Fourth Year							
First Semester							
Course ID	Course Name	Credit Hours	ECTS	Contact Hours		Type	Prerequisites / Corequisites
				Lect.	Prac.		
	elective course	3					
	elective course	3					
	elective course	3					
	elective course	3					
	Total	**12**	**0**	**0**	**0**		

Fourth Year							
Second Semester							
Course ID	Course Name	Credit Hours	ECTS	Contact Hours		Type	Prerequisites / Corequisites
				Lect.	Prac.		
CS491	International Internship 20 weeks	12		20 weeks		F2F	CS391
	Total	**12**	**0**	**0**	**36**		

Prerequisite courses for the German year

Passing four of the following courses:

- CS222 Theory of Algorithms
- CS223 Data Structures
- CS342 Software Engineering
- CS263 Database Management Systems
- CS355 Web Technologies

[d]Courses attended and/or passed during International Internship are not transferable

VI. Compulsory Courses Offered by Computer Science Department for General, Cybersecurity, and Data Science Tracks

CS116: Computing Fundamentals **3 Cr Hr (3,0)** **- ECTS**

Basic computer skills, programming concepts, algorithms, variables and data types; arithmetic, logical, relational, Boolean, and assignment operators; simple input and output statements, selection structures, loop structures, single and multidimensional arrays, character strings, functions, data structures, pointers, input/output file operations.

Prerequisites: -

CS1160: Computing Fundamentals Lab **1 Cr Hr (0,3)** **- ECTS**

Lab session every week to offer hands-on experience on the topics that are covered in CS116, which are: algorithms, variables and data types; arithmetic, logical, relational, Boolean, and assignment operators; simple input and output statements, selection structures, loop structures, single and multidimensional arrays, character strings, functions, data structures, pointers, input/output file operations.

Prerequisites: CS116^{co}

CS115: Computing Fundamentals **3 Cr Hr (3,0)** **- ECTS**

Basic information technology (IT) skills and concepts, the Internet and the web, electronic commerce, application software, system software, basics of computer hardware: the system unit, input and output devices, secondary storage; creating web-pages using HTML and cascading style sheets (CSS), database concepts, database management systems, basics of the structured query language (SQL), communications and networks, privacy, security, computer ethics, information systems, systems analysis and design, programming basics: variables, data types, arithmetic and logic expressions, input/output operations, selection structures, loop structures, arrays.

Prerequisites: -

CS1150: Computing Fundamentals Lab **1 Cr Hr (0,3)** **- ECTS**

Lab session every week to offer hands-on experience on the topics that are covered in CS115, which are: computer hardware, operating systems, web browsing, word processing programs, presentation programs, spreadsheet programs, creating web-pages using HTML and CSS, database management systems, database queries with SQL, programming basics: variables, data types, arithmetic and logic expressions, input/output operations, selection structures, loop structures, arrays.

Prerequisites: CS115^{co}

CS201: Discrete Structures **3 Cr Hr (3,0)** **- ECTS**

Fundamental structures: Functions (surjections, injections, inverses, composition); relations (reflexivity, symmetry, transitivity, equivalence relations); sets (Venn diagrams, complements, Cartesian products, power sets); Basic logic: Propositional logic; logical connectives; truth tables; predicate logic; universal and existential quantification; Proof techniques: Notions of implication, direct proofs; proof by counterexample; proof by contraposition; proof by contradiction; mathematical induction; recursive mathematical definitions; Basics of counting: pigeonhole principle; permutations and combinations. Discrete probability: Finite probability spaces; conditional probability, independence Bayes' rule; random events; random integer variables; mathematical expectation.

Prerequisites: MATH0099, ARB0099, ENGL0099