课程详述
COURSE SPECIFICATION

以下课程信息可能根据实际授课需要或在课程检讨之后产生变动。如对课程有任何疑问，请联系授课教师。

The course information as follows may be subject to change, either during the session because of unforeseen circumstances, or following review of the course at the end of the session. Queries about the course should be directed to the course instructor.

1.	课程名称 Course Title	人工智能导论 Introduction to Artificial Intelligence
2.	授课院系 Originating Department	计算机科学与工程系 Department of Computer Science and Engineering
3.	课程编号 Course Code	CS103
4.	课程学分 Credit Value	2
5.	课程类别 Course Type	通识选修课程 General Education (GE) Elective Courses
6.	授课学期 Semester	秋季 Fall
7.	授课语言 Teaching Language	中英双语 English & Chinese
8.	授课教师、所属学系、联系方式（如属团队授课，请列明其他授课教师） Instructor(s), Affiliation& Contact （For team teaching, please list all instructors）	刘江，教授，计算机科学与工程系，liuj@sustech.edu.cn Jiang Liu, Professor, Department of Computer Science and Engineering, liuj@sustech.edu.cn
9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact	
10.	选课人数限额(可不填) Maximum Enrolment（Optional）	

11.	授课方式 Delivery Method	讲授 Lectures	习题/辅导/讨论 Tutorials	实验/实习 Lab/Practical	其它(请具体注明) Other（Please specify）	总学时 Total
	学时数 Credit Hours	32				32

12.	先修课程、其它学习要求 **Pre-requisites or Other Academic Requirements**	NA
13.	后续课程、其它学习规划 **Courses for which this course is a pre-requisite**	无 None
14.	其它要求修读本课程的学系 **Cross-listing Dept.**	无 None

教学大纲及教学日历 SYLLABUS

15. 教学目标 **Course Objectives**

This course provides an introduction to artificial intelligence （AI）. Topics talked will help students to achieve the following 3 main objectives:

1) Highlight fundamental AI concepts: including agent, knowledge, search, game theory, reasoning, planning, learning, and importantly biological and psychological foundations behind AI development.

2) Introduce the current data driven deep learning AI models, algorithms and platforms: including the development of deep neural network and various popular deep learning network structures and development platforms.

3) Inspire student's interest in AI: In order to encourage students to engage AI in their future careers and study, various AI applications will be introduced and discussed. Students are asked to work on AI application projects, group project presentation will be graded.

人工智能导论课程将介绍人工智能的基本概念及理论，将从以下 3 个方面进行展开：

1） 详述人工智能的基础概念： 包括自主智能体 AGENT， 知识， 搜索，游戏理论，推理，计划， 学习，以及人工智能的生物和心理学基础。

2） 介绍人工神经元网络以及现在流行的基于数据驱动的深度学习人工智能网络模型，算法，平台

3） 激发学生对人工智能的兴趣：为了学生未来学习/科研/职业的发展，课程将介绍各种人工智能的应用， 并要求学生围绕人工智能相关的应用及热点课题参与人工智能导论课程项目。

16. 预达学习成果 **Learning Outcomes**

On completion of the "**Introduction to Artificial Intelligence**" module, students should be able to:

1) Understand the AI computation and biological foundation and agent-based AI architecture

2) Learn the deep learning AI algorithms and techniques

3) Inspire them to think and explore further in engaging AI for real-world applications in the future studies

人工智能导论课程结束后，学生应该获得以下技能：

1） 理解人工智能计算和生物理论基础，理解人工智能基于自主智能体的结构框架

2） 掌握深度学习人工智能算法和技术

3） 激发学生思考人工智能以及在未来的学习/科研/工作中运用人工智能来解决实际问题。

17. 课程内容及教学日历 （如授课语言以英文为主，则课程内容介绍可以用英文；如团队教学或模块教学，教学日历须注明主讲人）
Course Contents (in Parts/Chapters/Sections/Weeks. Please notify name of instructor for course section(s), if this is a team teaching or module course.)

Week 1: Introduction of AI: Definition and Issues

Week 2: Solving Problem by Searching

Week 3: Problem Space and Search

Week 4: Blind Search Heuristic Search

Week 5: Game Play Theory

Week 6: Machine Learning

Week 7: Neural Network Models and Revision

Week 8: Mid-Term Examination

Week 9: Feed Forward Neural Networks

Week 10: Deep Learning - Convolutional Neural Networks

Week 11: Deep Learning -Network Optimization and Regularization

Week 12: Deep Learning – Memory and Focus mechanism

Week 13: Data mining, Knowledge Representation and Reasoning

Week 14: Probabilistic Reasoning and Bayesian Theorem

Week 15: Project Presentations

Week 16: Summary and Revision

第一周： 人工智能概述： 人工智能的定义和研究热点

第二周：利用搜索机制解决问题的方法介绍

第三周：问题空间与搜索机制的方法介绍

第四周：盲搜索与启发式搜索的方法介绍

第五周：游戏理论介绍

第六周：机器学习概论

第七周：神经网络及复习

第八周：期中考试

第九周：正向神经网络

第十周：深度学习之卷积神经网络

第十一周：深度学习之网络优化与正则化

第十二周：深度学习之记忆与注意力机制

第十三周：数据挖掘，知识表达及推理

第十四周：统计推理及贝叶斯理论

第十五周：课程项目报告

第十六周：课程复习

18. 教材及其它参考资料 Textbook and Supplementary Readings

1. Artificial Intelligence – A Modern Approach (AIMA) (Russell/Norvig)

   Web site: http://aima.cs.berkeley.edu/

2. Neural Networks and Deep Learning 《神经网络与深度学习》邱锡鹏

   Web site: https://nndl.github.io/

课程评估 ASSESSMENT

19.

评估形式 Type of Assessment	评估时间 Time	占考试总成绩百分比 % of final score	违纪处罚 Penalty	备注 Notes
出勤 Attendance		10%		
课堂表现 Class Performance				
小测验 Quiz				
课程项目 Projects		40%		
平时作业 Assignments				
期中考试 Mid-Term Test		20%		
期末考试 Final Exam		30%		
期末报告 Final				

Presentation 其它（可根据需要改写以上评估方式） **Others (The above may be modified as necessary)**		5		

20. **记分方式 GRADING SYSTEM**

☑ A. 十三级等级制 **Letter Grading**
☐ B. 二级记分制（通过/不通过） **Pass/Fail Grading**

课程审批 REVIEW AND APPROVAL

21. 本课程设置已经过以下责任人/委员会审议通过
    This Course has been approved by the following person or committee of authority