

Ministry of Higher Education and Scientific Research

Supervision and Scientific Evaluation Department

Quality Assurance and Academic Accreditation Office

Computer Fundamentals and Programming Course Description

The template provides a summary of the main course features and expected student learning outcomes.

1. Educational Institution	Shatt Al-Arab University
2. Department / Center	Department of Laser and Optoelectronics Engineering
3. Course Title /Code	Computer Fundamentals and Programming/ ATU15014
4. Lecturer Name	Dhuha Habeeb Mtashar
5. Type of Teaching	Attendance
6. Academic Year /Term	Term
7. Total No. of Teaching Hours	75
8. Date of Preparing this Course Description	30/7/2025

1. Course Objectives

1. the student gets acquainted with the basic computer components in general
2. Get to know the basic operating systems such as Windows.
3. Get to know some printing and display programs such as Word and Power Point.
4. Learn about the concept of networks, the concept of the Internet, and knowledge of search engines.
5. Learn about the MATLAB application as it is one of the important applications.

2. Course Output, Methodology and Evaluation

(A) Cognitive Objectives

- Define operating systems and their basic functions.
- Understand the use of Office applications (Word, Excel, PowerPoint) for document creation and presentations.
- Grasp the concepts of computer networks, the Internet, and search engines.
- Familiarize with the MATLAB environment and the roles of its main windows.

(B) Skill Objectives Related to the Program:

- By the end of the course, the student will be able to power the computer on and off, log in securely, and organize files and folders within the Windows environment. They will confidently create and format documents in Word and craft professional presentations in PowerPoint. In Excel, they will build spreadsheets, apply formulas and functions, and generate basic charts. Finally, the student will execute MATLAB commands and develop simple scripts to perform arithmetic operations on matrices.

(C) Methods of Teaching and Learning

- The course uses brief interactive lectures, hands-on labs with live software demos, self-paced tutorials, and quick quizzes/projects for continuous feedback.

(D) Methods of Evaluation

- **Oral Tests:** Assessing students' understanding through verbal responses.
- **Monthly Tests:** Evaluating students' knowledge and progress on a monthly basis.
- **Daily Quizzes:** Regular quizzes to gauge students' grasp of material covered each day.
- **Regular Attendance:** Monitoring and evaluating students' consistent participation in classes.

(E) Sentimental and Value Objectives

- **Ethical Understanding:** Promoting respect, integrity, and social responsibility.
- **Attitudes and Values:** Fostering positive attitudes towards learning, collaboration, and ethical behavior.

(F) General and Qualitative Skills (other skills related to the ability of employment and personal development)

- Develop students' leadership skills.
- • Improve students' proficiency in presenting technical information, writing reports, and explaining results.
- • Develop students' technical skills through their participation in practical experiments related to Computer Fundamentals and Programming.
- • Encourage students to adapt to new technologies and methodologies related Computer Fundamentals and Programming.

3. Course Structure

Week	No of Hours	Required Learning Output	Title of Subject	Teaching Method	Evaluation
١		• Defines an operating system and its core functions. • Identifies key features of Windows 95 through Windows 10. • Explains the difference between an operating system and application software. • Safely powers a computer on and off. • Navigates the desktop using a mouse and its buttons. • Describes how operating system features enhance performance and usability.	Fundamentals of Operating Systems and Computer Operation	Lectures and discussions	Oral tests and questions
٢		• Navigate the desktop environment and use the Start	Desktop Navigation, Hardware–Software Interaction, and	Lectures and discussions	Oral tests and questions

		button effectively. • Launch, switch, and manage applications via the taskbar. • Differentiate between hardware and software, outlining their roles and interrelationships. • Explain how hardware influences operating systems and applications—and vice versa. • Describe the purpose of software updates, security practices, and bug management. • Apply core principles of software ethics in everyday computing.	Software Ethics		
۳		• Create, format, and edit text documents using Microsoft Word. • Apply styles, tables, and review features to produce professional Word documents. • Build and manipulate Excel spreadsheets with formulas, functions, and basic data analysis. • Generate charts, pivot tables, and data visualizations in Excel.	Microsoft Office Applications: Word, Excel, and PowerPoint	Lectures and discussions	Oral tests and questions

		• Develop PowerPoint presentations with slide layouts, animations, and multimedia elements. • Collaborate and share Office files using review tools and cloud integration.			
4		• Define computer networks and differentiate between LAN, WAN, and other network types. • Explain the architecture and operation of the Internet. • Describe the main screen components of a web browser interface. • Demonstrate how to establish a connection to the World Wide Web. • Use popular search engines (e.g., Google, Yahoo) to locate online content. • Apply search techniques to access, evaluate, and retrieve relevant information.	Fundamentals of Computer Networks, Internet Connectivity, and Information Retrieval	Lectures and discussions	Oral tests and questions
5		• Define the purpose and capabilities of MATLAB as a	Introduction to MATLAB Environment and	Lectures and discussions	Oral tests and questions

		numerical computing environment. • Describe the layout and components of the MATLAB desktop. • Execute commands and view outputs in the Command Window. • Manage variables and data using the Workspace Window. • Navigate through past commands in the Command History Window. • Access documentation and examples via the Help Window. • Create, edit, and run scripts and functions in the Editor Window.	User Interface		
٦		• Write and run a simple MATLAB script using expressions and constants. • Create and manipulate matrices via manual entry and built-in generators. • Index and modify matrices with subscripting, the end keyword, and the colon operator. • Perform matrix operations such as transpose and deletion of	Basic MATLAB Programming and Matrix Manipulation	Lectures and discussions	Oral tests and questions

		rows/columns.			
Y		• Implement conditional logic using if, else, and elseif statements. • Automate tasks with for and while loops. • Write, save, and call user-defined functions with input/output arguments. • Organize MATLAB code into scripts and function files for modularity and reuse.	Control Flow and Function Development in MATLAB	Lectures and discussions	Oral tests and questions
A		• Create and initialize numeric arrays of various dimensions. • Access, modify, and slice array elements using indexing and the colon operator. • Reshape, concatenate, and split arrays with built-in functions. • Perform element-wise and matrix arithmetic on arrays. • Query array properties (size, length, ndims) and adjust dimensions as needed.	Array Creation and Manipulation in MATLAB.	Lectures and discussions	Oral tests and questions
9		• Create and initialize cell arrays for storing	Cell Arrays and Structures in MATLAB	Lectures and discussions	Oral tests and questions

		heterogeneous data. • Access and modify cell array elements using curly-brace and parentheses indexing. • Define structures with named fields and assign or retrieve field values. • Organize data into arrays of structures for complex record management. • Convert between standard arrays, cell arrays, and structures for flexible data handling. • Use cellfun and structfun to apply functions across cell arrays and structures.			
1.		• Perform element-wise addition, subtraction, multiplication, and division on matrices. • Execute standard matrix multiplication and power operations. • Apply dot-operators (.*, ./, .^) for element-wise computations. • Compute the determinant and inverse of square matrices.	Matrix Arithmetic Operations in MATLAB	Lectures and discussions	Oral tests and questions

		• Validate dimensional compatibility and troubleshoot arithmetic errors.			
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4. Lab Structure

Week	No of Hours	Materials Covered
၁		Operating system
၂		Microsoft word
၃		Power point
၄		Introduction of matlab
၅		Function in matlab
၆		Array in matlab
၇		Arithmetic operations on matrices in matlab

5. Learning and Teaching Resources

Textbooks	1. Silberschatz, A., Galvin, P. B., & Gagne, G. (1999). Applied operating system concepts. John Wiley & Sons, Inc. 2. Moore, H. (2012). MATLAB for Engineers.
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6. Course Improvement Plan

• Updating and expanding the curriculum content to include modern developments and applications related to Computer Fundamentals and Programming.
