BSc in Computer Engineering
(See Sheet2 for a list of acronyms of courses)

Areas and topics / Courses	Core Courses (Modules, Subjects)																						Elective Courses (Modules, Subjects)											Total
	MA1	MA2	PH	EE	EL	DC	IPR	PL	OOP	DS	PS	SCC	IM	ADS	SWE	MP	CO	CA	CN	OS	DB	CG	MA3	EM	CP	LAN	TFT	CS	EMC	RTS	INF	VLS	IS	
MA. Mathematics																																		
MA1. Complex numbers and polynomials	**5**																																	**5**
MA2. Matrices, determinants	**5**																																	**5**
MA3. Systems of linear algebraic equations	**5**																																	**5**
MA4. Limits of functions	**5**																																	**5**
MA5. Differential calculus of single variable functions	**5**																																	**5**
MA6. Basic integration methods	**5**																																	**5**
MA7. Definite integral and applications		**5**																																**5**
MA8. Functions of several variables																							**4**											**4**
MA9. Differential equations		**5**																																**5**
MA10. Multiple integrals																							**5**											**5**
MA11. Linear and surface integrals																							**4**											**4**
MA12. Function of complex variables, Fourier series		**5**																																**5**
MA13. Operation calculus and application																							**4**											**4**
MA14. Numerical methods		**5**																																**5**
MA15. Theory of probability		**5**																					**4**											**9**
MA16. Mathematical statistics		**5**																					**4**											**9**
PH. Physics																																		
PH1. Measuring of physical quantities			**3**																															**3**
PH2. Interaction in nature			**4**																															**4**
PH3. Work and energy			**4**																															**4**
PH4. Special theory of relativity			**4**																															**4**
PH5. Electric field and electric current			**4**																															**4**
PH6. Magnetic field and electro-magnetic induction			**4**																															**4**
PH7. Periodic processes and waves			**4**																															**4**
PH8. Emitting and absorbing light			**3**																															**3**
EE. Electrical Engineering																																		
EE1. Physical fundamental of electro-magnetic fields				**2**																														**2**
EE2. Settled modes in linear electric chains				**4**																														**4**
EE3. Transient processes in linear electric chains				**4**																														**4**
EE4. Chains with distributed parameters				**3**																														**3**
EE5. Non-linear electric chains				**4**																														**4**
EE6. Discrete time signals				**3**																														**3**
EE7. Fourier analysis				**3**																														**3**
EE8. Laplace transforms				**3**																														**3**
EE9. Measuring parameters of electric chains																								**5**										**5**
EE10. Virtual measuring systems																								**5**										**5**
EE11. Basic measuring tools in computer engineering																								**5**										**5**

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CT. Circuits and Systems																																		
CT1. Physical fundamentals of semi-conductors					2																												2
CT2. Diodes and diode circuits					3																												3
CT3. Bipolar transistors					4																												4
CT4. MOS and Field transistors					5																												5
CT5. Active filters					5																												5
CT6. Forming circuit						6																											6
CT7. Logic circuits						6																											6
CT8. Interface circuits						6																											6
CT9. Structure synthesis of combination logic circuits						6																											6
CT10. Serial circuits						6																											6
CT11. Power curcuits				2																													2
PF. Programming Fundamentals																																	
PF1. Working with office applications											6																						6
PF2. Basic data types							5																										5
PF3. Fundamental programming constructs							5	2																									7
PF4. Algorithms and problem solving								4																									4
PF5. Fundamental data structures							5	2						4																			11
PF6. Files								4																									4
PF7. Recursion								1	2					2																			5
PF8. Advanced non-linear structures								2	5					4																			11
PF9. Overview of programming languages								1																									1
PF10. Object-oriented programming									12																								12
PF11. Event-driven programming								4	5																								9
DS. Discrete Structures																																	
DS1. Functions, relations and sets										2																							2
DS2. Basic logic										3																							3
DS3. Boolean algebra and functions										3																							3
DS4. Proof techniques										4																							4
DS5. Graphs and trees										4																							4
DS6. Discrete probability										5																							5
DS7. Petri nets										3																							3
DS8. Markov chains										3																							3
DS9. Queuing systems										3																							3
DS10. Cryptographic methods																												5					5
PM. Principles of Management																																	

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PM1. Market mechanism													2																					2
PM2. Public sector and tax system													2																					2
PM3. Consumer behaviour											4		2																					6
PM4. Production, expenses and income of a firm													2																					2
PM5. Price-forming of manufacturing factors													2																					2
PM6. Economic cycle													3																					3
PM7. Company information systems													3																		3			6
PM8. Marketing systems													2																					2
PM9. Investment and crediting systems													2																					2
PM10. Finance and accountancy systems													2																					2
SP. Social & Professional Issues																																		
SP1. History of computing							3																											3
SP2. Social context of computing							3				3	1																						7
SP3. Methods and tools of analysis											4	4																						8
SP4. Professional and ethical responsibilities											4	3																						7
SP5. Risks and liabilities of computer-based systems												4																						4
SP6. Intellectual property.												5																						5
SP7. Privacy and civil liberties											4	2																						6
SP8. Computer crime												6																						6
AC. Algorithms & Complexity																																		
AC1. Basic algorithmic analysis							4							2																				6
AC2. Algorithmic strategies														3																				3
AC3. Fundamental computing algorithms														3																				3
AC6. Basic computability theory														4																				4
AC7. Algorithms for compression and decompression														4																				4
AC8. Cryptographic algorithms														4														6						10
CG. Computer Graphics and HCI																																		
CG1. Fundamental techniques in graphics																						3												3
CG2. Graphic systems																						5												5
CG3. Geometric modelling																						6												6
CG4. Basic rendering																						6												6
CG5. Computer animation																						5												5
CG6. Visualization																						5												5
CG7. Foundation of human-computer interaction															2																			2
CG8. Building a simple graphical user interface															2																2			4
CG9. Graphical user interface design															2																2			4

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SE. Software Engineering																																		
SE1. Life cycle of a software product															3																			3
SE2. Software requirements and specifications															2																			2
SE3. Software testing and validation															2																			2
SE4. Software evolution															2																			2
SE5. Software documenting															2																			2
SE6. Software tools and environments															3																			3
SE7. Using APIs								4																										4
SE8. Component-based computing								4	6																									10
SE9. Specialised system development															2																			2
SE10. Software project management													3		4																			7
CO. Computer Organization																																		
CO1. Machine level representation of data																	4																	4
CO2. Arithmetic basis																	4																	4
CO3. Main signals and logic structure of a processor																3	3																	6
CO4. Structure of arithmetic and logic unit																	4																	4
CO5. Structure of control unit																	4																	4
CO6. Structure of interrupt system																3	2	3							2									10
CO7. Input/output devices																	5								6									11
CO8. External storage devices																									7									7
CO9. Peripheral interfaces																3		3							6									12
CA. Computer Architecture																																		
CA1. Basic computer architectures																		5																5
CA2. Pipelining																		4																4
CA3. Assembly level machine organisation																5		3																8
CA4. Programming in Assembly language																5		3																8
CA5. Memory system organisation and architecture																		7																7
CA6. Bus organization of a computer																5		2																7
CA7. Interfacing and communication																		6																6
CA8. Functional organization																	2	3																5
CA9. Performance enhancements																		4																4
CN. Computer Networks																																		
CN1. Data communication																			5															5
CN2. Network protocol stacks																			6															6
CN3. Communication sub-network																			4															4
CN4. Network management																			8							2								10
CN5. WANs. INTERNET																			7															7

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CN6. Wireless and mobile computing																										4								4
CN7. RF technology																										4								4
CN7. Passive components and LAN equipment																										4								4
CN8. LAN technologies																										4								4
CN9. Network integration																			5							3								8
CN10. Administration and management of LANs																										4								4
CN11. Cryptographic protocols																			4									4						8
CN12. Network security																			4									4						8
TF. Testing and fault tolerance																																		
TF1. Faults and fault models in digital circuits																											2							2
TF2. Test generation methods																											2							2
TF3. Design for testability															2												2							4
TF4. Testing non-stuck-at faults																											3							3
TF5. System-level testing and diagnosis																	2										2							4
TF6. Reliability and fault tolerance definitions																											4							4
TF7. Error detecting and correcting codes																			2						4		2							8
TF8. Fault-tolerant system design																		2									2							4
TF9. Software approaches and fault-tolerance															2												2							4
OS. Operating Systems																																		
OS1. Operating system overview																				2														2
OS2. Operating system principles																				4														4
OS3. Process description and control																				4														4
OS4. Concurrency																				5														5
OS5. Scheduling and dispatch																				4														4
OS6. Memory management																				4														4
OS7. I/O management and disk scheduling																				3														3
OS8. File management																				2														2
OS9. Security and protection																				2								3						5
ES. Embedded Systems																																		
ES1. Fundamentals of embedded systems																4													6					10
ES2. Classification of embedded systems																													4					4
ES3. Language issues																													8					8
ES4. Real-time systems overview																														4				4
ES5. Decomposition of real-time systems																														4				4
ES6. Task management of real-time systems																														4				4
ES7. Real-time planning algorithms																														4				4
ES8. Verification methods for real-time systems																											2			4				6

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ES9. High integrity software systems																											2		7					9
DB. DBMS																																		
DB1. Data modelling																					6													6
DB2. Architecture of DBMS																					3													3
DB3. Relational databases																					4													4
DB4. Object-oriented databases																					6													6
DB5. Database query languages																					6													6
DB5. Data mining																															5			5
DB6. Transaction processing																					2													2
DB7. Life cycle of information systems development																															5			5
DB8. Information storage and retrieval																															5			5
DB9. Data security and integrity																					3							3			3			9
VD. VLSI Design																																		
VD1. MOS transistor fundamentals					2																											2		4
VD2. Processing and layout																																2		2
VD3. Function of the basic inverter structure																2																2		4
VD4. Circuit characterisation and performance																																2		2
VD5. Combinational logic circuits																																3		3
VD6. Sequential logic circuits																																3		3
VD7. Alternative circuit structures / low power design				2	4																											3		9
VD8. Semiconductor memories and array structures					5																											2		7
VD9. Chip input/output circuits																																2		2
VD10. Semi custom design technologies																																2		2
VD11. ASIC design methodology																																2		2
IS. Intelligent Systems																																		
IS1. Fundamental issues in intelligent systems																																	3	3
IS2. Architecture of an intelligent system																																	4	4
IS3. Knowledge representation and reasoning																																	5	5
IS4. Non-procedural programming languages								2																									4	6
IS5. Neural networks																																	4	4
Total hours	30	30	30	30	30	30	25	30	30	30	25	25	25	30	30	30	30	45	45	30	30	30	25	15	25	25	25	25	25	20	25	25	20	