MSc in Software Engineering
(See Sheet2 for a list of acronyms of courses)

Areas and topics / Courses	Core Courses (Modules, Subjects)													Elective Courses							Total
	SDD	SA	STQA	RTSE	SPM	KBS	AWT	CVS	CASE	NT	LEA	GUID	RMT	AMA	ACA	SP	HMM	DS	PACS	PSYS	
AMA. Advanced Mathematics for SE																					
AMA1. Vector algebra														2							2
AMA2. Computing sums														2							2
AMA3. Line and surface integrals														2							2
AMA4. Scalar and vector potentials														2							2
AMA5. Orthogonal curvilinear coordinates														2							2
AMA6. Partial differential equations														3							3
AMA7. Recursive relations						2															2
AMA8. Deriving functions														2							2
AMA9. Operation calculus and application														3							3
AMA10. Numerical methods			2					1						3							6
AMA11. Theory of probability			2											3							5
AMA12. Mathematical statistics			2																		2
AMA13. Statistical models			2																		2
AMA14. Discrete probability theory				1										1							2
AMA15. Queuing theory					1													2	1		4
AMA16. Asymptotic methods				1				1													2
AMA17. Combinatorial methods			2					1													3
AMA18. Representation of discrete functions				1										2							3
AMA19. Random variable generation			2											3							5
AMA20. Markov models																			2		2
ADS. Advanced Data Structures and Algorithms																					
ADS1. Problem solving strategies					2	1															3
ADS2. Advanced non-linear structures		1																			1
ADS3. Proof Techniques						1															1
ADS4. Algorithmic strategies		2				1															3
ADS5. Algorithms for compression and decompression		1															4				5
ADS6. Parallel algorithms	2																			4	6
ADS7. Distributed algorithms	2																	3			5
ADS8. Genetic algorithms	2																				2
ADS9. The complexity classes P and NP	2			2																	4
ASA. Advanced Software Architectures																					
ASA1. Architectural styles (macroarchitecture)		2																			2
ASA2. Design patterns (microarchitecture)		2																			2
ASA3. Object-oriented architectural design		2																			2
ASA4. Design prototyping		2			1											2					5
ASA5. Software integration strategies		2			2											2					6

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ASA6. Data integration strategies		2			2											2					6
ASA7. Identifying the configuration of a system	3	1																			4
ASA8. Configuration and maintaining the integrity		2																			2
ASA9. Configuration and maintaining the traceability		2																			2
ASA10. Process-Centered Software Engineering Environments		2							2												4
ASA11. Process Metamodelling		2														2			1		5
ASA12. Commitment Nets in Software Process Improvement		1			2		2														5
ISD. Advanced Issus in Software Design and Development																					
ISD1. From object-process analysis to object-process design	1															2					3
ISD2. Object-oriented software engineering	3															2					5
ISD3. Formal methods for object-oriented software engineering	3																				3
ISD4. Object-oriented Web-based software engineering	3																				3
ISD5. Process-based software engineering	3															2					5
ISD6. Multimedia software engineering	2																3				5
ISD7. Scenario planning	2								2							2					6
ISD8. Scenario design	2								2			1				2					7
ISD9. Scenario development tools									3			2									5
ISD10. Media authoring									3			2					2				7
ISD11. Implementation through wizards	3	2							2			1									8
ISD12. Project management tools					2				2												4
ISD13. Integration tools									3												3
ISD14. Managing object-oriented software development					2											2					4
ISD15. Groupware Technology					2		3		1							2					8
ISD16. Computer-supported cooperation	3				2		2									2					9
ISD17. Object modelling environments					2				3										1		6
ISD18. Performance analysis models																			3		3
TVT. Advanced Testing & Verification Technology																					
TVT1. Unit testing			2																		2
TVT2. Performance testing			3																		3
TVT3. Integration testing			3																		3
TVT4. System testing			3																		3
TVT5. Acceptance testing			2																		2
TVT6. Project assessment services			2		2																4
TVT7. Evaluation & Project progress			2		1											2			2		7
TVT8. Metrics for quality and concurrency in object-based systems			2		2														2		6
TVT9. Software Evolution Processes	2		2		1											2					7
TVT10. Automatic Verification of Static Policies on Software Models			2																		2

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TVT11. Effectively Managing Process Diversity					2											2					4
TVT12. Testing Processes of Web Applications			3				2														5
DSM. Distributed Systems & Computational Models																					
DSM1. Distributed models										3								3	2		8
DSM2. Network operating systems										3											3
DSM3. Data security and integrity										3								2			5
DSM4. Distributed database systems																		4			4
DSM5. Query processing in distributed databases																		4			4
DSM6. Optimizing object queries																		3			3
DSM7. Semantic modelling in multimedia databases																	4	2			6
DSM8. Data mining						2	2											2			6
DSM9. Distributed visual reasoning for information retrieval on the Web							3											3			6
DSM10. Data managemet issues in CSCW systems	2				2		3											2			9
MS. Modelling and Simulation																					
MS1. Complex dynamic system								1													1
MS2. Modelling methods and algorithms								1											1		2
MS3. Testing the model adequacy								2													2
MS4. Simulation and animation methods								2													2
MS5. Simulation languages								2													2
MS6. Intelligent modelling and simulation systems								2				2									4
MS7. Rendering and animation								2											2		4
MS8. Non-lilear animation								2													2
MS9. Virtual reality								2				2									4
MS10. Discrete system simulation								2													2
MS11. Knowledge-Based Software Process Simulation Model						2															2
MS12. Validation of simulation models								2											1		3
MS13. Modelling storage																			2		2
RTS. Real-Time Systems																					
RTS1. Basics of real-time systems				2																	2
RTS2. Development of real-time software systems				3																	3
RTS3. Uniprocessor scheduling and resource management				2																	2
RTS4. Multiprocessor scheduling and load sharing				2															1		3
RTS5. Real-time kernels				2																	2
RTS6. Time-constrained communications				2																	2
RTS7. Concurent programming				2																	2
RTS8. Real-time programming languages				2																	2

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RTS9. Real-time operating systems				2															1		3
RTS10. Fault-tolerance			3	2																	5
RTS11. Advances in design and analysis for real-time applications	2		2	2																	6
RTS12. Object-oriented specification and formal verification of RTS				2																	2
ITM. Internet Technologies, Multimedia & HCI																					
ITM1. Web-based programming languages							2										4				6
ITM2. Client-server technology							2			2											4
ITM3. WAP approaches							2			3											5
ITM4. Internet and communication protocols							2			2											4
ITM5. XML							4										3				7
ITM6. Information agent technology for the Internet							2										2				4
ITM6. Interaction styles								2													2
ITM7. User modeling								2				2									4
ITM8. Interactive 3D Development								2				2									4
ITM9. Intelligent interfaces												3									3
ITM10. VAR and intelligent interfaces												3					2				5
ITM11. Virtual reality for Knowledge-Based Systems						2															2
ITM12. Internet Software Engineering	2						2														4
ITM13. Model-based user interface development								1				2									3
ITM14. Authomatic generation of hypermedia									4								3				7
ITM15. Graphical query languages									3			2									5
ITM16. Linguistic approach to user interface design												3									3
ITM17. Context-specific guidelines to user interface design												3									3
ITM18. Web applications for E-Commerce							4														4
ITM19. Web applications for E-Publishing							4														4
ITM20. Web applications for E-Learning							4														4
ACA. Advanced Computer Architectures																					
ACA1. High performance machines & special purpose processors															3						3
ACA2. RISC computers															4						4
ACA3. Superscalar processors															4						4
ACA4. VLIW processors															3						3
ACA5. Parallel processing and pipelining															3						3
ACA6. Architectures for parallel computation															4						4
ACA7. Energy aware computing															3						3
ACA8. Data flow architectures		2													3						5
ACA9. High performance I/O															3						3

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ANT. Advanced Network Technologies																					
ANT1. High-performance computer design focusing on networks										2											2
ANT2. Multiprocessors, multi-computers and networks										3											3
ANT3. Processor-memory and processor-processor communication										2											2
ANT4. Network topology, routing methods, flow control										3											3
ANT5. Router microarchitecture, and performance analysis										3											3
ANT6. High-speed networking										3											3
ANT7. ATM										2											2
ANT8. Optical networks										2											2
ANT9. Wireless systems and networks										3											3
ANT10. Administration and management of LANs										3											3
ANT11. Network sequrity										3											3
ANT12. Modelling network behaviour																			2		2
ANT13. Modelling locks																			2		2
ANT14. Modelling critical sections																			2		2
ANT15. Modelling concurrency																			2		2
KM. Knowledge Management																					
KM1. Knowledge audit						1															1
KM2. Knowledge technology						2															2
KM3. Knowledge scenario's						1															1
KM4. Knowledge development						2															2
KM5. Knowledge management styles						2															2
KM6. Interactive knowledge management						2															2
KM7. Knowledge economy and management						1															1
KM8. Evaluation and validation of knowledge management			2			2					2										6
KM9. Knowledge management and social engineering	1					2					2										5
KM10. Intelligent agent technologies						2					2						3				7
KM11. Knowledge representation in multimedia databases						2															2
GOT. General Organization Theory																					
GOT1. Hierarchical and flow models of organization											2										2
GOT2. Organizational work groups											3										3
GOT3. Organizational span. Single user. Work group. Team. Enterprise. Global											3										3
GOT4. Software sales, licensing and agency											4										4
GOT5. Contract and privacy law											4										4
GOT6. Ethics and protection of intellectual propetry rights											4										4
GOT7. CS society and ethics											4										4

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PPR. Parallel Programming																					
PPR1. Parallel computer systems																				**4**	**4**
PPR2. Homogeneous computational structures																				**4**	**4**
PPR3. Transputers																				**4**	**4**
PPR4. Data parallelism																				**3**	**3**
PPR5. High-level language constructs for parallel programming																				**4**	**4**
PPR6. Decomposition techniques																				**3**	**3**
PPR7. Parallel computing paradigms																				**2**	**2**
PPR8. Concurrency and control																				**2**	**2**
Total hours	**45**	**30**	**45**	**30**	**30**	**30**	**45**	**30**	**30**	**45**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	

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Type	Acronym	Course (Module, Subject) Name
Core	SDD	Software Design and Development
	SA	Software Architectures
	STQA	Software Testing & Qality Assurance
	RTSE	Real-time Software Engineering
	SPM	Software Project Management
	KBS	Knowledge-Based Systems
	AWT	Advanced Web Technologies
	CVS	Computer Vision and Simulation
	CASE	CASE Tools for Software Development
	NT	Network Technologies
	LEA	Legal and Ethical Aspects
	GUID	Graphical User Interface Design
	RMT	Research and Master' Thesis
Elective	AMA	Advanced Mathematics
	ACA	Advanced Computer Architectures
	SP	Software Planning
	HMM	Hypermedia & Multimedia
	DS	Distributed Systems
	PACS	Performance Analysis of Computer systems
	PSYS	Parallel Systems