

COMP310

Multi-Agent Systems

Session: 2017-2018

Dr Terry R. Payne
Department of Computer Science



SECOND EDITION

An Introduction to

MultiAgent Systems

MICHAEL WOOLDRIDGE



Bargaining & Negotiation



Auctions



Argumentation & Dialogue

Social Welfare (Voting)



Planning & Deliberation

Rational Decision Making



Coalitions

General Admin

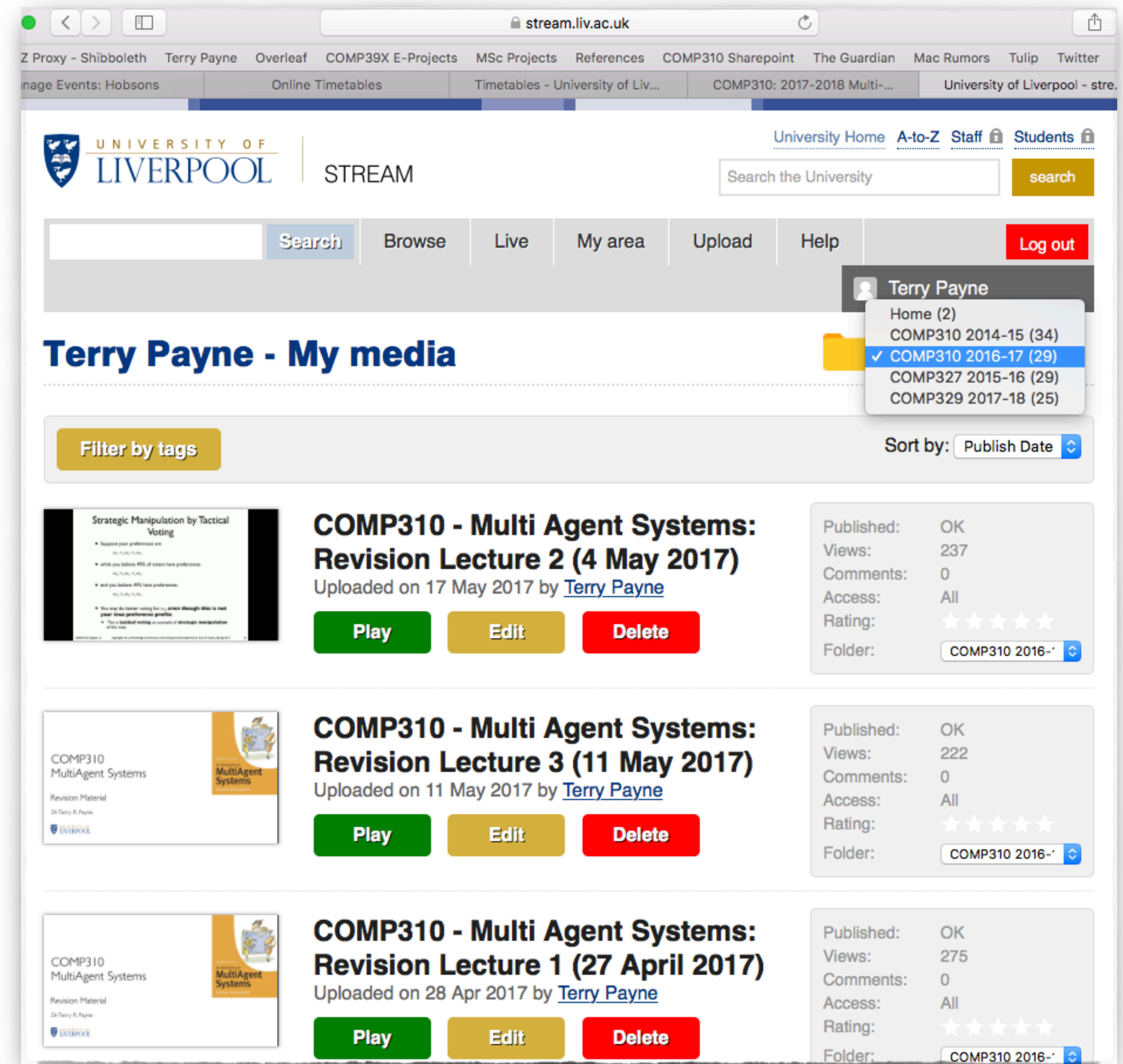
- Lecturer: Dr Terry Payne
 - Ashton Building
 - Email: T.R.Payne@liverpool.ac.uk
 - Surgery: Mon/Wed/Thur (email for appointment)
- Course Notes
 - Available from the web site as pdfs
 - Lectures will be screen cast and available from the web sites
- Web Site and Resources
 - General information
 - <http://www.csc.liv.ac.uk/people/trp/COMP310.html>

The screenshot shows a web browser window with the URL cgi.csc.liv.ac.uk. The page is titled "COMP310: 2017-2018 Multi-Agent Systems". It features a navigation menu with links for Home, Latest News, Publications, Research, People, Teaching, and Contact. The main content area is divided into several sections:

- Administration:** Includes links for Resources (this page), Syllabus, Announcements, Assessment (100% exam), iTunes U (with a link to visit), Lecture Times (Mon: 13.00 - 14.00 (SCTH-MR), Wed: 11.00 - 12.00 (REN-LT7), Thurs: 13.00 - 14.00 (ERB-ERT)), No Practical Labs, and Assessment Weightings (100% exam).
- Module Description:** Includes Aims (4 points) and Learning Outcomes (4 points).
- Lecture Sets (pdf):** Lists Lecture Notes (2017 - 2018) and various lecture topics with corresponding PDF links.
- Class Reading:** Lists reading materials for Intelligent Agents and Multi-Agent Systems.

Module Delivery

- 3 Lectures per week
 - Lectures will be captured and uploaded to the stream site
 - Lectures from previous years have been lecture captured and available from the web site
 - Attendance is still expected!!
- No Lab Classes or Assignments
 - Revision Exercises will be made available
- The module will be 100% Exam



The screenshot shows the University of Liverpool Stream website. The user is logged in as Terry Payne. The page displays a list of uploaded videos under the heading "Terry Payne - My media". The videos are:

- COMP310 - Multi Agent Systems: Strategic Manipulation by Tactical Voting** (Thumbnail: Strategic Manipulation by Tactical Voting)
- COMP310 - Multi Agent Systems: Revision Lecture 2 (4 May 2017)** (Uploaded on 17 May 2017 by Terry Payne)
- COMP310 - Multi Agent Systems: Revision Lecture 3 (11 May 2017)** (Uploaded on 11 May 2017 by Terry Payne)
- COMP310 - Multi Agent Systems: Revision Lecture 1 (27 April 2017)** (Uploaded on 28 Apr 2017 by Terry Payne)

Each video entry includes a "Play" button, an "Edit" button, and a "Delete" button. To the right of each video, there are statistics: Published (OK), Views, Comments (0), Access (All), Rating (5 stars), and Folder (COMP310 2016-').

iTunesU

- The module was previously made available from iTunesU
 - Slides are available from iTunes
 - There may be some revisions in the current slides.
- Full materials available from the iTunesU application on iOS.
 - Links to papers
 - Lecture notes
 - Links to Screen Casts

iTunes U > University of Liverpool



Subscribe

University of Liverpool
Category: Computer Science
Language: English
Published 27 Mar, 2015
When viewed using the iTunes U app for iOS, this course may also include enhanced materials such as instructor notes and assignments.

Multi-Agent Systems

Terry Payne

Details Ratings and Reviews Related

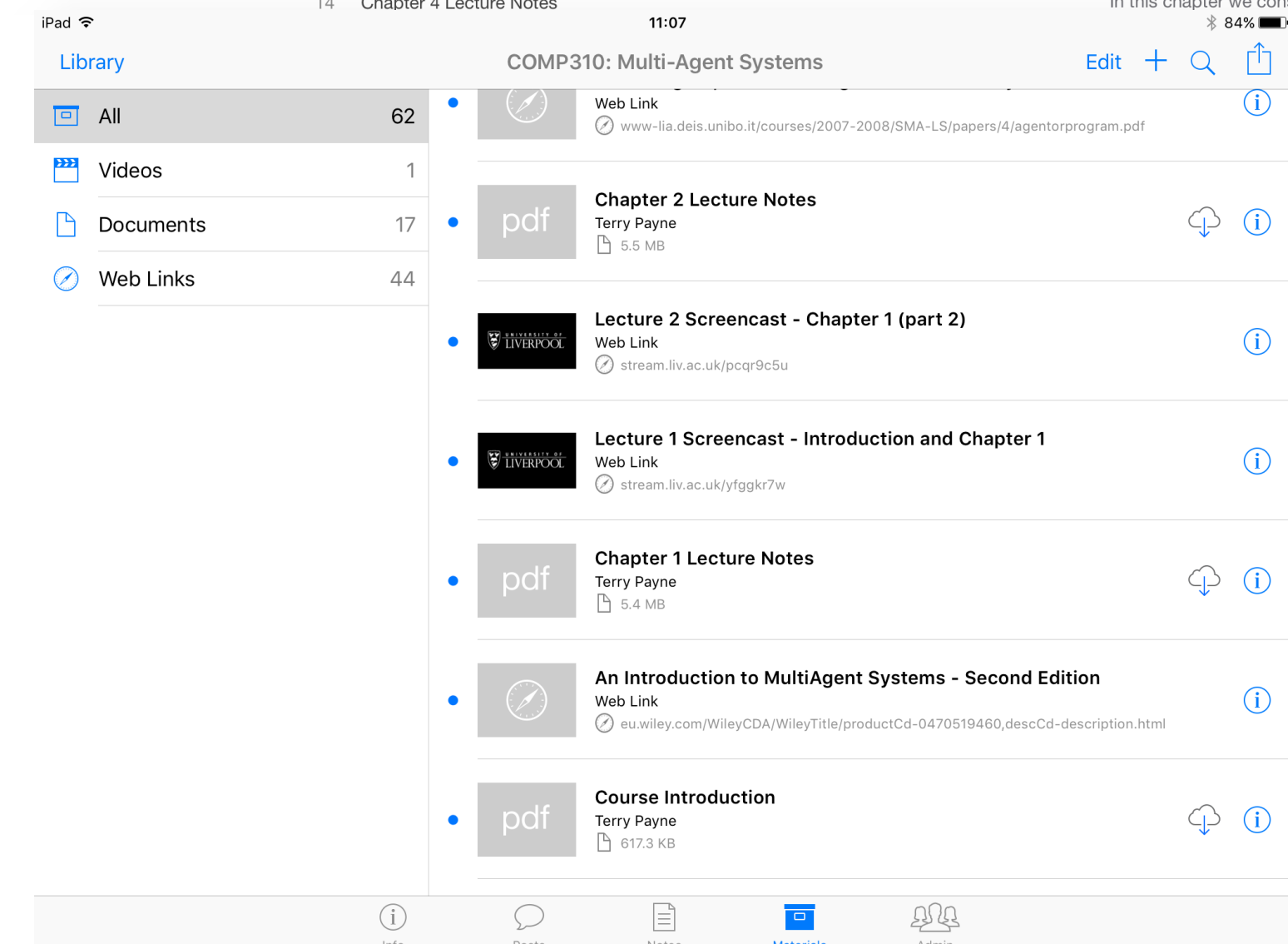
Description

Multi-agent systems have emerged as one of the most important areas of research and development in information technology in the 1990s. A multi-agent system is composed of multiple interacting software components known as agents, which are typically capable of co-operating to solve problems that are beyond the individual member. Multi-agent systems are important primarily because they have been found to have very wide applicability, in areas as diverse as industry and electronic commerce. This module will begin by introducing the student to the notion of an agent, and will lead them to an understanding of what an agent can be constructed, and how agents can be made to co-operate effectively with one another to solve problems.

Course Outline

- I. Introduction: what is an agent?
 - a. Agents vs objects, expert systems and distributed systems
 - b. typical application areas for agent systems.
- II. Intelligent Agents: the design of intelligent agents
 - a. Abstract Models of Agents

NAME	TIME	RELEASED	DESCRIPTION	POPULARITY
1 Chapter 16 Lecture Notes			In this final chapter, we examine the...	i
2 Chapter 15 Lecture Notes			This chapter explores negotiation t...	i
3 Chapter 14 Lecture Notes			In this chapter, we explore the notio...	i
4 Chapter 13 Lecture Notes			In this chapter we explore Coalition...	i
5 Chapter 12 Lecture Notes			This chapter explores the theory be...	i
6 Chapter 11 Lecture Notes			In this chapter, we explore the basi...	i
7 Chapter 10 Lecture Notes			This chapter examines a number of...	i
8 Chapter 9b Lecture Notes			We explore the notion of mobile ag...	i
9 Chapter 9a Lecture Notes			We briefly review the scenarios in w...	i
10 Chapter 8 Lecture Notes			This chapter focuses on how agent...	i
11 Chapter 7 Lecture Notes			In this chapter, we discuss some as...	i
12 Demonstration of Steels Rover	8 min		This is a demo of the rules for direc...	i
13 Chapter 5 Lecture Notes			In this chapter we examine reactive...	i
14 Chapter 4 Lecture Notes			In this chapter we considered pract...	i



Main Taught Material

● Introduction

- what is an agent?
- agents and objects
- agents and expert systems
- agents and distributed systems
- typical application areas for agent systems

● Intelligent Agents

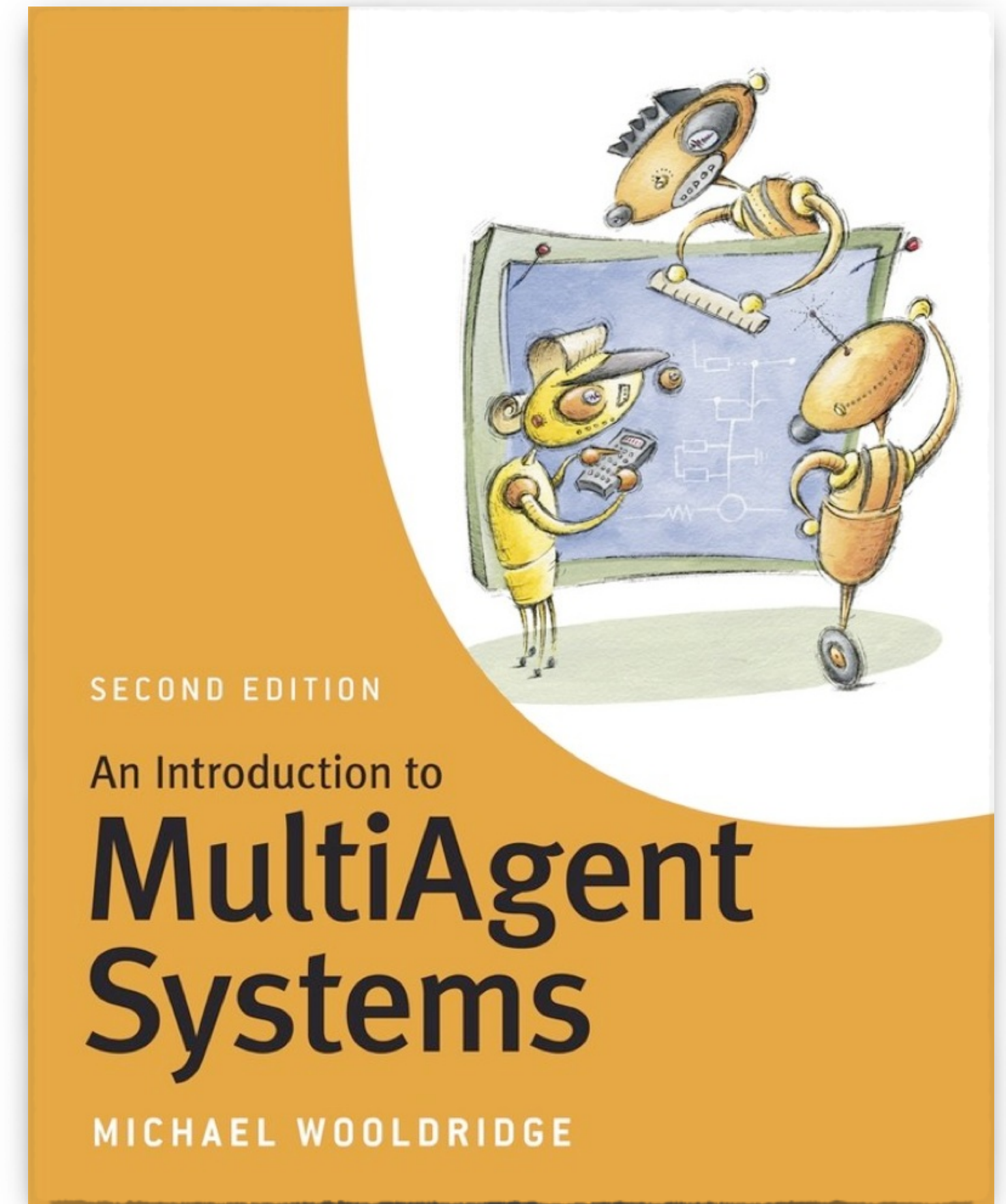
- the design of intelligent agents - reasoning agents
- agents as reactive systems
- hybrid agents
- layered agents

● MultiAgent Systems

- classifying multi-agent interactions - cooperative versus non-cooperative
- zero-sum and other interactions
- what is cooperation?
- how cooperation occurs - the Prisoner's dilemma and Axelrod's experiments
- interactions between self-interested agents:
 - auctions & voting systems; negotiation
- Interactions between benevolent agents: cooperative distributed problem solving
- coherence and coordination
- argumentation, legal reasoning, dialogues

Course Text

- The module is based on Michael Wooldridge's book:
 - An Introduction to MultiAgentSystems
 - Wiley 2009
 - <http://www.cs.ox.ac.uk/people/michael.wooldridge/pubs/imas/IMAS2e.html>
- The material has also been revised and updated over the last few years
 - Thanks go to both Mike (who used to teach this course) and additional material by Simon Parsons.



Module Aims

- Module Aims

1. To introduce the student to the concept of an agent and multi-agent systems, and the main applications for which they are appropriate;
2. To introduce the main issues surrounding the design of intelligent agents;
3. To introduce the main issues surrounding the design of a multi-agent society;
4. To introduce a contemporary platform for implementing agents and multi-agent systems.

Module Objectives

- At the end of the module, the student will be able to demonstrate:
 1. Understand the notion of an agent, how agents are distinct from other software paradigms (eg objects) and understand the characteristics of applications that lend themselves to an agent-oriented solution;
 2. Understand the key issues associated with constructing agents capable of intelligent autonomous action, and the main approaches taken to developing such agents;
 3. Understand the key issues in designing societies of agents that can effectively cooperate in order to solve problems, including an understanding of the key types of multi-agent interactions possible in such systems;
 4. Understand the main application areas of agent-based solutions, and be able to develop a meaningful agent-based system using a contemporary agent development platform.

Finally

- The obvious...
 - Switch off all mobile phones during lectures
 - Do not sign the register on behalf of others
 - Attend lectures and attempt the exercises set - this will help you do the continuous assessments
 - Ask questions if there is anything that you do not understand
- And respect your fellow students...
 - There are people here who want to learn!
 - If you want to talk or mess around, then fine...
 - ...BUT do it somewhere else!