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

FACULTY OF APPLIED SCIENCE

BACHELOR OF SCIENCE IN ARTIFICIAL INTELLIGENCE

LEARNING MODULE OUTLINE

Academic Year	2025/2026	Semester	2
Module Code	SOCI1112		
Learning Module	Sustainable Development		
Pre-requisite(s)	Nil		
Medium of Instruction	English		
Credits	2	Contact Hours	30
Instructor	Yolanda Leong	Email	yolandaleong@mpu.edu.mo
Office	Rm 358, Pearl Jubilee Bldg, MPU Taipa Campus	Office Phone	83998702

MODULE DESCRIPTION

This module offers a foundational understanding of Sustainable Development (SD) through a blend of instructor-led lectures and student-driven exploration. It covers the core concepts, principles, and models of SD, with a focus on its three essential pillars: economic, environmental, and social sustainability. The module delves into the governance systems, laws, and regulations that shape SD efforts worldwide, highlighting diverse development patterns and trends. A key component involves applying this knowledge to analyze frontier issues and social hotspots within China and Macao. Students will be encouraged to investigate critical areas, including regional disparities, green economy, population dynamics, social welfare, and other related topics, to formulate informed perspectives on advancing sustainability in these contexts.

MODULE INTENDED LEARNING OUTCOMES (ILOS)

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

M1.	distinguish and generalize the basic concepts and related fields of sustainable development; (C7)
M2.	identify and summarize the general principles and theories of the sustainable development; define distinguish the fundamental objectives, measures, and the typical cases of governance patterns of sustainable development; (C7, C8, C11)
M3.	understand the trend of sustainable development in the worldwide, including the latest development in environmental protection, advance technology, nation security, political structure green economy, and cultural tourism, etc.; (C7, C8, C11)
M4.	grasp the contents of the sustainable development of Macao society, and to understand the cutting-edge dynamics in related fields, especially those related to the smart cities and artificial intelligence; (C7, C8, C11)
M5.	use relevant theories, drawing lessons from typical cases, explain and evaluate the current situation, conditions and limitations of local sustainable development, and analyse the future sustainable development prospects of Macao in the field of smart cities and artificial intelligence. (C7, C8, C10, C11)

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 artificial intelligence, including machine learning, computer vision and natural language processing;					
P3.	Apply necessary mathematical techniques to model, analyze 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 both relational and non-relational data stores, with an emphasis on how to organize, maintain, retrieve and analyze information;					
P6.	Distinguish the fundamental and operational issues of computer systems and artificial intelligence applications, 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.					

MODULE SCHEDULE, COVERAGE AND STUDY LOAD

Week	Content Coverage		Contact Hours
1-2	1.	Introduction	4
	1.1	Basic concept of sustainable development (SD)	
	1.2	The governance patterns of SD	
3-5	2	The Economic Pillar of Sustainability	6
	2.1	Economic growth and SD	
	2.2	Regional Disparities, wealth gap, and inclusive growth	
	2.3	Technology development and economic sustainability	
6-8	3	The Environmental Pillar of Sustainability	
	3.1	Climate change, environmental protection and green economy	6

	3.2	Natural resources, conservation, waste management	
	3.3	Energy Transition and environmental sustainability	
9-12	4	The Social Pillar of Sustainability	8
	4.1	Population development and SD	
	4.2	Social security, public healthcare, education and gender equality	
	4.3	Political factors and social sustainability	
	5	SD in China and in Macao	
13-15	5.1	SD in China	6
	5.2	SD in Macao	
	5.3	Group presentation	

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 LO**	**ILOs to be Assessed**
A1. Assignment / Classwork	25%	C7, C8, C11	M1, M2, M3, M4, M5
A2. Presentation	25%	C8, C11	M3, M4, M5
A3. Final Report	50%	C7, C8, C11	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

There is no official text for this module. Module notes are distributed in the class.

REFERENCES

1. Benn, S., Edwards, M. & Williams, T. (2022). *Sustainability: A Key Idea for Business and Society*. London & New York: Routledge.
2. Hess, P. N. (2016). *Economic Growth and Sustainable Development*. London & New York: Routledge.
3. Nightingale, A. J. (ed.) (2019). *Environment and Sustainability in a Globalizing World*. London & New York: Routledge.
4. Raworth, K. (2017). *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist*. London: Random House Business Books.
5. Robertson, M. (2021). *Sustainability: Principles and Practice*. London & New York: Routledge.
6. Sachs, J. D. (2015). *The Age of Sustainable Development*. New York: Columbia University Press.
7. Sen, A. (1999). *Development as Freedom*. New York: Oxford University Press.
8. World Commission on Environment and Development (1987). *Our Common Future*. Oxford: Oxford University Press.

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/.