Tables of specifications

Computing programs

Artificial Intelligence (AI)

Group	GKU	Code	Weight	#Q	SKU	Weight	#Q
Core Units	1. Algorithms, Computability, and Complexity	AC	8%	5	1.1: Basic Analysis and methods	4%	3
					1.2: Fundamentals of Data Structures	4%	2
	2. Architecture and Organization	AD	8%	8	2.1: Digital Logic and Digital Systems	2%	2
					2.2: Representation of Data on the Machine Level	2%	2
					2.3: Machine Organization on the Assembly Level	2%	2
					2.4: Architecture of Memory System	2%	2
	3. Applied Computer Science	AS	7%	6	3.1: Database Systems	3%	2
					3.2: Fundamentals of Graphs and Visualization	2%	2
					3.3: Foundations of Human-Computer Interaction	2%	2
	4. Networking and computer Security	NS	7%	6	4.1: Introduction to Networking and Communications	2.5%	2
					4.2: Security Concepts	2.5%	2
					4.3: Defensive programming	2%	2
	5. Operating Systems	OS	8%	8	5.1: Operating System Principles	2%	2
					5.2: Scheduling and Dispatch	2%	2
					5.3: Memory Management	2%	2
					5.4: Security and Protection	2%	2
	6. Programming	PR	13%	6	6.1: Object-Oriented Programming	4%	2
					6.2: Functional Programming	4%	2
					6.3: Basic Type Systems	5%	2
	7. Software Engineering	SE	7%	6	7.1: Software Processes and Project Management	2%	2
					7.2: Requirements Engineering	2%	2
					7.3: Software Design	3%	2
Core Specialized Units	8. Fundamentals of AI	FA	13%	7	8.1: AI Principles and Techniques	6.5%	4
					8.2: Knowledge Representation and Reasoning	6.5%	3
	9. Machine Learning	ML	13%	8	9.1: Machine Learning	13%	8
	10. Deep Learning	DL	13%	8	10.1: Deep Learning Models	13%	8
	11. Ethics	ET	3%	2	11.1: Ethical Issues and Privacy	3%	2
Total			**100%**	**70**		100%	70

Computer Engineering (CE)

Group	GKU	Code	Weight	#Q	SKU	Weight	#Q
Core Units	1. Electrical Circuits	EC	12%	8	1.1 Electrical fundamentals and analysis	8%	5
					1.2 Basic transistor circuits	4%	3
	2. Computer Architecture	CA	16%	11	2.1 Instruction Set Architecture and Computer arithmetic	8%	6
					2.2 Processor and memory organization	8%	5
	3. Digital Design	DD	10%	8	3.1 Boolean algebra applications and basic logic circuits	5%	4
					3.2 Design of combinational and sequential circuits	3%	2
					3.3 Control and datapath design	2%	2
	4. Embedded Systems	ES	10%	7	4.1 Microcontrollers	6%	4
					4.2 Digital and analog interfacing and communication	4%	3
	5. Communication Networks	CN	10%	7	5.1 Network architecture, protocols and management	5%	3
					5.2 Internet of Things	2.5%	2
					5.3 Software defined networking	2.5%	2
	6. Cybersecurity	CY	8%	5	6.1 Security and Vulnerabilities	8%	5
	7. Signal Processing	SR	9%	6	7.1 Convolution and transformation	4.5%	3
					7.2 Sampling and aliasing	4.5%	3
	8. Systems and Project Engineering	SP	10%	7	8.1 Project management principles	4%	3
					8.2 System Engineering	6%	4
	9. Programming and algorithms	PA	15%	11	9.1 Programming constructs and paradigms	3%	3
					9.2 Data structures	3%	2
					9.3 Object-oriented design	3%	2
					9.4 Database systems	3%	2
					9.5 Algorithms analysis and complexity	3%	2
Total			**100%**	**70**		100%	70

Computer Science (CS)

Group	GKU	Code	Weight	#Q	SKU	Weight	#Q
	1. Algorithms, Computability, and Complexity	AC	11%	8	1.1: Basic Analysis and Algorithmic Methods	5.5%	4
					1.2: Fundamentals of Data Structures, Automata and Computability	5.5%	4
	2. Architecture and Organization	AO	11%	8	2.1: Digital Logic, Digital Systems, and Representation of Data on the Machine Level	4%	4
					2.2: Machine Organization on the Assembly Level	3.5%	2
					2.3: Architecture of Memory System, Interfacing and Communication	3.5%	2
	3. Discrete Structures	DC	14%	10	3.1: Basic Logic, Sets, Relations, and Functions	6%	4
					3.2: Proof Techniques, and Basics of Counting	4%	3
					3.3: Graphs, Trees, and Discrete Probability	4%	3
	4. Information Management	IM	9%	6	4.1: Database Systems and Data Modeling	9%	6
	5. Networking and Communications	NC	7%	5	5.1: Introduction to Networking and Communications	4%	3
					5.2: Reliable Data Delivery, Routing and Forwarding, and Resource Allocation	3%	2
	6. Operating Systems	OS	9%	6	6.1: Operating System Principles	4.5%	3
					6.2: Concurrency, Scheduling, Dispatch, Memory Management, Security and Protection of OS	4.5%	3
	7. Programming Languages	PL	15%	10	7.1: Object-Oriented Programming, and Functional Programming	6%	4
					7.2: Basic Type Systems	5%	3
					7.3: Program Representation, Language Translation and Execution	4%	3
	8. Software Development Fundamentals	SD	14%	10	8.1: Algorithms, Design, and Development Methods	7%	5
					8.2 Fundamental Programming Concepts and Data Structures	7%	5
	9. Software Engineering	SE	10%	7	9.1 Software Processes, Software Management, and Requirements Engineering	4%	3
					9.2 Software Design, Construction, Verification and Validation	6%	4
Total			**100%**	**70**		100%	70

Cybersecurity (Cyber)

Group	GKU	Code	Weight	#Q	SKU	Weight	#Q
Core Units	1. Cybersecurity Foundations	CF	10%	7	1.1 Cybersecurity Foundations	10%	7
	2. Data Security	DA	21%	15	2.1 Basic Cryptography	10%	7
					2.2 Digital forensics	3%	2
					2.3 Database	4%	3
					2.4 Data Structures	4%	3
	3. Software Security	SS	12%	9	3.1 Basic Scripting and Programming	5%	4
					3.2 Cybersecurity Design Principles	4%	3
					3.3 Algorithms	3%	2
	4. Component Security	CS	4%	3	4.1 IT Systems Components	4%	3
	5. Network Security	NE	20%	14	5.1 Basic Networking and Protocols	10%	7
					5.2 Network Defence	5%	4
					5.3 Network Security Administration	5%	3
	6. System Security	SY	10%	7	6.1 Operating Systems Concepts	6%	4
					6.2 Operating Systems Hardening	4%	3
	7. Human Security	HS	10%	6	7.1 Cyber Threats	10%	6
	8. Organizational Security	OR	13%	9	8.1 Policy, Legal, Ethics and Compliance	4%	3
					8.2 Security Risk Analysis	9%	6
Total			**100%**	**70**		100%	70

Information Systems (IS)

Group	GKU	Code	Weight	#Q	SKU	Weight	#Q
Core Units	1. IS Foundational	IF	30%	21	1.1 Information Systems Foundations	30%	21
	2. Data/Information	DI	10%	7	2.1 Data and Information Management	10%	7
	3. Technology	TE	18%	13	3.1 IT infrastructure	12%	9
					3.2 Secure Computing	6%	4
	4. Development	DE	20%	14	4.1 Systems Analysis and Design	6%	5
					4.2 Programming	8%	5
					4.3. Application Development	6%	4
	5. Organizational Domain	OD	10%	7	5.1 IS Ethics, Sustainability, Use and Implications for Society	4%	3
					5.2 IS Management and Strategy	6%	4
	6. IS Integration	IT	12%	8	6.1 IS Project Management	6%	4
					6.2 IS Practicum	6%	4
Total			**100%**	**70**		100%	70

Information Technology (IT)

Group	GKU	Code	Weight	#Q	SKU	Weight	#Q
Core Units	1. User Experience Design	UE	10%	7	1.1 User Research	3.5%	3
					1.2 User Testing	3%	2
					1.3 Interaction Design	3.5%	2
	2. Global Professional Practice	GP	10%	8	2.1 Project management principles	4.5%	4
					2.2 Ethical, legal, and privacy issues	2.5%	2
					2.3 Information systems principles	3%	2
	3. Cybersecurity Principles	CP	10%	8	3.1 Cyber-attacks and detection	3%	2
					3.2 Vulnerabilities, threats, and risk	2.5%	2
					3.3 Cryptography overview	3%	2
					3.4 Security services, mechanisms, and countermeasures	1.5%	2
	4. Networking	NT	10%	7	4.1 Foundations of networking	5%	4
					4.2 Network management	5%	3
	5. Platform Technologies	PT	10%	6	5.1 Operating systems	10%	6
	6. Information Management	IN	15%	11	6.1 Data-information concepts	4.5%	5
					6.2 Data modeling	3.5%	2
					6.3 Managing the database environment	3.5%	2
					6.4 Database query languages	3.5%	2
	7. System Paradigms	SA	10%	6	7.1 Requirement engineering and testing	10%	6
	8. Software Fundamental	SF	15%	10	8.1 Problem solving strategies	4.5%	2
					8.2 Program development	5%	4
					8.3 Fundamental data structures and algorithms	5.5%	4
	9. Web and Mobile Systems	WM	10%	7	9.1 Web and mobile systems concepts and technologies	10%	7
Total			**100%**	**70**		100%	70

Software Engineering (SWE)

Group	GKU	Code	Weight	#Q	SKU	Weight	#Q
Core Subjects	1. Computing Foundations	CO	33%	22	1.1 Computer science foundations	20%	13
					1.2 Engineering Design	3%	2
					1.3 Software Development	3%	2
					1.4 Design Planning and Construction	3%	2
					1.5 Construction tools	4%	3
	2. Mathematical and Engineering Fundamentals	ME	17%	12	2.1 Discrete Structures	9%	6
					2.2 Engineering foundations for software	4%	3
					2.3 Engineering economics for software	4%	3
	3. Professional Practice	PP	6%	4	3.1 Software Project Management	6%	4
	4. Software Modelling and Analysis	SM	6%	4	4.1 Modeling and Analysis foundations	6%	4
	5. Requirements Analysis and Specification	RA	6%	4	5.1 Requirements Engineering	6%	4
		SO	10%	7	6.1 Design Concepts and Strategies	7%	3

	6. Software Design				6.5 Detailed design	2%	2
					6.6 Detailed evaluation	1%	2
	7. Software Verification & Validation	SV	8%	6	7.1 Verification and Validation	4%	3
					7.3 Testing and Reporting	4%	3
	8. Software Process	SW	7%	6	8.1 Process concepts and Implementation	2.5%	2
					8.3 Project planning and tracking	2%	2
					8.4 Software configuration management and Evolution Processes	2.5%	2
	9. Software Quality	SQ	4%	3	9.1 Software quality, process assurance, and product assurance	4%	3
	10. Security	SU	2%	2	10.1 Security fundamentals	2%	2
Total			**100%**	**70**		100%	70