



FACULTY OF APPLIED SCIENCES
BACHELOR OF SCIENCE IN COMPUTING
LEARNING MODULE OUTLINE

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|-----------------------|-----------------------------------|---------------|-----------------|
| Academic Year | 2025/2026 | Semester | 1 |
| Module Code | COMP3115 | | |
| Learning Module | Human Factors and User Interfaces | | |
| Pre-requisite(s) | Nil | | |
| Medium of Instruction | English | | |
| Credits | 3 | Contact Hours | 45 hrs |
| Instructor | Wilson Ho | Email | kcho@mpu.edu.mo |
| Office | A216, Chi-Un building | Office Phone | 85996586 |

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:

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| M1. | Conclude key issues in interface design; (C2, C14) |
| M2. | Illustrate the human components functions regarding interaction with computer; (C2, C14) |
| M3. | Illustrate computer components functions regarding interaction with human; (C2, C14) |
| M4. | Apply the guidelines, principles, theories, and methodologies to user interface design; (C2, C5, C11, C14) |
| M5. | Select and apply proven methods, tools and techniques in the design. (C2, C5, C14) |

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 on common platforms, including the Internet platform; | | | | | |
| P2. Acquire essential knowledge in specific fields of computing disciplines including networking, artificial intelligence and security; | | | | | |



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| P3. | Apply necessary mathematical techniques to model, analyse and devise solutions to complex problems; | | ✓ | ✓ | ✓ | ✓ |
| P4. | Work independently to develop an understanding of, and the knowledge and skills associated with the general support and mitigation of security risks of computer systems and networks; | | | | ✓ | ✓ |
| P5. | Design and implement relational database, with an emphasis on how to organise, maintain, retrieve and analyse information; | | | | | |
| P6. | Distinguish the fundamental and operational issues of computer systems, with considerations of user, business, ethical, societal and environmental needs; | | | | | |
| P7. | Evaluate, prepare and communicate effectively on technical information to both technical and non-technical audience; | ✓ | ✓ | ✓ | ✓ | ✓ |
| P8. | Work as an effective member of a team in the analysis, design and development of software systems, with recognition of requirement to support equality, diversity and inclusion; | | | | | |
| P9. | Use project planning, risk management and quality management techniques in solutions to complex problems; | | | | | |
| P10. | Build the capacity and desire for lifelong learning and to learn advanced and emerging technologies on one's own; | | | | | |
| P11. | (For Business Intelligence specialization) Gain an in-depth knowledge of technologies related to data analysis and management of information to support business processes in enterprises; | | | | | |
| P12. | (For Gaming Technology specialization) Acquire the general and advanced knowledge of current technologies and operating environment for the development of the gaming and tourism industry; | | | | | |
| P13. | (For Computer Education specialization) Acquire 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 | |



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| | 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 | |



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| | 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 | |



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| | 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 (%) | AHEP4 LOs | ILOs to be Assessed |
|-----------------------|---------------|------------------|---------------------|
| A1. Assignments | 25% | C2, C5, C11, C14 | M2, M3, M4, M5 |
| A2. Test | 25% | C2, C5, C14 | M1, M2, M3, M4, M5 |
| A3. Examination | 50% | C2, C5, C14 | 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/.