Programme Code: **JTM**

Master of Technology in Telecommunication Technology and Management

Interdisciplinary Programme

The overall credits structure

Category	PC	PE	OE	Total
Credits	37	15	6	58

Program Core

ELL7400	Signal Theory	3-0-0	3
ELL7401	Digital Communications	3-0-0	3
BSP7010	Communication and Signal Processing Technologies	0-1-4	3
MSL7023	Telecommunication Systems Management	3-0-0	3
OR			
ELL7450	Machine Learning for Wireless Communications	3-0-2	4
JTD7095	Cornerstone Project	0-0-6	3
JTD7096	Minor project/ Internship	0-0-6	3
BSV7090	Ethical Considerations in Telecommunication Technologies and Management	1-0-0	1
JTD 7097	Major Project Part-I	0-0-12	6
JTD 7098	Major Project Part-II	0-0-24	12
	Research/Teaching Practicum	(0-0-8)	

Program Electives

Streamed Electives (JTM) in (Information Processing and Machine Learning)

ELL7402	Detection and Estimation Theory	3-0-0	3
ELL7006	Optimization for Electrical Engineers	3-0-0	3
ELL7009	Online Learning	3-0-0	3
CRL7007	Human & Machine Speech Communication	3-0-0	3
ELL7407	Digital Image Processing	3-0-0	3
ELL7410	Statistical Signal Processing	3-0-0	3
ELL7420	Advanced Digital Signal Processing	3-0-0	3
ELL7412	Multichannel Signal Processing	3-0-0	3
ELL7029	Stochastic Control and Reinforcement Learning	3-0-0	3
ELL7286/ COL 7341	Introduction to Machine Learning Fundamentals of Machine Learning	3-0-0	3
ELL7086	Multimedia Systems	3-0-0	3
COL7370	Advanced Artificial Intelligence	3-0-2	4
COL7376	Learning Probabilistic Graphical Models	3-0-2	4
COL7364	Information Retrieval and Web Search	3-0-2	4
AIL 7041	Querying and Mining Graph Data (Proposed)	3-0-2	4
AIL 7042	Scalable Data Handling for ML (Proposed)	3-0-2	4
ELL7091	Neural Systems and Learning Machines	3-0-2	4
ELL7095	Swarm Intelligence	3-0-0	3
ELL8082	Large-Scale Machine Learning	3-0-0	3
ELL8088	Advanced Machine Learning	3-0-0	3
AIL 7023	Graph Machine Learning	3-0-2	4
ELL 7404	Computer Vision	3-0-0	3
ELL 8084	Deep Learning for Natural Language Processing	3-0-0	3
COL 7378	Principles of Autonomous Systems	3-0-2	4
AIL 7022	Reinforcement Learning	3-0-0	3
AIL 7021	Deep Learning	3-0-2	4
ELL 8023	Selected Topics in Signal Processing*	3-0-0	3
BSL 8000	Quantum Information Processing and Machine Learning	3-0-2	4
ELL7411	Wireless Communications	3-0-0	3
ELL 7403	Computer Communication Networks	3-0-4	5
BSL8006	Quantum Information Theory	3-0-0	3

Streamed Electives (JTM) in (Communication Systems and Networks)

ELL7411 or ELL 7403	Wireless Communications or Computer Communication Networks	3-0-0 or 3-0-4	3 or 5
ELL7450	Machine Learning for Wireless Communications		
COL 7524	Advanced Computer Networks	3-0-2	4

ELL 7006	Optimization for Electrical Engineers	3-0-0	3
ELL 7406	Coding Theory	3-0-0	3
ELL 7014	Basic Information Theory	3-0-0	3
ELL 7427	Telecommunication Switching and Transmission	3-0-0	3
ELL 7017	Optical Communication Systems	3-0-0	3
ELL 7410	Statistical Signal Processing	3-0-0	3
ELL 7402	Detection and Estimation Theory	3-0-0	3
ELL 7420	Advanced Digital Signal Processing	3-0-0	3
ELL7430	Broadband Communication Systems	3-0-0	3
ELL7029	Stochastic Control and Reinforcement Learning	3-0-0	3
ELL8013	Advanced Information Theory	3-0-0	3
ELL8014	Wireless Optical Communications	3-0-0	3
ELL7432	MIMO Wireless Communications	3-0-0	3
ELL7433	Satellite Communication	3-0-0	3
ELL8017	Access Networks	3-0-0	3
ELL8018	Telecommunication Technologies	3-0-0	3
ELL8020	Photonic Switching and Networking	3-0-0	3
ELL8024	Selected Topics in Information Processing-II	3-0-0	3
ELL8094	Network Performance Modeling and analysis	3-0-0	3
ELL 7408	Network Security	3-0-0	3
ELL 8296	Mobile Computing	3-0-0	3
ELL 7431	Cyber Security and Information Assurance	3-0-0	3
ELV 7010	Special Module in Cyber Security	1-0-0	1
ELP 7411	Wireless Communication Laboratory	0-1-4	3
BSL7005	Introduction to Communication and Cryptogtaphy	3-0-0	3

Streamed Electives (JTM) in (Embedded Systems)

ELL7087	Embedded Systems and Applications	3-0-0	3
COL 7418	Architecture of High Performance Computers	3-0-2	4
COL 7419	Synthesis of Digital Systems	3-0-2	4
ELL 7066	Appliance Systems	3-0-0	3
COL7488	Advanced Topics in Embedded Computing	3-0-0	3
ELL 7090	Digital Hardware Design	3-0-0	3
ELL 8887	Cloud Computing	3-0-0	3
ELL 8098	Pervasive Computing	3-0-0	3
ELL 8099	Testing and Fault Tolerance	3-0-0	3
ELP 7021	Embedded Telecommunication Systems Laboratory	0-1-4	3
ELP 7081	Digital Systems Lab	0-1-4	3
COL 8412	System Level Design and Modelling	3-0-0	3
COL 8418	Principles of Multiprocessor Systems	3-0-2	4

Streamed Electives (JTM) in (Telecom Management)

MSL 7060	Marketing Management	2-0-2	3
MSL7000	Fundamentals of Management of Technology	3-0-0	3
MSL7001	Strategic Technology Management	3-0-0	3
MSL7007	Management Accounting	3-0-0	3
MSL7013	Information Systems Management	3-0-0	3
MSL7026	Telecom Systems Analysis, Planning and Design	3-0-0	3
MSL7028	International Telecommunication Management	3-0-0	3
MSL 8014	Data Visualization	1.5-0-0	1.5
MSL8015	Decision Support and Expert Systems	2-0-2	3
MSL8050	Management of Information Technology	3-0-0	3
MSL8078	Electronic Payments	1.5-0-0	1.5
MSL8083	ICTs Development and Business	1.5-0-0	1.5
MSL8086	IT Consulting and Practice	3-0-0	3
MSL8088	Data Warehousing for Business Decisions	1.5-0-0	1.5
MSL8093	Public Policy Issues in the Information Age	1.5-0-0	1.5
MSL8094	Social Media and Business Practices	3-0-0	3

1. Nominal Semester-wise Academic Plan (JTM) 2-year Programme

Sem.	Course 1	Course 2	Course 3	Course 4	Course 5	L	T	P	Credits	Non-graded	Contact hours
I	ELL7011 Signal Theory (3-0-0) 3	ELL7012 Digital Communication (3-0-0) 3	BSP7010 Communication & Signal Processing Technologies (0-1-4) 3	PE1 (3-0-0) 3	Research/Teaching Practicum (0-0-8)	9	1	4	12		14
JTD7095 Cornerstone project (winter)											
II	MSL7023 Telecommunication Systems Management (3-0-0) 3	OE1 (3-0-0) 3	ELL70xx Machine Learning for Wireless Communications (3-0-2) 4	JTD7095 Cornerstone project (0-0-6) 3	Research/Teaching Practicum (0-0-8)	9	0	8	13		17
JTD7096 Summer Internship/Minor Project (0-0-6) 3						0	0	6	3		6
III	JTD7097 Major Project Part - 1 (JTM) (0-0-12) 6	PE2 (3-0-0) 3	PE3 (3-0-0) 3	PE4 (3-0-0) 3	Research/Teaching Practicum (0-0-8)	9	0	12	15		21
IV	JTD7098 Major Project Part - 2 (JTM) (0-0-24) 12	OE2 (3-0-0) 3		BSV7090 Ethical Considerations in Telecommunication Technologies and Management (1-0-0) 1	Research/Teaching Practicum (0-0-8)	4	0	24	16		28

Semester-wise Academic Plan for JTM (HVA) 3-year programme

Sem.	Course 1	Course 2	Course 3	Course 4	L	T	P	Credits	Non-graded Units	Contact hours
I	ELL7011 Signal Theory (3-0-0) 3	ELL7012 Digital Communication (3-0-0) 3	BSP7010 Communication & Signal Processing Technologies (0-1-4) 3	Research/Teaching Practicum (0-0-8)	6	1	4	9		11
II	MSL7023 Telecommunication Systems Management (3-0-0) 3	OE1 (3-0-0) 3	ELL70xx Machine Learning for Wireless Communications (3-0-2) 4	Research/Teaching Practicum (0-0-8)	9	0	2	10		11
JTD7096 Summer Internship/Minor Project (0-0-6) 3					0	0	6	3		6
III	PE1 (3-0-0) 3	OE2 (3-0-0) 3	PE2 (3-0-0) 3	Research/Teaching Practicum (0-0-8)	9	0	0	9		9
JTD7095 Cornerstone project (winter)										
IV	PE3 (3-0-0) 3	PE4 (3-0-0) 3	JTD7095 Cornerstone project (0-0-6) 3	Research/Teaching Practicum (0-0-8)	6	0	6	9		12
V	JTD7097 Major Project Part - 1 (JTM) (0-0-12) 6			Research/Teaching Practicum (0-0-8)	0	0	12	6		12

VI	JTD7098 Major Project Part - 2 (JTM) (0-0-24) 12		BSV7090 Ethical Considerations in Telecommunication Technologies and Management (1-0-0) 1	Research/Teaching Practicum (0-0-8)	1	0	24	13		25