National University of Sciences & Technology (NUST)
School of Electrical Engineering and Computer Science (SEECS)
Department of Electrical Engineering

Fundamentals of Programming

Course Code:	CS-114	**Semester:**	Fall 2020
Credit Hours:	2+1	**Prerequisite Course:**	None
Instructor:	Taha Ali	**Discipline:**	EE
Office:	Room# A-215, SEECS	**Telephone:**	(0)51 9085 2117
Lecture Days:	Wednesday/Friday	**E-mail:**	taha.ali@seecs.edu.pk
Class Room:	CR6/7	**Consulting Hours:**	Wednesday: 2-3 pm
Knowledge Group:	Programming	**Updates on LMS:**	Regular
Lab Engineer:	Ms. Sadia Amir	**Email:**	taha.ali@seecs.edu.pk

Course Description:

The objective of this course is to equip students with fundamental programming skills. Emphasis will be placed on thinking 'algorithmically', i.e. students will learn general programming concepts and apply them to solve basic problems in engineering and mathematics.

We will be using the C programming language.

Text Book:
- C Programming: A Modern Approach (2nd Ed.) by K. N. King

Reference Books:
- C: How to Program (7th Ed.) by P. J. Deitel and H. M. Deitel

Course Website:
- This course will be managed through the SEECS' Moodle Learning Management System (LMS).

Course Learning Outcomes (CLOs):		
At the end of the course the students will be able to:	**PLO**	**BT Level***
1. Describe the fundamental programming constructs and articulate how they are used to develop a program with a desired runtime execution flow	1	C-2
2. Develop programs to implement computer-based solutions of well-specified problems	2	C-1, C-2
3. Distinguish the advantages and limitations resulting from the use of different language constructs that embody similar programming concepts	4	C-6
4. Articulate whether computer programs fit in the provision of computer-based solutions to real-world problems	3	C-3
* BT= Bloom's Taxonomy, C=Cognitive domain, P=Psychomotor domain, A= Affective domain		

Main Topics to be Covered:
Topic 0 –Course Introduction ▪ Algorithms, flow charts, pseudo code ▪ Programming languages ▪ Introduction to C
Topic 1 – Fundamentals of C ▪ Elements of a simple program ▪ Variables and assignments ▪ Input and output functions ▪ Basic syntax
Topic 2 – Expressions ▪ Arithmetic operators ▪ Assignment operators ▪ Increment and decrement operators
Topic 3 – Selection Statements ▪ Logical Expressions ▪ if/switch statements ▪ while statement ▪ for statement
Topic 4 – Types ▪ Basic types ▪ Arrays
Topic 5 – Functions ▪ Defining and calling functions ▪ Arguments ▪ Termination ▪ Recursion
Topic 6 – Pointers ▪ Pointer variables ▪ Address and indirection operators ▪ Pointer assignment ▪ Pointers as arguments
Topic 7 – Embedded Systems ▪ Graphical programming ▪ LEGO Mindstorms ▪ Raspberry Pi

Weightages:	
THEORY	
Assignments:	10%
Project:	10%
Mid Semester Exam:	30%
Final Exam:	50%
PRACTICAL	
Lab Work:	100%

Resources:	
	The class will be conducted in hybrid mode. For those accessing the class online, the MS Teams links are as follows:
Sec. C:	https://teams.microsoft.com/l/team/19%3a1f4bed3a13604b8cb784e55c1cd96493%40thread.tacv2/conversations?groupId=662522aa-7edf-4de0-9113-c60accb64e3b&tenantId=1511ab2e-502b-4e2d-bd68-f679f549b5a2
Sec. D:	https://teams.microsoft.com/l/team/19%3a8b43c33e943a4444a25153a309905c5c%40thread.tacv2/conversations?groupId=4c8a9916-d517-474c-b201-5c49c9a7d5f5&tenantId=1511ab2e-502b-4e2d-bd68-f679f549b5a2
Grading Policy:	
Quiz Policy:	• There will be no quizzes.
Assignment Policy:	• In order to give practice and comprehensive understanding of subject, home assignments will be given. • All assignments will count towards the total (No 'best-of' policy). The students are advised to do the assignment themselves. Copying is highly discouraged and taken as cheating case and will be forwarded for disciplinary action. The questions in assignment are more challenging to give students the confidence and extensive knowledge about the subject and enable them to prepare for the exams.
Plagiarism:	• SEECS maintains a strict no-tolerance plagiarism policy that applies for quizzes, assignments, exams and any other assessment tools. • While collaboration in this course is highly encouraged, you must ensure that you do not claim other people's work/ idea as your own. Plagiarism occurs when the words, ideas, assertions, theories, figures, images, programming codes of others is presented as your own work. • Failing to comply with the SEECS plagiarism policy will lead to strict penalties including zero marks in assignments and report to the academic coordination office for disciplinary action.