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 | 2 |
| Module Code | COMP422 | | |
| Learning Module | Ethics and Professional Issues in Computing | | |
| Pre-requisite(s) | Nil | | |
| Medium of Instruction | English | | |
| Credits | 3 | Contact Hours | 45 hrs |
| Instructor | Shirley Weng In Siu | Email | shirleysiu@mpu.edu.mo |
| Office | M543, Meng Tak Building, Main Campus | Office Phone | 8599-3285 |

**MODULE DESCRIPTION**

This module provides an overview of ethical theories and problems encountered by IT professionals in today's computing environments. Stimulating issues in artificial intelligence, social networking, government surveillance, and intellectual property from different views are discussed. This module challenges students to think critically and draw their own conclusions, which ultimately prepare them to become responsible, ethical users of future technologies.

**MODULE INTENDED LEARNING OUTCOMES (ILOS)**

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

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| M1. | Identify the milestones in computing, networking and artificial intelligence which served as catalysts for change in the society; (SM1p) |
| M2. | Compare and contrast different ethical theories; (ET5p) |
| M3. | Demonstrate the knowledge of ethical issues in intellectual property, privacy, computer and network security, professional ethics, and artificial intelligence; (ET1p, EP5p, EP6p) |
| M4. | Analyse the phenomena of diversity, equity and inclusion in computing and artificial intelligence. (ET5p) |
| M5. | Explain the concepts and discover the implementations of IT in sustainability. (ET4p) |

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; | | | | | |

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| 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 specialization) 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 specialization) 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. Catalysts for Change** | 3 |
| | 1.1 Milestones in Computing | |
| | 1.2 Milestones in Networking | |
| | 1.3 Milestones in Information Storage and Retrieval | |
| | 1.4 Information Technology Issues | |
| 2-4 | **2. Introduction to Ethics** | 9 |

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|---|---|---|
| | 2.1 Subjective Relativism | |
| | 2.2 Cultural Relativism | |
| | 2.3 Divine Command Theory | |
| | 2.4 Ethical Egoism | |
| | 2.5 Kantianism | |
| | 2.6 Act Utilitarianism | |
| | 2.7 Rule Utilitarianism | |
| | 2.8 Social Contract Theory | |
| | 2.9 Virtual Ethics | |
| | 2.10 Comparing Workable Ethical Theories | |
| 5-6 | **3. Networked Communications** | 6 |
| | 3.1 Email and Spam | |
| | 3.2 Social Media and Online Advertising | |
| | 3.4 Censorship | |
| | 3.5 Freedom of Expression | |
| | 3.3 Children and Inappropriate Content | |
| | 3.4 Breaking Trust | |
| | 3.5 Internet Addiction | |
| 7 | **Midterm Test** | 3 |
| 8-9 | **4. Intellectual Property** | 6 |
| | 4.1 Plagiarism | |
| | 4.2 Intellectual Property Rights | |
| | 4.3 Protecting Intellectual Property | |
| | 4.4 Fair Use | |
| | 4.5 Peer-to-Peer Networks | |
| | 4.6 Protections for Software | |
| | 4.7 Open-Source Software | |
| | 4.8 Creative Commons | |
| 10 | **5. Information Privacy** | 3 |

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|---|---|---|
| | 5.1 Perspectives on Privacy | |
| | 5.2 Information Disclosures | |
| | 5.3 Data Mining | |
| | 5.4 Examples of Consumer or Political Backlash | |
| 11 | **6. Ethics of AI** | 3 |
| | 6.1 Biases of AI | |
| | 6.2 AI Ethics | |
| | 6.3 AI and Intellectual Property | |
| | 6.4 Ethical Guidelines for the Use of AI | |
| 12 | **7. Cybersecurity** | 3 |
| | 7.1 Hacking | |
| | 7.2 Malware | |
| | 7.3 Cyber Attacks | |
| | 7.4 Cybersecurity and National Security | |
| 13 | **8. Computer Reliability** | 3 |
| | 8.1 Data-Entry or Data-Retrieval Errors | |
| | 8.2 Notable Software System Failures | |
| | 8.3 Vehicles Automation and Failure Incidents | |
| | 8.4 Computer Simulations | |
| | 8.5 Software Engineering | |
| | 8.6 Software Warranties and Vendor Liability | |
| 14 | **9. Professional Ethics** | 3 |
| | 9.1 Computer Professions | |
| | 9.2 Software Engineering Code of Ethics | |
| | 9.3 Analysis of the Code | |
| 15 | **10. Technologies and the Future** | 3 |
| | 10.1 Automation and Unemployment | |
| | 10.2 Workplace Changes | |
| | 10.3 The Digital Divide | |

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| | 10.4 The "Winner-Take-All Society" | |
| | 10.5 United Nations Sustainable Development Goals | |
| | 10.6 IT and Sustainability | |

**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. Case studies and discussion | | ✓ | ✓ | ✓ | ✓ |

**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 / Project | 40 | SM1p, ET5p, ET1p, EP5p, EP6p, ET4p | M1, M2, M3, M4, M5 |
| A2. Test | 20 | SM1p, ET5p, ET1p, EP5p | M1, M2, M3 |
| A3. Examination | 40 | SM1p, ET5p, ET1p, EP5p, EP6p | 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. Quinn, M. J. (2020). *Ethics for the Information Age* (8th ed.). Pearson. (EBOOK)

**REFERENCES**

1. Johnson, D. G. (2009). *Computer Ethics* (4th ed.). Pearson.

**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/.