



### 11. Programming for Engineers (EE057IU)

Course designation	<p><i>This course is aimed at students with no or little programming experiences. Generally, it endeavors to provide students with an understanding about the role of programming that can play in solving problems. The course content thus equips the basic terminologies of principles of programming and data structures via C programming language.</i></p> <p><i>The fundamentals include the history of programming, stepwise refinement and flow-charting, introduction to algorithm analysis; basic data types, type conversion, making decision and looping, branching, I/O operations; functions, recursion; arrays and multiple-subscripted arrays, searching and sorting algorithms; pointers/function pointers; characters and strings; structures, unions, enumerates, operations on bits; introduction to abstract data types; dynamic memory allocation, file processing.</i></p>
Semester(s) in which the course is taught	1, 2, summer semester
Person responsible for the course	Dr. Nguyễn Ngọc Trường Minh
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, project
Workload (incl. contact hours, self-study hours)	<p>(Estimated) Total workload: 127.5</p> <p>Contact hours (please specify whether lecture, exercise, laboratory session, etc.): lecture: 37.5</p> <p>Private study including examination preparation, specified in hours: 90</p>
Credit points/ECTS	3 credits/4.62 ECTS
Required and recommended prerequisites for joining the course	None



Course objectives	The course is designed to provide students with 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.								
Course learning outcomes	<p>Upon the successful completion of this course students will be able to:</p> <p>CLO1: Implement C instructions, data types and programming techniques to solve simple problems</p> <p>CLO2: Use novel computing technology and translate hypothesis as well as solutions into computer programs</p> <p>CLO3: Explain the impact of electrical engineering solutions in a global, economic, environmental and social context</p> <p>CLO4: Use collaboration skill with teammates</p> <p>CLO5: Implement C into systems</p> <table border="1" data-bbox="520 1025 1374 1361"> <thead> <tr> <th data-bbox="520 1025 743 1137">Competency level</th> <th data-bbox="748 1025 1374 1137">Course learning outcome (CLO)</th> </tr> </thead> <tbody> <tr> <td data-bbox="520 1144 743 1218">Knowledge</td> <td data-bbox="748 1144 1374 1218">CLO1, CLO2, CLO3, CLO4, CLO5</td> </tr> <tr> <td data-bbox="520 1225 743 1294">Skill</td> <td data-bbox="748 1225 1374 1294">CLO1, CLO2, CLO3, CLO4, CLO5</td> </tr> <tr> <td data-bbox="520 1301 743 1361">Attitude</td> <td data-bbox="748 1301 1374 1361"></td> </tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	Knowledge	CLO1, CLO2, CLO3, CLO4, CLO5	Skill	CLO1, CLO2, CLO3, CLO4, CLO5	Attitude	
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Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduction); T (Teaching); U (Utilization)</p>		
	<b>Topic</b>	<b>Weight</b>	<b>Level</b>
	Programming Fundamentals & Introduction to Computers and C Programming	1	I
	Algorithm and Flow-Chart	1	I
	Variables, Data Types and Arithmetic Expressions	1	I
	Making Decisions, Branching and Looping	1	U
	I/O Operations in C	1	U
	Working with C Functions/Recursion	1	U
	Working with C Pointers/Pointers to Functions	2	U
	Working with Structures/Unions	2	U
	Working with C Characters	1	U
	Operations on Bits	1	T
	File Processing and Dynamic Memory Allocation	1	T
	Project	2	U
Examination forms	Multiple-choice questions, practical programming exercises		



Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>
Reading list	<p>[1] Paul Deitel and Harvey Deitel, "<i>C How to Program</i>," 8<sup>th</sup> edition, Pearson, 2016</p> <p>[2] Brian Kernighan and Dennis Ritchie, "<i>The C Programming Language</i>," 2<sup>nd</sup> edition, Prentice Hall, 1988</p> <p>[3] Stephen G. Kochan, "<i>Programming in C</i>," 4<sup>th</sup> edition, Sams Pub., 2014</p>