

Department of Medical Physics – Computer Applications Course – Theoretical Component

First Semester 2025

Course Description - Theoretical Component

College: Al-Zahrawi University College - Department of Medical Physics Engineering

Course Name: Computer Applications

Units: 3

Theoretical Hours: 2 hours per week

Language of Instruction: English

Instructor: Asst. Lecturer Hussein Abdulali Al-Saadi

General Objectives (Theoretical Component – Computer Applications)

This course is designed to equip medical physics students with essential computer knowledge and theoretical understanding of practical applications relevant to their field. By the end of the course, students will be able to:

- Identify the main components of a computer system, including input/output devices and storage units.
- Understand the differences between hardware and software, and explain their roles in system operation.
- Describe the types of software: system software, application software, and programming tools.
- Recognize the structure and functions of modern operating systems (e.g., Windows, macOS, Linux).
- Understand basic desktop operations: creating folders, managing files, and switching input languages.
- Explore the Microsoft Word interface and apply basic formatting, editing, and saving techniques.
- Comprehend the structure and features of Microsoft Excel, including:
 - Working with cells and ranges
 - Using built-in functions (e.g., SUM, AVERAGE, IF, COUNT)
 - Applying formulas and logical operators
 - Creating and interpreting charts
- Appreciate the role of computer applications in healthcare, education, and scientific research.

Weekly Study Plan – Theoretical Component (Computer Applications)

Week	Topic
Week 1	Introduction to Computer Science – Definition, importance, and applications in medical physics
Week 2	Computer Components: Hardware – Input, Output, Processing, and Storage Devices
Week 3	Software Types: System Software, Application Software, and Programming Tools
Week 4	Operating Systems: Windows and Linux – Features, Functions, and File Management
Week 5	Midterm Exam (Theoretical)
Week 6	File Operations in Windows: Creating folders, Copying, Moving, Deleting, and Language Switching
Week 7	Introduction to Microsoft Word – Interface, Basic Tools, Opening, Saving, and Formatting
Week 8	Midterm Exam (Practical)
Week 9	Advanced Word Tools: Bullets, Tables, and Inserting Images
Week 10	Introduction to Microsoft Excel – Cells, Columns, Rows, and the Difference Between Formulas and Functions
Week 11	Basic Excel Functions: SUM, AVERAGE, IF, COUNT
Week 12	Logical Formulas and Conditional Operations, Creating Charts
Week 13	Applications of Excel in Medical Physics: Data Analysis, Reporting, and Patient Info Management
Week 14	Final Exam (Practical)
Week 15	Final Exam (Theoretical)

Module Evaluation

The final grade for this course is based on a total of **100 marks**, distributed as follows:

A. Coursework (50 Marks)

Component	Frequency	Mark per Attempt	Weight
Quizzes	3 times	10 marks	10 marks
Reports	3 times	25 marks	10 marks
Home Assignments	3 times	25 marks	10 marks
Laboratory Assessment	1 time	25 marks	5 marks
In-Class Participation (College Tasks)	2 times	10 marks	5 marks
Midterm Exam (Theoretical)	1 time	10 marks	10 marks

Subtotal: 50 Marks

B. Final Examination (50 Marks)

Component	Weight
Final Practical Exam	20 marks
Final Theoretical Exam	30 marks

Subtotal: 50 Marks

Recommended References

- 1. Introduction to Computers and Information Technology**
Author: Emergent Learning
Publisher: Cengage Learning, Latest Edition
→ Covers fundamentals of computer hardware, software, operating systems, and applications.
- 2. Microsoft Office 365: In Practice – Word, Excel**
Author: Randy Nordell
Publisher: McGraw-Hill Education
→ A practical guide for learning Word and Excel in academic and professional settings.
- 3. Computer Fundamentals**
Author: Anita Goel
Publisher: Pearson Education
→ Explains computer concepts in a simple, structured way suitable for medical and non-technical students.

Relation to Other Courses

This course lays the foundation for several advanced and practical subjects within the Medical Physics program. It supports:

- **Biostatistics:** by providing skills in Excel for data entry, statistical calculations, and charting.
- **Medical Research Methods:** through Word and Excel proficiency for report writing and data organization.
- **Radiology and Imaging Systems:** by introducing computer components relevant to imaging devices and digital processing.
- **Instrumentation and Device Maintenance:** through understanding of file systems, operating environments, and troubleshooting basics.