



Course	Computer Skills for Engineers – 0907101 (3 Cr. – Core Course)
Catalog Description	Elementary programming, primitive data types, assignments and expressions, control flow statements, loops, functions, arrays, pointers, strings, libraries, objects, classes, and problem-solving.
Prerequisites by Course	Basics of Computing 1932099
Prerequisites by Topic	Students are assumed to have basic understanding of binary number systems and how computers work.
Textbooks	<ol style="list-style-type: none">1. Y. Daniel Liang, Introduction to Programming with C++, 3rd Edition, Pearson, 20142. Jake VanderPlas, A Whirlwind Tour of Python, O'Reilly, 2016
Additional References	<ol style="list-style-type: none">3. D. S. Malik, C++ Programming: From Problem Analysis to Program Design, 8th edition, Cengage Learning, 20174. P. Deitel and H. Deitel, C++ How to Program, 10th edition, Pearson, 2017
Course Website	http://cpe-exam.ju.edu.jo/
Schedule & Duration	15 weeks: 45 lectures, 50 minutes each / 30 lectures, 75 minutes each
Student Material	Textbook, class handouts, lecture notes, and any additional reading assigned by the instructor, lecture videos during online learning
College Facilities	Classroom with whiteboard and projector, and computer laboratory with internet access, account on http://cpe-exam.ju.edu.jo/
Course Objectives	The objectives of this course are to help students to: <ol style="list-style-type: none">1. Explain basic elements in programming, such as statements, expressions, control flow, loops, functions, and recursion.2. Explain basic elements in object-oriented programming such as objects, classes, and constructors.3. Use pointers and arrays to create data structures.4. Analyze, write, debug and test C++ and Python programs.5. Develop C++ and Python programs to solve engineering problems.
Course Outcomes and Relation to ABET Program Outcomes	Upon successful completion of this course, a student should be able to: <ol style="list-style-type: none">1. Apply knowledge of mathematics and engineering in writing computer programs [1].2. Solve engineering problems using C++ and Python programming [1].

Course Topics

1. Introduction to Computers, Programs, and C++ (Sections 1.1-3, 1.6-9) [1 lecture]
2. Elementary Programming (Sections 2.1-13, 2.15, 2.16) [3 lectures]
3. Selections (Sections 3.1-3.16) [3 lectures]
4. Mathematical Functions, Characters and Strings (Sections 4.1-11) [2 lectures]
5. Loops (Sections 5.1-6, 5.9) [3 lectures]
6. Functions (Sections 6.1-13) [3 lectures]
7. Single-Dimensional Arrays and C-Strings (Sections 7.1-7, 7.11) [3 lectures]
8. Multi-Dimensional Arrays (Sections 8.1-5, 8.8) [3 lectures]
9. Recursion (Sections 17.1-2) [1 lecture]
10. Objects and Classes (Sections 9.1-6, 9.9) [2 lectures]
11. Pointers (Sections 11.1-2, 11.5-7) [3 lectures]
12. Python Basics, Types, Operators, Control Flow, Functions, and Objects (Textbook 2) [2 lectures]
13. Important Python Packages: NumPy, Pandas, Matplotlib, and SciPy (Textbook 2) [2 lectures]

Computer Usage

The practical aspects of the course will be covered by problem-solving programming assignments and practical exams.

Policies

- **Attendance is mandatory and required. Class attendance will be taken every class and the university's policies will be enforced in this regard.**
- **Students are not allowed to move between any of the seven sections.**
- **Personal excuses are not accepted and will be counted towards the absence limit (15% of the total number of classes).**
- It is required to study the specified sections of the textbooks and solve selected exercises at the end of the chapter in order to gain programming experience.
- Solving the programming assignments by yourself is necessary to pass the midterm and final exams.
- **All submitted work must be yours. Cheating will not be tolerated. We will select random assignments and check them for plagiarism, and we will change your mark to zero for these assignments due to cheating at any time during the semester. The same applies to exams. We will apply JU policies and regulations in this regard.**
- Join the MS Teams group of this course.

Grading policy

Programming Assignments	20%
Practical Midterm Exam	30%
Practical Final Exam	50%

Instructors

Instructor	Contact Information	Office Hours
Dr. Waleed Dweik (Coordinator)	Email: dweik@ju.edu.jo	In-Person Office Hours: To be determined later. Online: Weekdays from 8:00 A.M. to 4:00 P.M.
Dr. Samah Rahamneh	Email: s.rahamneh@ju.edu.jo	
Eng. Saadeh Sweidan	Email: s.sweadan@ju.edu.jo	

Class Time and Location

Section	Professor	Days	Time
Section 1	Eng. Saadeh Sweidan	Su/Tu/Th	8:30 - 9:30
Section 2	Dr. Samah Rahamneh	Su/Tu/Th	9:30 - 10:30
Section 3	Eng. Saadeh Sweidan	Su/Tu/Th	10:30 - 11:30
Section 4	Dr. Waleed Dweik	Su/Tu/Th	11:30 - 12:30
Section 5	Eng. Saadeh Sweidan	M/W	8:30 - 10:00
Section 6	Dr. Samah Rahamneh	M/W	11:30 - 1:00
Section 7	Dr. Waleed Dweik	Su/Tu/Th	12:30 - 1:30

Last UpdatedFeb. 24th, 2023**Program
Outcomes (PO)**

1	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2	an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3	an ability to communicate effectively with a range of audiences
4	an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5	an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6	an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7	an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.