Department of Computing
School of Advanced Technology

MODULE HANDBOOK

Module Code: CPT104

Module Title: Operating Systems Concepts

Dr. Gabriela Mogos

Dr. Dongyao Jia

Semester 2

2023-2024

SECTION A: Basic Information

❑ **Brief Introduction to the Module**

This module introduces students to conducting research in the field of operating systems. It provides a broad grounding in computer science with an understanding of the structure and functionality of modern operating systems. It also explains how the principal components of computer-based systems perform their functions and how they interact with each other.

❑ **Key Module Information**

Module name: Operating Systems Concepts

Module code: CPT104

Credit value: 5

Semester in which the module is taught: S2

Pre-requisites needed for the module: CPT105 or CPT111, CPT101

Programmes on which the module is shared: *BSc Information and Computing Science*

❑ **Delivery Schedule**

Lecture day, time and room:
Monday, 11,00 – 12,50, SD102, Week: 1-13

Tutorial day, time and room:
Tuesday, 16,00 – 16,50, SC169, Week: 1-13

Lab day, time and rooms:
Thursday, 9,00 – 9,50, SD546, SD554, Week: 1-13
Thursday, 10,00 – 10,50, SD546, SD554, Week: 1-13

❑ **Module Leader and Contact Details**

Name: Gabriela Mogos

Email address: Gabriela.Mogos@xjtlu.edu.cn

Brief Biography: *Refer to XJTLU page*

Office telephone number: 88161515

Room number and office hours: **SD547; Monday 13,00 – 14,00**
Tuesday 15,00 – 16,00 and by appointment

Preferred means of contact: email

❑ **Additional Teaching Staff and Contact Details**

Name: Dongyao Jia

Email address: Dongyao.Jia@xjtlu.edu.cn

Brief Biography: *Refer to XJTLU page*

Office telephone number: 88165353

Room number and office hours: **SC238; Thursday 16,00 – 18,00 and by appointment**

Preferred means of contact: email

SECTION B: What you can expect from the module

❑ **Educational Aims of the Module**

1. To introduce students to the structure and functionality of modern operating systems.
2. To explain how the principal components of computer-based systems perform their functions and how they interact with each other.

❑ **Learning Outcomes**

At the end of this module the student should be able to:
1. State the overall structure and functionality of a modern operating system and the interactions between computer hardware and user-programs.
2. Identify the operations of the major components of an operating system, including the device manager, file manager, memory manager, and process manager.

3. Identify the functions of system programs, including parsers, compilers, and virtual machines.

4. Develop small programs using multiprocess and multithread programming techniques.

❑ **Assessment Details**

Sequence	Method	Assessment Type (EXAM or CW)	Learning outcomes assessed (Use codes under learning outcomes.)	Duration	Week	% of final mark	Resit (Y/N/S)[1]
#001	Final Exam	EXAM	ALL	2 hour(s)		80	S
#002	Assessment task	CW/Online Quiz	All	hour(s)		10	
#003	Assessment task	CW/Online Quiz	All	hour(s)		10	
#900	Resit Exam	EXAM	ALL	2 hour(s)		100	

1. The resit exam will assess all of the learning outcomes of the module and will be weighted as 100% of the final module mark. Other components of the assessment, regardless of whether or not the student passed or failed, will not be included in the calculation of the final module mark, following resit examinations.

2. The University does not allow resits for final year students, whilst the resit opportunity will be introduced for next ordinary sitting of the examinations/assessments for the failed modules.

3. **Assessment I**

Task: See the specification in LMO

Deadline: See the specification in LMO

Grading: The assessment, based on the learning outcomes, has maximum of 100 marks. Exam will be designed with primary course objectives in mind and cover material from all components of a course (lectures, tutorials, labs.).

4. **Assessment II**

Task: See the specification in LMO

Deadline: See the specification in LMO

Grading: The assessment, based on the learning outcomes, has maximum of 100 marks. Exam will be designed with primary course objectives in mind and cover material from all components of a course (lectures, tutorials, labs.).

❑ **Methods of Learning and Teaching**

Lectures: Students will be expected to attend formal lectures in a typical week. Formal lectures will be used to introduce students to the concepts and methods covered by the module, reinforced by practical illustrations and exercises using systems available to the students.

Tutorials: Students will be expected to attend formal lectures in a typical week. Formal tutorials will be used to reinforce through illustrations and practical exercises the methods and algorithms covered in the module.

Labs: The formal lectures will be reinforced by practical illustrations and exercises using systems available to the students (Linux, Windows, C). Computer labs practical are intended to allow students to undertake practical exercises with the possibility of immediate feedback.

Private study: In a typical week student will be expected to devote approximately 6 hours of unsupervised time to private study; private study will provide time for reflection and consideration of lecture material and background reading and completion of the assessment tasks.

Assessment: Continuous assessment will be used to test to what extent practical skills have been learnt. A final examination at the end of the module will assess the academic achievement of students.

❑ Syllabus & Teaching Plan

Week Number	Lecture	Topic/Theme/Title	Pre-reading
Week 1	Lecture 1	Processes	Ch 1 + Ch 2 +Ch 3 of module textbook
Week 2	Lecture 2	Threads	Ch 4 of module textbook
Week 3	Lecture 3	Process Synchronization	Ch 5 of module textbook
Week 4	Lecture 4	CPU Scheduling I	Ch 6 of module textbook
Week 5	Lecture 5	CPU Scheduling II	Ch 6 + Ch 7 of module textbook
Week 6	Lecture 6	Deadlocks	Ch 7 of module textbook
Week 7	Lecture 7	Main Memory **+ Assessment I (Tutorial)**	Ch 8 of module textbook
Week 8	Lecture 8	Virtual Memory	Ch 9 of module textbook
Week 9	Lecture 9	Mass Storage Systems	Ch 10 of module textbook
Week 10	Lecture 10	File System	Ch 11 + Ch 12 of module textbook
Week 11	Lecture 11	I/O Systems	Ch 13 of module text
Week 12	Lecture 12	Protection and Security **+ Assessment II (Tutorial)**	Ch 14 + Ch 15 of module textbook
Week 13	Lecture 13	The Virtual Machines and Distributed Systems **Review**	Ch 16 + Ch 17 of module textbook

❑ Tutorial Schedule
For modules which have the timetabled tutorials

Student Group	Time	Day	Venue	Lecturer/Instructor
ALL	*16,00-16,50*	*Tuesday*	*SC169*	*Gabriela Mogos*

❑ **Lab Schedule**

For modules which have the timetabled labs

Student Group	Time	Day	Venue	Instructor
G1	9,00-9,50	Thursday	SD554	Dongyao Jia
G2	9,00-9,50	Thursday	SD546	Dongyao Jia
G3	10,00-10,50	Thursday	SD554	Dongyao Jia
G4	10,00-10,50	Thursday	SD546	Dongyao Jia

❑ **Reading Materials**

Mandatory textbook

OPERATING SYSTEM CONCEPTS, A. SILBERSCHATZ, P. B. GALVIN & G. GAGNE, 9TH EDITION, WILEY.

Optional textbooks

1. *UNDERSTANDING OPERATING SYSTEMS, I. M. FLYNN and A. MCIVER-MCHOES, 9781305674257 / THOMSON*

2. *COMPILER CONSTRUCTION: PRINCIPLES AND PRACTICE, K. C. LOUDEN 9780534939724 / THOMSON*

3. *PROGRAMMING LANGUAGE PROCESSORS IN JAVA COMPILERS AND INTERPRETERS, D. WATT, D. BROWN and R. W. SEBESTA, 9780130257864 / PRENTICE HALL*

4. *C PROGRAMMING LANGUAGE, 2ND EDITION, BRIAN W. KERNIGHAN & DENNIS M. RITCHIE, 9780133086249 / PEARSON*

SECTION C: Additional Information

❑ **Attendance**
Students who are able to be on campus are reminded of the Academic Policy requiring no less than 80% attendance at classes. Failure to observe this requirement may lead to failure or exclusion from resit examinations or retake examinations in the following year.

- **Student Feedback**

  The University is keen to elicit student feedback to make improvements for each module in every session. It is the University policy that the preferred way of achieving this is by means of an Online Module Evaluation Questionnaire Survey. Students will be invited to complete the questionnaire survey for this module at the end of the semester.

  You are strongly advised to read the policies mentioned below very carefully, which will help you better perform in your academic studies.   All the policies and regulations related to your academic study can be found in 'Student Academic Services' section under the heading "Policies and Regulations*"* **on [E-bridge](#).**

- **Plagiarism, Cheating, and Fabrication of Data.**

  Offences of this type can result in attendance at a university-level committee and penalties being imposed. You need to be familiar with the rules. Please see the "Academic Integrity Policy" available on e-Bridge in the 'Student Academic Services' section under the heading 'Policies and Regulations'.

- **Rules of submission for assessed coursework**

  The University has detailed rules and procedures governing the submission of assessed coursework.   You need to be familiar with them. Details can be found in the "Code of Practice for Assessment" available on e-Bridge in the '*Student Academic Services*' section under the heading 'Policies and Regulations'.

- **Late Submission of Assessed Coursework**

  The University attaches penalties to the late submission of assessed coursework.   You need to be familiar with the University's rules. Details can be found in the "*Code of Practice for Assessment*" available on e-Bridge in the 'Student Academic Services' section under the heading 'Policies and Regulations'.

- **Mitigating Circumstances**

  The University is able to take into account mitigating circumstances, such as illness or personal circumstances which may have adversely affected student performance on a module. It is the student's responsibility to keep their Academic Advisor, Programme Director, or Head of Department informed of illness and other factors affecting their progress during the year and especially during the examination period. Students who believe that their performance on an examination or assessed coursework may have been impaired by illness, or other exceptional circumstances should follow the procedures set out in the "*Mitigating Circumstances Policy*", which can be found on e-Bridge in the '*Student Academic Services*' section under the heading 'Policies and Regulations'.

❑ **Learning Mall Core**

Copies of lecture notes and other materials are available electronically through XJTLU Learning Mall Core, the University's virtual learning environment at: https://sso.xjtlu.edu.cn/login.