



REPUBLIKA E SHQIPËRISË

"ISMAIL QEMALI" UNIVERSITY
FACULTY OF TECHNICAL AND NATURAL SCIENCES
COMPUTER SCIENCE DEPARTMENT

SYLLABUS
PROGRAMMING IN C

Curriculum Developer

PhD. Dezdemonja Gjylapi

Credits and hours	Credits	Hour in the classroom						Individual study	Total
		Lectures	Seminars	Labs	Practice	Course project	Total		
	8 ECTS	45	30	15	0	0	90	110	200
Course Typology		B - Characteristic disciplines							
Academic year /semester		2025-2026/ First year, second semester							
Nature and requirement of the course		Mandatory course							
Study program		Bachelor in Computer Engineering							
Course Code		CS121E							
Email of curriculum developer / lecturer		dezdemonja.gjylapi@univlora.edu.al							

SUMMARY AND LEARNING OUTCOMES

Course Description	C Programming is one of the oldest programming languages around and despite the prevalence of higher-level languages, it continues to empower the world. C is a general-purpose language, ideal for building mostly state-of-the-art system applications like OS kernels, databases, embedded systems, and graphics packages that are used by billions around the world. The C Programming course introduces the learners to C programming language, which is a starting level for getting into programming. It starts from programming basics and gives a holistic view of the C Programming language, detailing all the aspects of the C language from data types, to operators and expressions, to if statements, further to loops, arrays, strings and pointers. The course also provides hands-on training to help you write and test your coding skill, and prepare you for real-life application.
Course Objectives	The course is designed to provide complete knowledge of C language. Students will be able to develop logics which will help them to create programs, applications in C. Also by learning the basic programming constructs they can easily switch over to any other language in future.
Expected Outcomes	By the end of the course, students should be able to: - Write well-structured, efficient, and maintainable C programs. - Solve programming problems using C programming constructs (variables, loops, functions, etc.).



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	▪ Implement basic algorithms and data structures in C. ▪ Efficiently manage memory using dynamic memory allocation and pointers. ▪ Handle file I/O and work with external files in C. ▪ Understand the C preprocessor, macros, and conditional compilation. ▪ Debug and optimize C programs for better performance. ▪ Apply best practices for clean and maintainable code.
FUNDAMENTAL CONCEPTS	
▪ Types and operators ▪ Control flow ▪ Functions ▪ Pointers ▪ Arrays ▪ Input and output ▪ Structures	

Week	COURSE TOPICS	Reference Literature	Teaching Methodology
I.	Topic 1 – Introduction to the CS 121E Syllabus. Introduction and C Programming environment. Topic 2 – General Introduction to computer systems. Hardware and software. Programming Languages and Languages Translators. Topic 3 – Understand the Basics of C Programming Language Seminar - Introduction to C Programming Language Lab- C Programming environment.	Syllabys CS 121E [1] page. 9-29	Lecture 1 hour Lecture 1 hour Lecture 1 hour Seminars 2 hours Lab 1 hour
II.	Topic 4 – Understanding of data types (int, float, char, double, etc.). Topic 5 – Proficiency with Variables, Constants, and Data Types. Topic 6 – Arithmetic Operators. Relational and Logical Operators Seminar - Exercises to be familiar with different data types, Operators and Expressions in C. Lab – Exercises to be familiar with different data types, Operators and Expressions in C.	[1] page. 35-48	Lecture 1 hour Lecture 1 hour Lecture 1 hour Seminars 2 hours Lab 1 hour
III.	Topic 7 – Control Flow. Statements and Blocks Topic 8 – IF structure. If- else. Break and Continue Instructions Topic 9 – While and do-while. Switch structure Seminar - Exercises on control flow Lab – Exercises to be familiar with different control flows, To understand the programming knowledge using Decision Statements (if, if-else, if-else-if ladder, switch and GOTO)	[1] page. 50-57	Lecture 1 hour Lecture 1 hour Lecture 1 hour Seminars 2 hours Lab 1 hour



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Week	COURSE TOPICS	Reference Literature	Teaching Methodology
IV.	Topic 10 – Functions and Program Structure. Basics of Functions Topic 11 – Functions Returning Non-integers. External Variables. Scope Rules. Header Files. Static Variables. Topic 12– Register Variables. Block Structure. Recursion Seminar - Exercises on functions to understand function programming, its types and function-call. Lab – Exercises on functions.	[1] page. 59-77	Lecture 1 hour Lecture 1 hour Lecture 1 hour Seminars 2 hours Lab 1 hour
V.	Topic 13 – One dimensional arrays, Initialization and their manipulation Topic 14 – operations with vector elements.Sum, Product and Number of elements. Topic 15 – Main operations with vector elements.Minimum, Maximum and Sorting of elements. Seminar - Exercises with vectors, sum, product, maximum, minimum of elements Lab – Exercises on vectors.	[1] page. 78-89	Lecture 1 hour Lecture 1 hour Lecture 1 hour Seminars 2 hours Lab 1 hour
VI.	Topic 16 – Two dimensional arrays, Initialization and their manipulation Topic 17 – Operations with Two dimensional arrays elements.Sum, Product and Number of elements. Topic 18 – Main operations with Two dimensional arrays .Minimum, Maximum and Sorting of elements. Seminar - Exercises with Two dimensional arrays, sum, product, maximum, minimum of elements Lab – Exercises on two dimensional arrays.	[1] page. 90- 95	Lecture 1 hour Lecture 1 hour Lecture 1 hour Seminars 2 hours Lab 1 hour
VII.	Topic 19 – Pointers and Addresses. Topic 20 – Pointers and Function Arguments Topic 21 – Pointers and Arrays. Seminar - Exercises with pointers Lab – Exercises with pointers	[1] page. 95 – 106	Lecture 1 hour Lecture 1 hour Lecture 1 hour Seminars 2 hours Lab 1 hour



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Week	COURSE TOPICS	Reference Literature	Teaching Methodology
VIII.	Topic 22 – Strings of data Topic 23 – Main operations with string elements Topic 24 – Main operations with string elements and functions Seminar - Exercises with strings Lab – Exercises with strings	[1] page. 106-110	Lecture 1 hour Lecture 1 hour Lecture 1 hour Seminars 2 hours Lab 1 hour
IX.	Topic 25 – Structures. Topic 26 – Basics of Structures. Topic 27 – Structures and Functions Seminar - Exercises with Structures Lab – Exercises with Structures	[1] page. 106-110	Lecture 1 hour Lecture 1 hour Lecture 1 hour Seminars 2 hours Lab 1 hour
X.	Topic 28 – Arrays of Structures. Topic 29 – Pointers to Structures. Topic 30 – Self-referential Structures. Seminar - Exercises with Structures Lab – Exercises with Structures	[1] page. 110-113	Lecture 1 hour Lecture 1 hour Lecture 1 hour Seminars 2 hours Lab 1 hour
XI.	Topic 31 – Table Lookup. Topic 32 – Typedef. Topic 33 – Unions. Seminar - Exercises with Structures Lab – Exercises with Structures	[1] page. 114-121	Lecture 1 hour Lecture 1 hour Lecture 1 hour Seminars 2 hours Lab 1 hour
XII.	Topic 34 – Standard Input and Output. Formatted Output - printf Topic 35 – Variable-length Argument Lists. Formatted Input - Scanf. Topic 36 – File Access Seminar - Exercises on Input and Output. Lab – Exercises with Input and Output.	[1] page. 122-130	Lecture 1 hour Lecture 1 hour Lecture 1 hour Seminars 2 hours Lab 1 hour
XIII.	Topic 37 – Error Handling - Stderr and Exit Topic 38 – Line Input and Output. Topic 39 – Miscellaneous Functions. Random Number generation. Seminar - Exercises on Error Handling Lab – Exercises Error Handling	[1] page. 132-140	Lecture 1 hour Lecture 1 hour Lecture 1 hour Seminars 2 hours Lab 1 hour



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Week	COURSE TOPICS	Reference Literature	Teaching Methodology
XIV.	Topic 40 – Bit Operators. Unary Operators. Multiplicative Operators. Additive Operators. Shift Operators Topic 41 – Bitwise AND Operator. Bitwise Exclusive OR Operator. Bitwise Inclusive OR Operator. Topic 42 Bit Operators . Review Seminar - Exercises on Bit Operators Lab – Exercises Bit Operators	[1] page. 161-170	Lecture 1 hour Lecture 1 hour Lecture 1 hour Seminars 2 hours Lab 1 hour
XV.	Topic 43 - The UNIX System Interface Topic 44 – Example - An implementation of Fopen and Getc. Topic 45 – Example - Listing Directories Seminar - Exercises Lab – Handling labs of students	[1] page 368-386 [1] page 392-413 [1] page. 420-440	Lecture 1 hour Lecture 1 hour Lecture 1 hour Seminars 2 hours Lab 1 hour

KNOWLEDGE ASSESSMENT						
ATTENDANCE		Attendance for lectures and seminars is mandatory at 75%. Otherwise, the student loses the right to take the exam. Absences are the personal responsibility of the student, as are any missed assignments or tests. A student who has less than 75% attendance for the period relevant to any partial exam, during which they will be tested, will not be allowed to take the corresponding exam and will be graded with an M (Missing). If the student has attended the course but does not show up for the next exam, they will be graded NP (Not Present).				
CONTINUOUS ASSESSMENT	Assessment Method	Assessment Time	Learning Topics to be Assessed	Maximum Points	Knowledge Testing Method	Test Content
	Partial Exam	Week 7-8	1-15	25 points	Written exam	Concepts and exercises
	Final Exam	End of the semester	16-45	60 points	Written exam	Concepts and exercises
	Continuous Assessment* (Course Assignment*)	During the semester	-	15 points	Written report and oral presentation	C programming applications, with source code and execution
	* Continuous Assessment – The student will realize a project that will start at the beginning of the semester. Student will bring an application in C programming, with source code and execution.					



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	The conversion of points to the final grade is as follows:						
	0 - 40 points	41 - 50 points	51 - 60 points	61 - 70 points	71 - 80 points	81 - 90 points	91 - 100 points
	4	5	6	7	8	9	10
LITERATURE							
Primary literature	[1] The C programming Language, By Brian W. Kernighan and Dennis M. Ritchie ISBN 0-13-110362-8 [2] “C programming, A modern Approach”, By K.N. King, 978-0-393 - 97950-3						
Recommended literature	1. “A book on C”, by Al Kelley, Ira Pohl, ISBN 0201183994 2. “Learn C The Hard Way”, Zed A. Shaw, ISBN 978-0-321-88492-3						
FINAL REMARKS FROM THE COURSE INSTRUCTOR							
Provisions	Students are expected to develop values and ethics that reflect their interests and behavior from a professional perspective. Students must respect individual differences, be cooperative, and in accordance with ethical rules, they should respect ethnic differences and assist individuals with disabilities with inclusive and supportive attitudes.						
Delays	Delays in lectures and seminars will not be tolerated.						
Academic integrity and copyright	Each test or written work must be completely individual and original. Plagiarism (mixed combinations) or theft of information through various means will not be allowed.						

HEAD OF DEPARTMENT OF COMPUTER SCIENCES
Dr. Alketa HYSO