network components	(2)	2	2	2
	D. What is the function of a WAP Gateway	(2)	3	2	3
	E. Explain the architecture of a GPRS network with a labeled diagram	(2)	3	2	3
	F. What is W-CDMA and how is it different from standard CDMA?	(2)	4	2	4

	G.	Compare GPRS and WLAN in terms of architecture, speed, and applications.	(2)	3	3	3
	H.	Distinguish between WML and HTML in terms of syntax, usage, and device compatibility.	(2)	4	3	4
	LONG QUESTIONS					
2.	A	Differentiate between Bluetooth and Wi-Max in terms of data rate, range, and application.	(10)	5	4	5
	OR					
	B	Compare the satellite constellation structures of Iridium and Globalstar.	(10)	5	4	5
3.	A	Create a comparative case study report on Iridium and Globalstar systems, focusing on performance, cost, and coverage.	(10)	5	5	5
	OR					
	B	Evaluate the suitability of Wi-Max as a replacement for broadband in remote areas.	(10)	5	5	5

Internal Award List

PROGRAM : B.TECH-(COMPUTER SCIENCE)

MAX. MARKS : 40.00

SEMESTER : sixth

SESSION : 2024-25

COURSE : Mobile communication

COURSE CODE : ECS612

SL. NO.	ENROLLMENT NO.	STUDENT'S NAME	ASSESSMENT BASES					TOTAL OBTAINED MARKS	
			CT1	CT2	CT3	ASN	ATT	IN FIGURE	IN WORDS

MARKS			10.00	10.00	10.00	10.00	10.00	40.00	FOURTY
1	TCA2209001	AADI JAIN	8	10.0					
2	TCA2209002	AADITYA JAIN	AB	7.3					
3	TCA2209006	ABHAY KUMAR	9.666667	9.3					
4	TCA2209007	ABHIJEET SHARMA	10	AB					
5	TCA2209009	ADEESH JAIN	8.666667	AB					
6	TCA2209010	ADITI JAIN	10	10.0					
7	TCA2209011	ADITYA ANISH JAIN	AB	8.0					
8	TCA2209014	ADITYA WAGHE	AB	10.0					
9	TCA2209015	AGAM JAIN	10	10.0					
10	TCA2209018	AKHIL CHAUHAN	AB	8.0					
11	TCA2209020	AMAN CHAUHAN	9	8.0					
12	TCA2209023	AMAN KUMAR	8.666667	8.3					
13	TCA2209028	ANEKANT JAIN	9.333333	AB					
14	TCA2209032	ANSH KUMAR VASHISHTHA	AB	8.7					
15	TCA2209036	ARJIT PHOGAT	6.333333	6.7					
16	TCA2209039	ARPITA SRIVASTAVA	9	6.7					
17	TCA2209041	ARYAN JAIN	8.666667	5.0					
18	TCA2209047	BHANU PRATAP SINGH	10	AB					
19	TCA2209048	BHARTI SHARMA	8.333333	AB					
20	TCA2209051	BHUMIKA JAIN	10	AB					
21	TCA2209052	DAKSH JAIN	10	9.3					

22	TCA2209058	DEEYA JAIN	7.333333	8.0					
23	TCA2209059	DEVANSH BHARADWAJ	10	9.3					
24	TCA2209062	DIVYANSH JAIN	9.333333	9.0					
25	TCA2209063	DRASHTI JAIN	10	9.7					
26	TCA2209065	HAMZA FARHAT	9.666667	AB					
27	TCA2209069	HARSHIT KUMAR	AB	8.0					
28	TCA2209070	HEMANT JAIN	8	9.7					
29	TCA2209071	HEMANT PANDEY	10	8.3					
30	TCA2209075	JAIN AMAN AJAY	8.666667	9.0					
31	TCA2209076	JANVI CHAUHAN	8	7.7					
32	TCA2209079	KASHISH JAIN	9.666667	9.3					
33	TCA2209080	KASHISH RASTOGI	9.666667	9.7					
34	TCA2209085	LAKI SAINI	9.666667	9.0					
35	TCA2209088	MANSI CHOUDHARY	0	7.0					
36	TCA2209107	NITISHA JAIN	9.666667	AB					
37	TCA2209109	NAMAN JAIN	9.666667	9.7					
38	TCA2209112	NIKHIL JAIN	AB	7.3					
39	TCA2209115	NISHANT CHAUHAN	AB	6.0					
40	TCA2209120	PAYAL JAIN	9.333333	9.7					
41	TCA2209122	PRAKASH RAJ	9	3.3					
42	TCA2209126	PRASHANT PATEL	9.666667	AB					
43	TCA2209133	RAHUL KUMAR	9.666667	6.7					
44	TCA2209140	RAVIKANT SHARMA	9	9.7					

45	TCA2209146	RITIK KUMAR	9.333333	9.0					
46	TCA2209147	RIYA JAIN	AB	6.3					
47	TCA2209149	ROHAN KANCHAN SAXENA	AB	4.0					
48	TCA2209155	SAMARTH SAXENA	9.666667	7.7					
49	TCA2209173	SHREYANSH JAIN	5.666667	4.3					
50	TCA2209175	SUBRAT JAIN	10	10.0					
51	TCA2209180	TANISHKA JAIN	9.333333	9.7					
52	TCA2209181	TANVI JAIN	8.666667	7.7					
53	TCA2209184	UDAY JAIN	6	9.0					
54	TCA2209185	UDIT JAIN	6.666667	AB					
55	TCA2209187	VANSHIKA TRIPATHI	9.666667	9.7					
56	TCA2209193	YAMINI JAIN	10	9.7					
57	TCA2209194	YUVRAJ SINGH	10	8.7					
58	TCA2209204	LAXMI	7.666667	AB					
59	TCA2209094	MOHD GUL SHEEMAB	9.666667	9.7					
60	TCA2209102	MOHD SANIB	10	7.7					

PROGRAM : B.TECH-COMPUTER SCIENCE
(LATERAL)

MAX. MARKS : 40.00

SEMESTER : SEVENTH SEMESTER

SESSION : 2024-25

COURSE : Mobile Communication

COURSE CODE : ECS612

SL. NO.	ENROLLMENT NO.	STUDENT'S NAME	ASSESSMENT BASES					TOTAL OBTAINED MARKS	
			CT1	CT2	CT3	ASN	ATT	IN FIGURE	IN WORDS
MARKS			10.00	10.00	10.00	10.00	10.00	40.00	FOURTY
1	TCA2311002	ANKUR JAIN	9.6	9					
2	TCA2311003	AYAZ ARIF KHAN	AB	AB					
3	TCA2311004	AYUSHI BHATNAGAR	8.6	7					
4	TCA2311005	BHANU PRATAP	8	AB					
5	TCA2311007	RAJ PRATAP	AB	6.7					
6	TCA2311008	YOGESH VERMA	9	7					

Identification of Slow Learners after CT1

1	TCA2311007	RAJ PRATAP	AB
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Identification of Slow Learners after CT2

1.	TCA2209039	ARPITA SRIVASTAVA	5.0
2.	TCA2209102	MOHD SANIB	6.0
3.	TCA2209112	NIKHIL JAIN	3.3
4.	TCA2209126	PRASHANT PATEL	6.3
5.	TCA2209133	RAHUL KUMAR	4.0

Special classes with attendance sheet of slow learners with ATR after CT-I

- Topics have been identified for slow learners after CT-1 as given below
 - Production System
 - Heuristic Search Techniques
- After special/remedial classes circular, classes had been taken as per below attendance sheet

Attendance Sheet

Classes for Slow Learners After First CT			Date/Month			
S.NO.	Enrollment No.	Name	15/02	16/02	18/02	19/02
1	TCA2311007	RAJ PRATAP	P	P	P	P

Special classes with attendance sheet of slow learners with ATR after CT-II

- Topics have been identified for slow learners after CT-2 as given below
 - Propositional Logic
 - Slot and Filler
 - Semantic Net
- After special/remedial classes circular, classes had been taken as per below attendance sheet

Classes for Slow Learners After Second CT			Date/Month			
S.NO.	Enrollment No.	Name	21/03	23/03	28/03	30/03

1.	TCA2209039	ARPITA SRIVASTAVA	P	P	P	P
2.	TCA2209102	MOHD SANIB	P	P	P	P
3.	TCA2209112	NIKHIL JAIN	P	P	P	P
4.	TCA2209126	PRASHANT PATEL	P		P	P
5.	TCA2209133	RAHUL KUMAR	P	P	P	P



Faculty of Engineering

Assignment -1

Program Name: B. Tech. (CSE)

Year: 3rd	Semester: VI	Academic Session: 2024-25
Course Code: ECS-612	Course Name: Mobile Communication	
		Max. Marks: 20

*Bloom Level {1-Remembering, 2-Understanding, 3-Applying, 4-Analyzing, 5-Evaluating, 6-Creating}

Attempt all questions.

		MM	Unit	BTL	CO
1	Define Mobile computing and issues in mobile computing.	4	1	2	1
2	Explain Electromagnetic spectrum frequency ranges.	4	1	1	1
3	Explain Multiple access techniques and its types (FDMA ,TDMA and CDMA)	4	1	2	1
4	Explain cellular system and proper and improper hands off in wireless communication.	4	1	2	1
5	Design a cluster for N =7 and draw the frequency reuse pattern and distance formula. Also explain cell capacity.	4	1	3	1



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Assignment -2

Program Name: B. Tech. (CSE)

Year: 3rd	Semester: VI		Academic Session: 2024-25
Course Code: ECS612	Course Name: Mobile communication		
			Max. Marks: 20

*Bloom Level {1-Remembering, 2-Understanding, 3-Applying, 4-Analyzing, 5-Evaluating, 6-Creating}

Attempt all questions.

		MM	Unit	BTL	CO
1	What is GSM?	2	2	1	2
2	What is GPRS?	2	2	1	2
3	Differences between GSM and GPRS.	2	2	2	2
4	Explain how GSM facilitates mobile voice communication.	2	2	3	2
5	How GPRS is utilized for mobile internet services.	2	2	3	2
6	Explain the advantages and limitations of GSM vs. GPRS in mobile networks.	5	2	4	2
7	Explain working of SGSN and GGSN	5	2	3	2



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Assignment -3

Program Name: B. Tech. (CSE)

Year: 3rd	Semester: VI	Academic Session: 2024-25
Course Code: ECS-612	Course Name:	
		Max. Marks: 20

*Bloom Level {1-Remembering, 2-Understanding, 3-Applying, 4-Analyzing, 5-Evaluating, 6-Creating}

Attempt all questions.

		MM	Unit	BTL	CO
1	Define the following terms: - WLAN - WAP - Mobile IP - WML - IEEE 802.11	2	3	1	3
2	List the advantages and disadvantages of WLAN in mobile communication	2	3	1	3
3	Describe the working of Mobile IP and its role in mobile communication	2	3	2	3
4	Develop a simple WML script to display a mobile webpage	2	3	3	3

	with a menu				
5	Compare WLAN and WAP in terms of their functions and usability in mobile communication.	2	3	4	3
6	Differentiate between IEEE 802.11a, IEEE 802.11b, and IEEE 802.11g in terms of speed, frequency, and applications.	5	3	3	3
7	Evaluate the impact of Mobile IP on seamless roaming in cellular networks	5	3	5	3



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Assignment -4

Program Name: B. Tech. (CSE)

Year: 3rd	Semester: IV	Academic Session: 2024-25
Course Code: ECS612	Course Name: Mobile communication	
		Max. Marks: 20

*Bloom Level {1-Remembering, 2-Understanding, 3-Applying, 4-Analyzing, 5-Evaluating, 6-Creating}

Attempt all questions.

		MM	Unit	BTL	CO
1	Define the following terms: • IMT-2000 • WCDMA • CDMA2000	2	4	1	4
2	List the key features of 3G mobile services.	2	4	1	4
3	Explain how IMT-2000 standardizes global mobile communication.	2	4	2	4
4	Describe the role of WCDMA in 3G mobile networks.	4	4	2	4
5	Demonstrate how IMT-2000 enables seamless international roaming.	5	4	3	4

6	Differentiate between IMT-2000 and earlier mobile communication standards in terms of capabilities and architecture.	5	4	4	4
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Faculty of Engineering

Assignment -5

Program Name: B. Tech. (CSE)

Year: 3rd	Semester: IV	Academic Session: 2024-25
Course Code: ECS612	Course Name: Mobile communication	
		Max. Marks: 20

*Bloom Level {1-Remembering, 2-Understanding, 3-Applying, 4-Analyzing, 5-Evaluating, 6-Creating}

Attempt all questions.

		MM	Unit	BTL	CO
1	List the primary applications of GPS and WiMAX.	2	5	1	5
2	Define the following terms: • WLL (Wireless Local Loop) • GPS (Global Positioning System) • Iridium • Globalstar • Bluetooth • WiMAX	2	5	1	5
3	Explain how GPS works and its significance in modern communication.	2	5	2	5
4	Describe the differences between Iridium and Globalstar satellite communication systems.	4	5	2	5

5	Provide a real-world scenario where WLL is more effective than wired communication.	5	5	3	5
6	Compare Bluetooth and WiMAX in terms of range, data rate, and applications.	5	5	4	5

Attendance Sheet (Month-wise)

Attendance for the month of Feb 2025

		Day	10	11	12	14	17	18	24	25
		Month	Feb	Feb	Feb	Feb	Feb	Feb	Feb	Feb
Sl.	Enrollment No.	Student Name								
1	TCA2209001	AADI JAIN	P	P	P	P	P		P	P
2	TCA2209002	AADITYA JAIN	P	P		P	P	P	P	P
3	TCA2209006	ABHAY KUMAR	P	P	P	P	P	P	P	P
4	TCA2209007	ABHIJEET SHARMA	P		P	P	P	P	P	P
5	TCA2209009	ADEESH JAIN	P	P	P	P	P	P	P	P
6	TCA2209010	ADITI JAIN		P	P	P	P	P	P	P
7	TCA2209011	ADITYA ANISH JAIN	P	P		P	P	P	P	P
8	TCA2209014	ADITYA WAGHE	P	P	P	P	P	P		P
9	TCA2209015	AGAM JAIN	P	P	P	P	P	P	P	P
10	TCA2209018	AKHIL CHAUHAN	P	P	P	P	P	P	P	P
11	TCA2209020	AMAN CHAUHAN	P	P	P	P	P	P	P	P
12	TCA2209023	AMAN KUMAR	P	P	P	P	P	P	P	
13	TCA2209028	ANEKANT JAIN	P	P	P	P	P	P		P
14	TCA2209032	ANSH KUMAR VASHISHTHA	P	P	P	P		P	P	P
15	TCA2209036	ARJIT PHOGAT	P	P		P	P	P	P	P

42	TCA2209126	PRASHANT PATEL	P	P	P	P	P	P	P	P
43	TCA2209133	RAHUL KUMAR	P	P	P	P	P	P	P	
44	TCA2209140	RAVIKANT SHARMA	P	P	P	P	P	P	P	P
45	TCA2209146	RITIK KUMAR	P	P	P	P	P	P	P	P
46	TCA2209147	RIYA JAIN	P	P	P	P	P	P	P	P
47	TCA2209149	ROHAN KANCHAN SAXENA	P	P	P	P	P	P	P	P
48	TCA2209155	SAMARTH SAXENA	P	P	P	P	P	P	P	
49	TCA2209173	SHREYANSH JAIN	P	P	P	P	P	P	P	P
50	TCA2209175	SUBRAT JAIN	P	P	P	P	P	P	P	P
51	TCA2209180	TANISHKA JAIN	P	P	P	P	P	P	P	P
52	TCA2209181	TANVI JAIN	P	P	P	P	P	P	P	P
53	TCA2209184	UDAY JAIN	P	P	P	P	P	P	P	
54	TCA2209185	UDIT JAIN	P	P	P	P	P	P	P	P
55	TCA2209187	VANSHIKA TRIPATHI	P	P	P	P	P	P	P	P
56	TCA2209193	YAMINI JAIN	P	P	P	P	P	P	P	P
57	TCA2209194	YUVRAJ SINGH	P	P	P	P	P	P	P	P
58	TCA2209204	LAXMI	P	P	P	P	P	P	P	
59	TCA2209094	MOHD GUL SHEEMAB	P	P	P	P	P	P	P	P
60	TCA2209102	MOHD SANIB	P	P	P	P	P	P	P	P
61	TCA2311002	ANKUR JAIN	P	P	P	P	P	P	P	P
62	TCA2311003	AYAZ ARIF KHAN	P	P	P	P	P	P	P	
63	TCA2311004	AYUSHI BHATNAGAR	P	P	P	P	P	P	P	P
64	TCA2311005	BHANU PRATAP	P	P	P	P	P	P	P	P
65	TCA2311007	RAJ PRATAP	P	P	P	P	P	P	P	P
66	TCA2311008	YOGESH VERMA	P	P	P	P	P	P	P	P

Attendance for the month of March 2025

		Day	1	7	8	14	15	16	18	19	21	23	25
		Month	March	March	March	March	March	March	March	Mar	Mar	Mar	Mar
Sl.	Enrollment No.	Student Name											
1	TCA2209001	AADI JAIN	P	P	P	P	P	P	P	P	P	P	P
2	TCA2209002	AADITYA JAIN	P	P		P	P	P	P	P	P	P	P
3	TCA2209006	ABHAY KUMAR	P	P	P	P	P	P	P	P	P	P	P
4	TCA2209007	ABHIJEET SHARMA	P		P	P	P		P	P	P	P	P
5	TCA2209009	ADEESH JAIN	P	P	P	P	P	P	P	P	P	P	P
6	TCA2209010	ADITI JAIN	P	P	P	P	P	P	P	P	P	P	P
7	TCA2209011	ADITYA ANISH JAIN	P	P	P	P	P	P	P	P	P	P	P
8	TCA2209014	ADITYA WAGHE	P	P	P	P	P	P		P	P	P	P
9	TCA2209015	AGAM JAIN	P	P	P	P	P	P	P	P	P		P
10	TCA2209018	AKHIL CHAUHAN	P	P		P	P	P	P	P	P	P	P
11	TCA2209020	AMAN CHAUHAN	P	P	P	P	P	P	P	P	P		P
12	TCA2209023	AMAN KUMAR		P	P	P	P	P	P		P	P	P
13	TCA2209028	ANEKANT JAIN	P	P	P	P	P	P		P	P	P	P
14	TCA2209032	ANSH KUMAR VASHISHTHA	P	P	P	P		P	P	P	P	P	P
15	TCA2209036	ARJIT PHOGAT	P	P		P	P	P	P	P	P	P	P

16	TCA2209039	ARPITA SRIVASTAVA	P		P	P	P	P	P	P	P	P	P	P
17	TCA2209041	ARYAN JAIN		P	P	P	P	P	P	P	P	P	P	P
18	TCA2209047	BHANU PRATAP SINGH	P		P	P	P	P	P	P	P	P	P	P
19	TCA2209048	BHARTI SHARMA	P	P		P	P	P	P	P	P	P	P	P
20	TCA2209051	BHUMIKA JAIN	P	P	P	P		P	P	P	P	P	P	P
21	TCA2209052	DAKSH JAIN	P	P	P	P	P	P		P	P	P	P	P
22	TCA2209058	DEEYA JAIN	P	P	P	P	P	P	P	P		P	P	P
23	TCA2209059	DEVANSH BHARADWAJ	P	P	P	P	P	P	P	P	P	P	P	P
24	TCA2209062	DIVYANSH JAIN	P	P	P	P	P	P	P	P	P	P	P	
25	TCA2209063	DRASHTI JAIN	P	P	P	P	P	P	P	P		P	P	P
26	TCA2209065	HAMZA FARHAT	P	P	P	P	P	P		P	P	P	P	P
27	TCA2209069	HARSHIT KUMAR	P	P	P	P		P	P	P	P	P	P	P
28	TCA2209070	HEMANT JAIN	P	P		P	P	P	P	P	P	P	P	P
29	TCA2209071	HEMANT PANDEY		P	P	P	P	P	P	P	P	P	P	P
30	TCA2209075	JAIN AMAN AJAY	P	P	P	P		P	P	P	P	P	P	P
31	TCA2209076	JANVI CHAUHAN	P	P	P	P	P	P		P	P	P	P	P
32	TCA2209079	KASHISH JAIN	P	P	P	P	P	P	P	P		P	P	P
33	TCA2209080	KASHISH RASTOGI	P	P	P	P	P	P	P	P	P	P	P	
34	TCA2209085	LAKI SAINI	P	P	P	P	P	P	P	P	P	P	P	P
35	TCA2209088	MANSI CHOUDHARY	P	P	P	P	P	P	P	P	P	P	P	P
36	TCA2209107	NITISHA JAIN	P	P	P	P	P	P	P	P		P	P	P
37	TCA2209109	NAMAN JAIN	P	P	P	P	P	P	P	P	P	P	P	
38	TCA2209112	NIKHIL JAIN	P	P	P	P	P	P	P	P	P	P	P	P
39	TCA2209115	NISHANT CHAUHAN	P	P	P	P	P	P	P	P	P	P	P	P
40	TCA2209120	PAYAL JAIN	P	P	P	P	P	P	P	P		P	P	P

[illegible]

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Attendance for the month of MAY 2025

		Day	1	2	4	6	10	21	23	25	27	28	30
		Month	May	May	May	May	May						
Sl.	Enrollment No.	Student Name											
1	TCA2209001	AADI JAIN	P	P	P	P	P						
2	TCA2209002	AADITYA JAIN	P	P	P	P							
3	TCA2209006	ABHAY KUMAR	P	P	P	P	P						
4	TCA2209007	ABHIJEET SHARMA	P		P	P	P						
5	TCA2209009	ADEESH JAIN	P	P	P	P	P						
6	TCA2209010	ADITI JAIN		P	P	P	P						
7	TCA2209011	ADITYA ANISH JAIN	P	P		P	P						
8	TCA2209014	ADITYA WAGHE	P	P	P	P	P						
9	TCA2209015	AGAM JAIN	P	P	P	P	P						
10	TCA2209018	AKHIL CHAUHAN	P	P	P	P	P						
11	TCA2209020	AMAN CHAUHAN	P	P	P	P	P						
12	TCA2209023	AMAN KUMAR	P	P	P	P	P						
13	TCA2209028	ANEKANT JAIN	P	P	P	P	P						
14	TCA2209032	ANSH KUMAR VASHISHTHA	P	P	P	P							
15	TCA2209036	ARJIT PHOGAT	P	P		P	P						
16	TCA2209039	ARPITA SRIVASTAVA	P		P	P	P						
17	TCA2209041	ARYAN JAIN		P	P	P	P						
18	TCA2209047	BHANU PRATAP SINGH	P	P	P	P	P						
19	TCA2209048	BHARTI SHARMA	P	P		P	P						
20	TCA2209051	BHUMIKA JAIN	P	P	P	P							
21	TCA2209052	DAKSH JAIN	P	P	P	P	P						

22	TCA2209058	DEEYA JAIN	P	P	P	P	P						
23	TCA2209059	DEVANSH BHARADWAJ	P	P	P	P	P						
24	TCA2209062	DIVYANSH JAIN	P	P	P	P	P						
25	TCA2209063	DRASHTI JAIN	P	P	P	P	P						
26	TCA2209065	HAMZA FARHAT	P	P	P	P	P						
27	TCA2209069	HARSHIT KUMAR	P	P	P	P							
28	TCA2209070	HEMANT JAIN	P	P		P	P						
29	TCA2209071	HEMANT PANDEY	P	P	P	P	P						
30	TCA2209075	JAIN AMAN AJAY	P	P	P	P							
31	TCA2209076	JANVI CHAUHAN	P	P	P	P	P						
32	TCA2209079	KASHISH JAIN	P	P	P	P	P						
33	TCA2209080	KASHISH RASTOGI		P	P	P	P						
34	TCA2209085	LAKI SAINI	P	P	P	P	P						
35	TCA2209088	MANSI CHOUDHARY	P	P	P	P	P						
36	TCA2209107	NITISHA JAIN	P	P	P	P	P						
37	TCA2209109	NAMAN JAIN	P	P	P	P	P						
38	TCA2209112	NIKHIL JAIN	P	P	P	P	P						
39	TCA2209115	NISHANT CHAUHAN	P	P	P	P	P						
40	TCA2209120	PAYAL JAIN	P	P	P	P	P						
41	TCA2209122	PRAKASH RAJ	P	P	P	P	P						
42	TCA2209126	PRASHANT PATEL	P	P	P	P	P						
43	TCA2209133	RAHUL KUMAR	P	P	P	P	P						
44	TCA2209140	RAVIKANT SHARMA	P	P	P	P	P						
45	TCA2209146	RITIK KUMAR	P	P	P	P	P						
46	TCA2209147	RIYA JAIN	P	P	P	P							
47	TCA2209149	ROHAN KANCHAN SAXENA	P	P		P	P						

48	TCA2209155	SAMARTH SAXENA	P	P	P	P	P						
49	TCA2209173	SHREYANSH JAIN	P	P	P	P							
50	TCA2209175	SUBRAT JAIN	P	P	P	P	P						
51	TCA2209180	TANISHKA JAIN	P	P	P	P	P						
52	TCA2209181	TANVI JAIN		P	P	P	P						
53	TCA2209184	UDAY JAIN	P	P	P	P	P						
54	TCA2209185	UDIT JAIN	P	P	P	P	P						
55	TCA2209187	VANSHIKA TRIPATHI	P	P	P	P	P						
56	TCA2209193	YAMINI JAIN	P	P	P	P	P						
57	TCA2209194	YUVRAJ SINGH	P	P	P	P	P						
58	TCA2209204	LAXMI	P	P	P	P	P						
59	TCA2209094	MOHD GUL SHEEMAB	P	P	P	P	P						
60	TCA2209102	MOHD SANIB	P	P	P	P	P						
61	TCA2311002	ANKUR JAIN	P	P	P	P	P						
62	TCA2311003	AYAZ ARIF KHAN	P	P	P	P	P						
63	TCA2311004	AYUSHI BHATNAGAR	P	P	P	P	P						
64	TCA2311005	BHANU PRATAP	P	P	P	P	P						
65	TCA2311007	RAJ PRATAP	P	P	P	P	P						
66	TCA2311008	YOGESH VERMA	P	P	P	P	P						

