

## Master of Technology in Computer Technology

Department of Electrical Engineering

### Overall credit structure

Category	PC	PE	OC	Total
Credits	21	24/27 <sup>1</sup>	3/6 <sup>2</sup>	51

Sem	Courses					Lecture Courses	Contact hrs/week				Credits
							L	T	P	Total	
I	<b>[PC-1]</b> ELL780 Mathematical Foundations of Computer Technology (3-0-0)	<b>[PC-2]</b> ELL781 Software Fundamentals for Computer Technology (3-0-0)	<b>[PC-3]</b> ELL782 Computer Architecture (3-0-0)	<b>[PE-1]</b> ZZyxxx (3-0-0)	<b>[PE-2]</b> ZZyxxx (3-0-0)	5	15	0	0	15	15
II	<b>[PC-4]</b> ELL783 Operating Systems (3-0-2)	<b>[PC-5]</b> ELD780 Minor Project (0-0-4)	<b>[PE-3]</b> ZZyxxx (3-0-0)	<b>[PE-4]</b> ZZyxxx (3-0-0)		4	9	0	6	15	12
Summer: <b>[PC-6]</b> ELD880 Major Project Part 1 (for M.Tech with Dissertation)											
III (M.Tech with Dissertation)	<b>[PC-6]</b> ELD880 Major Project Part 1 (0-0-12)	<b>[PE-5]</b> ZZyxxx (3-0-0)	<b>[OE-1]</b> ZZyxxx (3-0-0)			2	6	0	12	18	12
III (M.Tech without Dissertation)	<b>[PE-5]</b> ZZyxxx (3-0-0)	<b>[PE-6]</b> ZZyxxx (3-0-0)	<b>[PE-7]/[OE-1]</b> ZZyxxx (3-0-0)	<b>[PE-8]/[OE-2]</b> ZZyxxx (3-0-0)		4	12	0	0	12	12

<sup>1</sup> Related to point 2, below:

<sup>2</sup> Those not opting for the Dissertation can do a maximum of 6 OC credits; those opting for the Dissertation can do a maximum of 3 OC credits.

IV (M.Tech with Disserta tion)	<b>[PE-6]</b> ELD881 Major Project Part 2 (0-0-24)					0	0	0	24	24	12
IV (M.Tech without Disserta tion)	<b>[PC-6]</b> ELD880 Major Project Part 1 (0-0-12)	<b>[PE-7][OE-1]</b> ZZyxxx (3-0-0)	<b>[PE-8][OE-2]</b> ZZyxxx (3-0-0)			2	6	0	12	18	12

### Notes:

- The example above considers only lecture courses (ZZLxxx). The total number of credits for Semesters II, III, and IV can be composed of other 3-credit laboratory courses (ZZPxxx) as well, as mentioned in the baskets below. If the course is that of the Department of Electrical Engineering, ZZ would be EL, for instance.
- There are three types of courses: Programme Core (PC), Programme Elective (PE), Open Elective (OE). Any course in the list of Programme Cores is a PC, any course in the list of Programme Electives is a PE, and all other courses can be considered OEs.
- The Programme Electives (PEs) have been structured as follows. A student has to choose from one of the **five** possible streams in the programme: Cognitive and Intelligent Systems (CIS), Embedded Intelligent Systems (EIS), Computer Communication and Networks (CCN), Multimedia Information Processing (MIP), and Internet Technologies (IT). The PEs that must be taken corresponding to a particular stream are listed in the table below. To emphasise this fact, these courses are written in **italicised bold-face** as the first two courses of each stream, in the list of PEs associated with the particular streams. The remaining PEs should preferably be taken from within the PE list specified for the student's chosen stream.

Stream	Course Numbers and Titles	
<b>CIS</b>	ELL784: Introduction to Machine Learning	ELL786: Multimedia Systems
<b>EIS</b>	ELL784: Introduction to Machine Learning	ELL787: Embedded Systems and Applications
<b>CCN</b>	ELL785: Computer Communication Networks	ELL786: Multimedia Systems
<b>MIP</b>	ELL786: Multimedia Systems	ELL787: Embedded Systems and Applications
<b>IT</b>	ELL784: Introduction to Machine Learning	ELL785: Computer Communication Networks

- A Programme Elective (PE) can be taken in place of an Open Elective (OE)

- Students registering for Program Elective ELD881 Major Project Part 2, will have printed on their transcript, 'M.Tech with Dissertation'.
- Courses mentioned in red colour: from other groups/Departments

### Programme Core (PC)

Course#	Title	L-T-P	Credits
ELL780	Mathematical Foundations of Computer Technology	3-0-0	3
ELL781	Software Fundamentals for Computer Technology	3-0-0	3
ELL782	Computer Architecture	3-0-0	3
ELL783	Operating Systems	3-0-2	4
ELD780	Minor Project	0-0-4	2
ELD880	Major Project Part 1	0-0-12	6

### Programme Electives (PE): General

Course#	Title	L-T-P	Credits
ELD881	Major Project Part 2	0-0-24	12
ELL880	Special Topics in Computers 1	3-0-0	3
ELL881	Special Topics in Computers 2	3-0-0	3
ELV780	Special Module in Computers	1-0-0	1
ELS880	Independent Study	3-0-0	3

### Programme Electives (PE): Stream: Cognitive and Intelligent Systems (CIS)

Course#	Title	L-T-P	Credits
<b>ELL784</b>	<b>Introduction to Machine Learning</b>	<b>3-0-0</b>	<b>3</b>
<b>ELL786</b>	<b>Multimedia Systems</b>	<b>3-0-0</b>	<b>3</b>
ELL785	Computer Communication Networks	3-0-0	3
ELL787	Embedded Systems and Applications	3-0-0	3

ELL704	Advanced Robotics	3-0-0	3
ELL884	Information Retrieval	3-0-0	3
ELL789	Intelligent Systems	3-0-0	3
ELL882	Large-Scale Machine Learning	3-0-0	3
ELL799	Natural Computing	3-0-0	3
ELL796	Signals and Systems in Biology	3-0-0	3
ELL707	Systems Biology	3-0-0	3
ELL788	Computational Perception and Cognition	3-0-0	3
ELL891	Computational Linguistics	3-0-0	3
ELL886	Big Data Systems	3-0-0	3
ELL887	Cloud Computing	3-0-0	3
ELL741	Neuromorphic Engineering	3-0-0	3
ELL791	Neural Systems and Learning Machines	3-0-2	4
ELL888	Advanced Machine Learning	3-0-0	3
ELL793	Computer Vision	3-0-0	3
ELL715	Digital Image Processing	3-0-0	3
ELL798	Agent Technology	3-0-0	3
ELL795	Swarm Intelligence	3-0-0	3
ELL794	Human-Computer Interface	3-0-0	3
ELL893	Cyber-Physical Systems	3-0-0	3
ELL883	Embedded Intelligence	3-0-0	3
ELL885	Machine Learning for Computational Finance	3-0-0	3
ELL890	Computational Neuroscience	3-0-0	3

**Programme Electives (PE): Stream: Embedded Intelligent Systems (EIS)**

Course#	Title	L-T-P	Credits
<b>ELL784</b>	<b><i>Introduction to Machine Learning</i></b>	<b>3-0-0</b>	<b>3</b>
<b>ELL787</b>	<b><i>Embedded Systems and Applications</i></b>	<b>3-0-0</b>	<b>3</b>
ELL785	Computer Communication Networks	3-0-0	3
ELL786	Multimedia Systems	3-0-0	3
ELP780	Software Lab	0-1-4	3
ELP781	Digital Systems Lab	0-1-4	3
ELL704	Advanced Robotics	3-0-0	3
ELL735	Analog Integrated Circuits	3-0-0	3
ELL734	MOS VLSI	3-0-0	3
ELL748	System-on-Chip Design and Test	3-0-0	3
ELL731	Mixed Signal Circuit Design	3-0-0	3
COLxxx	Synthesis of Digital Systems	3-0-0	3
ELL790	Digital Hardware Design	3-0-0	3
ELL720	Digital Signal Processing 1	3-0-0	3
COLxxx	System Level Design and Modelling of Digital Systems	3-0-0	3
ELL899	Testing and Fault Tolerance	3-0-0	3
ELL802	Adaptive and Learning Control	3-0-0	3
ELL767	Mechatronics	3-0-0	3
ELL766	Appliance Systems	3-0-0	3
ELL898	Pervasive Computing	3-0-0	3
ELL887	Cloud Computing	3-0-0	3
ELL728	Optoelectronic Instrumentation	3-0-0	3
ELL883	Embedded Intelligence	3-0-0	3
ELL791	Neural Systems and Learning Machines	3-0-2	4
ELL797	Energy-Efficient Computing	3-0-0	3
ELL733	Digital ASIC Design	3-0-2	4

ELP831	IEC Laboratory-I	0-0-6	3
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**Programme Electives (PE): Stream: Computer Communication and Networks (CCN)**

Course#	Title	L-T-P	Credits
<b>ELL785</b>	<b>Computer Communication Networks</b>	<b>3-0-0</b>	<b>3</b>
<b>ELL786</b>	<b>Multimedia Systems</b>	<b>3-0-0</b>	<b>3</b>
ELL784	Introduction to Machine Learning	3-0-0	3
ELL787	Embedded Systems and Applications	3-0-0	3
ELP780	Software Lab	3-0-0	3
ELP782	Computer Networks Lab	0-1-4	3
ELP781	Digital Systems Lab	0-1-4	3
<b>ELL711</b>	<b>Signal Theory</b>	<b>3-0-0</b>	<b>3</b>
ELL894	Network Performance Modeling and Analysis	3-0-0	3
ELL889	Protocol Engineering	3-0-0	3
ELL892	Internet Technologies	3-0-0	3
ELL895	Network Security	3-0-0	3
ELL896	Mobile Computing	3-0-0	3
ELL897	Network Management	3-0-0	3
<b>ELL723</b>	<b>Broadband Communication Systems</b>	<b>3-0-0</b>	<b>3</b>
<b>ELL714</b>	<b>Basic Information Theory</b>	<b>3-0-0</b>	<b>3</b>
<b>ELL813</b>	<b>Advanced Information Theory</b>	<b>3-0-0</b>	<b>3</b>
<b>ELL716</b>	<b>Telecom Switching and Transmission</b>	<b>3-0-0</b>	<b>3</b>
<b>ELL710</b>	<b>Coding Theory</b>	<b>3-0-0</b>	<b>3</b>
<b>ELL712</b>	<b>Digital Communications</b>	<b>3-0-0</b>	<b>3</b>
<b>ELL816</b>	<b>Satellite Communication</b>	<b>3-0-0</b>	<b>3</b>
<b>ELL818</b>	<b>Telecom Technologies</b>	<b>3-0-0</b>	<b>3</b>

ELL817	Access Networks	3-0-0	3
ELL725	Wireless Communication	3-0-0	3
ELP725	Wireless Communication Lab	0-1-4	3
ELL717	Optical Communication Systems	3-0-0	3
ELL820	Photonic Switching and Networking	3-0-0	3
ELP720	Telecommunication Networks Laboratory	0-1-4	3
ELP821	Advanced Telecommunication Networks Laboratory	0-1-4	3
ELP822	Network Software Laboratory	0-1-4	3
ELL898	Pervasive Computing	3-0-0	3
ELL887	Cloud Computing	3-0-0	3
ELL797	Energy-Efficient Computing	3-0-0	3

#### Programme Electives (PE): Stream: Multimedia Information Processing (MIP)

Course#	Title	L-T-P	Credits
<b>ELL786</b>	<b>Multimedia Systems</b>	<b>3-0-0</b>	<b>3</b>
<b>ELL787</b>	<b>Embedded Systems and Applications</b>	<b>3-0-0</b>	<b>3</b>
ELL784	Introduction to Machine Learning	3-0-0	3
ELL785	Computer Communication Networks	3-0-0	3
ELL715	Digital Image Processing	3-0-0	3
ELL720	Digital Signal Processing 1	3-0-0	3
ELL792	Computer Graphics	3-0-0	3
CRL707	Human and Machine Speech Communication	3-0-0	3
ELL793	Computer Vision	3-0-0	3
ELL788	Computational Perception and Cognition	3-0-0	3
ELL882	Large Scale Machine Learning	3-0-0	3

ELL711	Signal Theory	3-0-0	3
ELL719	Detection and Estimation	3-0-0	3
ELL718	Statistical Signal Processing	3-0-0	3
ELL714	Basic Information Theory	3-0-0	3
ELL813	Advanced Information Theory	3-0-0	3
ELL710	Coding Theory	3-0-0	3



Programme Electives (PE): Stream: Internet Technologies (IT)

Course#	Title	L-T-P	Credits
<b>ELL784</b>	<b>Introduction to Machine Learning</b>	<b>3-0-0</b>	<b>3</b>
<b>ELL785</b>	<b>Computer Communication Networks</b>	<b>3-0-0</b>	<b>3</b>
ELL786	Multimedia Systems	3-0-0	3
ELL787	Embedded Systems and Applications	3-0-0	3
ELP781	Digital Systems Lab	0-1-4	3
<b>ELP721</b>	<b>Embedded Telecom Systems Lab</b>	<b>0-1-4</b>	<b>3</b>
ELL892	Internet Technologies	3-0-0	3
ELP780	Software Lab	0-1-4	3
ELP782	Computer Networks Lab	0-1-4	3
ELL798	Agent Technologies	3-0-0	3
ELL896	Mobile Computing	3-0-0	3
ELL884	Information Retrieval	3-0-0	3
ELL898	Pervasive Computing	3-0-0	3
<b>ELL766</b>	<b>Appliance Systems</b>	<b>3-0-0</b>	<b>3</b>
ELL895	Network Security	3-0-0	3
<b>ELL765</b>	<b>Smart Grid Technology</b>	<b>3-0-0</b>	<b>3</b>
<b>ELL772</b>	<b>Planning and Operation of a Smart Grid</b>	<b>3-0-0</b>	<b>3</b>
<b>ELP855</b>	<b>Smart Grids Lab</b>	<b>0-1-4</b>	<b>3</b>
<b>ELL723</b>	<b>Broadband Communication Systems</b>	<b>3-0-0</b>	<b>3</b>
ELL887	Cloud Computing	3-0-0	3
ELL797	Energy-Efficient Computing	3-0-0	3

