澳門理工大學
Universidade Politécnica de Macau
Macao Polytechnic University

FACULTY OF APPLIED SCIENCES

BACHELOR OF SCIENCE IN COMPUTING

LEARNING MODULE OUTLINE

Academic Year	2024/2025	Semester	1
Module Code	COMP314		
Learning Module	Human Factors and User Interfaces		
Pre-requisite(s)	Nil		
Medium of Instruction	English		
Credits	3	Contact Hours	45 hrs
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MODULE DESCRIPTION

This module applies the basic principles of human-computer interaction to the design of computer interfaces. It also looks at the analysis of interface design and system integration problems. Comparison of standard graphical user interfaces (GUI) and the application of guidelines for windows, menus, and other dialogue techniques is dealt with. Students will evaluate the usability of the program interfaces and compare interface design methodologies.

MODULE INTENDED LEARNING OUTCOMES (ILOS)

On completion of this learning module, students will be able to:

M1.	Conclude key issues in interface design; (EA1p, EP7p)
M2.	Illustrate the human components functions regarding interaction with computer; (EA1p, EP7p)
M3.	Illustrate computer components functions regarding interaction with human; (EA1p, EP7p)
M4.	Apply the guidelines, principles, theories, and methodologies to user interface design; (EA1p, D1p, D4p, D5p, EP7p)
M5.	Select and apply proven methods, tools and techniques in the design. (EA1p, D1p, D4p, D5p, EP7p)

These ILOs aims to enable students to attain the following Programme Intended Learning Outcomes (PILOs):

PILOs		**M1**	**M2**	**M3**	**M4**	**M5**
P1.	Select and apply proven methods, tools and techniques to the effective and efficient implementation of information systems;					
P2.	Evaluate computer systems in a local area network, and understand the additional requirements for connection to other networks through wide area networks;					

P3.	Be competent in system development in the Internet and the web platform;					
P4.	Work independently to design and implement a relational database, with an emphasis on how to organise, maintain and retrieve information from a DBMS;					
P5.	Acquire essential knowledge in specific fields of computing disciplines including multimedia, security and artificial intelligence;					
P6.	Acquire the perceptive skills needed to understand information presented in the form of UML diagram, flow chart or other industry standard formats;	✓				
P7.	Understand the need for and use of the necessary mathematical techniques;		✓	✓		
P8.	Work independently to develop an understanding of, and the knowledge and skills associated with the general support of computer systems and networks;				✓	✓
P9.	Work as an effective member of a team in the analysis, design and development of software systems;					
P10.	Use project planning and management techniques in systems development;					
P11.	Understand the fundamental and operational issues of computer systems in business environments;					
P12.	Equip with adequate written, oral communication and interpersonal skills;					
P13.	Build the capacity and desire for lifelong learning and to learn advanced and emerging technologies on one's own;					
P14.	(For Enterprise Information Systems specialisation) Gain an in-depth understanding of the information technology related to enterprise information systems, with an emphasis on development of such systems to support business processes;					
P15.	(For Gaming Technology specialisation) Acquire the general and advanced knowledge of current technologies and operating environment in the gaming industry;					
P16.	(For Computer Education specialization) Acquire the general and practical knowledge of computer education and its practicing environment in secondary education.					

MODULE SCHEDULE, COVERAGE AND STUDY LOAD

Week	Content Coverage	Contact Hours
1	1. Usability of Interactive Systems	3
	1.1. Introduction	
	1.2. Usability Goals and Measures	
	1.3. Usability Motivations	
	1.4. Goals for Our Profession	
2	2. Universal Usability	3

	2.1. Variations in physical abilities &physical workplaces	
	2.2. Diverse cognitive and perceptual abilities	
	2.3. Personality differences	
	2.4. Cultural and international diversity	
	2.5. Users with disabilities	
	2.6. Older adult users	
	2.7. Children	
	2.8. Accommodating hardware and software diversity	
3-4	3. Guidelines, Principles, and Theories	6
	3.1 Guidelines	
	3.2 Principles	
	3.3. Theories	
	3.4. Mental Models in HCI	
5	4. Design	3
	4.1. Organizational Support for Design	
	4.2. The Design Process	
	4.3. Design Frameworks	
	4.4. Design Methods	
	4.5. Design Tools, Practices, and Patterns	
	4.6. Social Impact Analysis	
	4.7. Legal Issues	
6-7	5. Evaluation and the User Experience	4.5
	5.1. Expert Reviews and Heuristics	
	5.2. Usability Testing and Laboratories	
	5.3. Survey Instruments	
	5.4. Acceptance Tests	
	5.5. Evaluation During Active Use and Beyond	
	5.6. Controlled Psychologically Oriented Experiments	
7-8	6. Direct Manipulation and Immersive Environments	3

	6.1. What is Direct Manipulation?	
	6.2. Some examples of Direct Manipulation	
	6.3. 2D and 3D Interfaces	
	6.4. Teleoperation and Presence	
	6.5. Augmented and Virtual Augmented Reality	
8-9	7. Fluid Navigation	4.5
	7.1. Navigation by selection	
	7.2. Small displays	
	7.3. Content Organization	
	7.4. Audio menus	
	7.5. Form fill-in and dialog boxes	
10	8. Expressive Human and Command Languages	3
	8.1. Speech recognition	
	8.2. Speech production	
	8.3. Human language technology	
	8.4. Traditional command languages	
11-12	9. Devices	4.5
	9.1. Keyboards and Keypads	
	9.2. Pointing Devices	
	9.3. Displays	
12-13	10. Advancing the User Experience	4.5
	10.1. Display Design	
	10.2. View (Window) Management	
	10.3. Animation	
	10.4. Web Page Design	
	10.5. Color	
	10.6. Nonanthropomorphic Design	
	10.7. Error Messages	
14	11. Information Search	3

	11.1. Five-phase search framework	
	11.2. Dynamic queries and faceted search	
	11.3. Command languages and “natural” language queries	
	11.4. Multimedia Document Search & specialized search	
	11.5. The Social aspects of search	
15	12. Data Visualization	3
	12.1. Tasks in Data Visualization	
	12.2. Visualization by Data Type	
	12.3. Challenges for Data Visualization	

TEACHING AND LEARNING ACTIVITIES

In this learning module, students will work towards attaining the ILOs through the following teaching and learning activities:

Teaching and Learning Activities	**M1**	**M2**	**M3**	**M4**	**M5**
T1. Lectures	✓	✓	✓	✓	✓
T2. In-class exercises		✓		✓	✓

ATTENDANCE

Attendance requirements are governed by the Academic Regulations Governing Bachelor’s Degree Programmes of the Macao Polytechnic University. Students who do not meet the attendance requirements for the learning module shall be awarded an ‘F’ grade.

ASSESSMENT

In this learning module, students are required to complete the following assessment activities:

Assessment Activities	**Weighting (%)**	**AHEP3 LOs**	**ILOs to be Assessed**
A1. Assignments	20%	EA1p, D1p, D4p, D5p, EP7p	M2, M3, M4, M5
A2. Test	30%	EA1p, D1p, EP7p	M1, M2, M3, M4, M5
A3. Examination	50%	EA1p, D1p, EP7p	M1, M2, M3, M4, M5

The assessment will be conducted following the University’s Assessment Strategy (see www.mpu.edu.mo/teaching_learning/en/assessment_strategy.php). Passing this learning module indicates that students will have attained the ILOs of this learning module and thus acquired its credits.

Students with an overall score of less than 35 in the coursework must take the re-sit examination even if the overall score for the module is 50 or above.

Students with a score of less than 35 in the final examination must take the re-sit examination even if the overall score for the module is 50 or above.

Students with an overall final grade of less than 35 are NOT allowed to take the re-sit examination.

REQUIRED READINGS

1. Shneiderman, B., & Plaisant, C. (2016). *Designing the User Interface: Strategies for Effective Human-Computer Interaction* (6th edition). Pearson.

REFERENCES

1. Olsen, D. (2010). *Building Interactive Systems - Principles for Human-Computer Interaction* (1st edition). Cengage
2. Sharp, H., Rogers, Y., & Preece, J. (2015). *Interaction Design: Beyond Human-Computer Interaction* (4th edition). Wiley

STUDENT FEEDBACK

At the end of every semester, students are invited to provide feedback on the learning module and the teaching arrangement through questionnaires. Your feedback is valuable for instructors to enhance the module and its delivery for future students. The instructor and programme coordinators will consider all feedback and respond with actions formally in the annual programme review.

ACADEMIC INTEGRITY

The Macao Polytechnic University requires students to have full commitment to academic integrity when engaging in research and academic activities. Violations of academic integrity, which include but are not limited to plagiarism, collusion, fabrication or falsification, repeated use of assignments and cheating in examinations, are considered as serious academic offenses and may lead to disciplinary actions. Students should read the relevant regulations and guidelines in the Student Handbook which is distributed upon the admission into the University, a copy of which can also be found at www.mpu.edu.mo/student_handbook/.