Syllabus

1. **Course name:** Machine learning
2. **Course code:** MALE330863
3. **Credits:** 3 credits (3:0:6) (3 lecture periods, 0 lab period, 6 self-study periods per week)
4. **Instructors**
   a. Chief lecturer: Ph.D. Nguyen Manh Hung
   b. Co-lecturers: Meng. Ngo Ba Viet
5. **Course Requirements**

   Prerequisite course(s): C Programming Language

   Previous course(s): Probability and Applied Statistic
6. **Course Description**

   This course on Machine Learning is intended to provide learners with the fundamental knowledge of machine learning algorithms and practical applications in the Python language. The algorithms include supervised learning, unsupervised learning, and recommendation systems. In addition, techniques for model evaluation and model selection are also presented. Sklearn library and Python language are introduced to implement these machine-learning algorithms.
7. **Learning Outcomes (CLOs)**

CLOs	Descriptions *On successful completion of this course students will be able to:*	ELO(s) /PI(s)	Compe-tency
CLO1	Ability to describe machine learning algorithms	ELO1/PI1.2	M
CLO2	Ability to conduct AI experiments follow instructions.	ELO2/PI2.1	M
CLO3	Ability to apply machine learning packages such as sklearn, pandas to solve machine learning problems	ELO4/PI4.3	M
CLO4	Ability to Applied and integrated AI tools into products	ELO5/PI5.1	R

8. **Content outline**
   - Overview of machine learning problems. The algorithm includes supervised learning, unsupervised learning, reinforcement learning.
   - Reviewing object-oriented programming in Python and how to use the sklearn, pandas, numpy, matplotlib packages.
   - Introduction of well-known algorithms such as linear regression, neural network, convolution neural network, and SVM. Four factors include model representations, parameters, hyper-parameters, loss function are discussed in detail.
   - Introduction of model selections and tuning hyperparameters.
   - Introduction of unsupervised-learning algorithms such as dimensionality reduction and clustering.
   - Introduction major components of an AI product, the AI life cycle.
9. **Teaching Methods**
   - *Presentation method*
   - *Conversation Method*

_ Teamwork method

10. Assessment(s)

– Grading scale: **10**

– Assessment plan:

No.	Content	CLOs	Compe-tency	Assessment methods	Assessment tools	Weighting %
Formative assessment						**50**
1.	Follow documents to use an AI tool	CLO2	R	Observation form	Particular situation	*20*
2.	Introduce the mathematical model, objective function, and training method of a machine learning algorithm.	CLO1	M	Observation form	Rubric	*20*
3	Programmatically train and refine a machine learning model	CLO3	M	Observation form	Rubric	*10*
Summative assessment						**50**
4.	Implement an machine-learning application.	CLO2-CLO4	M-R	Observation form	Rubric	50

11. Learning Materials

– Textbook(s):

Trương Ngọc Sơn, *Giáo trình trí tuệ nhân tạo- cơ sở và ứng dụng*, NXB Đại Học Quốc Gia Tp HCM- 2020.

– References:

Trần Hạnh Nhi, Dương Anh Đức, *Cấu trúc dữ liệu và giải thuật*, NXB Đại Học Quốc Gia Tp HCM- 2010

12. General Information:

Academic Integrity

All students in this class are subject to HCMUTE's Academic Integrity Policy (http://sao.hcmute.edu.vn/) and should acquaint themselves with its content and requirements, including a strict prohibition against plagiarism. Any violations will be reported to the Faculty of Electrical and Electronic Engineering Dean's office.

Flexibility Notice

Any information in this syllabus (other than grading and absence policies) may be subject to change with reasonable advanced notice. Students need to regularly update the information of their registered class.

Intellectual Property

All contents of these lectures, including written materials distributed to the class, are under copyright protection from the HCMUTE's Intellectual Property Regulations. Notes based on these materials may not be sold or commercialized without the express permission of the instructor.

13. Approval Date: *<dd/mm/yyyy>*

14. Endorsement:

Dean	Head of Department	Chief Lecturer
Assoc. Prof. Dr. Nguyen	**Assoc. Prof. Dr. Nguyen**	*<Full Name>*

Minh Tam	Thanh Hai	

15. Revision History:

1st Revision: *<dd/mm/yyyy>*	Lecturer: Head of Department: **Assoc. Prof. Dr. Nguyen Thanh Hai**
2nd Revision: *<dd/mm/yyyy>*	Lecturer: Head of Department: