KING'S OWN INSTITUTE*
Success in Higher Education

ICT201 COMPUTER ORGANISATION AND ARCHITECTURE T323 BRIEF

All information in the Subject Outline is correct at the time of approval. KOI reserves the right to make changes to the Subject Outline if they become necessary. Any changes require the approval of the KOI Academic Board and will be formally advised to those students who may be affected by email and via Moodle.
Information contained within this Subject Outline applies to students enrolled in the trimester as indicated

1. General Information

1.1 Administrative Details

Associated HE Award(s)	Duration	Level	Subject Coordinator
Bachelor of Information Technology (BIT)	1 trimester	Level 2	Mr Ali Noori ali.noori@koi.edu.au P: +61 (2) 9283 3583 L: Level 1-2, 17 O'Connell St. Consultation: via Moodle or by appointment.

1.2 Core / Elective

Core subject in the BIT

1.3. Subject Weighting

Indicated below is the weighting of this subject and the total course points.

Subject Credit Points	Total Course Credit Points
4	BIT (96 Credit Points)

1.4 Student Workload

Indicated below is the expected student workload per week for this subject

No. timetabled hours/week*	No. personal study hours/week**	Total workload hours/week***
4 hours/week (2 hour Lecture + 2 hour Tutorial)	6 hours/week	10 hours/week

*   Total time spent per week at lectures and tutorials
**   Total time students are expected to spend per week in studying, completing assignments, etc.
***   Combination of timetable hours and personal study.

1.5 Mode of Delivery   Classes will be face-to-face or hybrid. Certain classes will be online (e.g., special arrangements).

1.6 Pre-requisites   6 subjects completed

1.7 General Study and Resource Requirements

o   Dedicated computer laboratories are available for student use. Normally, tutorial classes are conducted in the computer laboratories.
o   Students are expected to attend classes with the requisite textbook and must read specific chapters prior to each tutorial. This will allow them to actively take part in discussions. Students should have elementary skills in both word processing and electronic spreadsheet software, such as OFFICE 365 or MS Word and MS Excel.
o   Computers and WIFI facilities are extensively available for student use throughout KOI. Students are encouraged to make use of the campus Library for reference materials.

o Students will require access to the internet and email. Where students use their own computers, they should have internet access. KOI will provide access to required software.

Resource requirements specific to this subject: MS Imagine, Office 365

1.8 Academic Advising

Academic advising is available to students throughout teaching periods including the exam weeks. As well as requesting help during scheduled class times, students have the following options:
o Consultation times: A list of consultation hours is provided on the homepage of Moodle where appointments can be booked.
o Subject coordinator: Subject coordinators are available for contact via email. The email address of the subject coordinator is provided at the top of this subject outline.
o Academic staff: Lecturers and Tutors provide their contact details in Moodle for the specific subject. In most cases, this will be via email. Some subjects may also provide a discussion forum where questions can be raised.
o Head of Program: The Head of Program is available to all students in the program if they need advice about their studies and KOI procedures.
o Vice President (Academic): The Vice President (Academic) will assist students to resolve complex issues (but may refer students to the relevant lecturers for detailed academic advice).

2. Academic Details

2.1 Overview of the Subject

This subject provides a broad understanding of Computer Organisation and Architecture. It covers the internal functioning of computer hardware systems and operating systems and the way computer operations are managed. This subject explains algorithms and data structures used in controlling the functioning of a computer through rules and methods that describe the functionality, organisation and implementation of computer systems. Security aspects of operating systems are also covered.

2.2 Graduate Attributes for Undergraduate Courses

Graduates of Bachelor courses from King's Own Institute (KOI) will achieve the graduate attributes expected under the Australian Qualifications Framework (2nd edition, January 2013). Graduates at this level will be able to apply a broad and coherent body of knowledge from their major area of study in a range of contexts for professional practice or scholarship and as a pathway for further learning.

King's Own Institute's generic graduate attributes for a bachelor's level degree are summarised below:

	KOI Bachelor Degree Graduate Attributes	Detailed Description
	Knowledge	Current, comprehensive and coherent knowledge
	Critical Thinking	Critical thinking and creative skills to analyse and synthesise information and evaluate new problems
	Communication	Communication skills for effective reading, writing, listening and presenting in varied modes and contexts and for transferring knowledge and skills to a variety of audiences
	Information Literacy	Information and technological skills for accessing, evaluating, managing and using information professionally
	Problem Solving Skills	Skills to apply logical and creative thinking to solve problems and evaluate solutions

	Ethical and Cultural Sensitivity	Appreciation of ethical principles, cultural sensitivity and social responsibility, both personally and professionally
	Teamwork	Leadership and teamwork skills to collaborate, inspire colleagues and manage responsibly with positive results
	Professional Skills	Professional skills to exercise judgement in planning, problem solving and decision making

Across the course, these skills are developed progressively at three levels:

o **Level 1 Foundation –** Students learn the basic skills, theories and techniques of the subject and apply them in basic, stand-alone contexts.
o **Level 2 Intermediate –** Students further develop skills, theories and techniques of the subject and apply them in more complex contexts, beginning to integrate the application with other subjects.
o **Level 3 Advanced** – Students have a demonstrated ability to plan, research and apply the skills, theories and techniques of the subject in complex situations, integrating the subject content with a range of other subject disciplines within the context of the course.

2.3 Subject Learning Outcomes

This is a Level 2 subject.

Listed below, are *key* knowledge and skills students are expected to attain by successfully completing this subject:

Subject Learning Outcomes	Contribution to Graduate Attributes
a) Describe the major components of computer systems and explain how they control the operation of a computer	
b) Explain the processes for synchronisation, scheduling and handling deadlocks	
c) Explain how operating systems manage memory, storage, file systems and input/output processes	
d) Evaluate security issues and safeguards to protect against threats and recover from disasters.	

2.4 Subject Content and Structure

Below are details of the subject content and how it is structured, including specific topics covered in lectures and tutorials. Reading refers to the text unless otherwise indicated.

Weekly Planner:

Week (beginning)	Topic covered in each week's lecture	Reading(s)	Expected work as listed in Moodle
1 30 Oct	Computer system overview	Ch. 1	Discuss review questions in the tutorial on computer systems. Formative not graded.
2 06 Nov	Operating system overview	Ch. 2	Discuss review questions in the tutorial on system calls and activities of an operating system. Graded.

3 13 Nov	Process description and control, threads	Chs. 3, 4	Discuss review questions in the tutorial. Graded.
4 20 Nov	Uniprocessor scheduling	Ch. 9	Discuss review questions in the tutorial on scheduling. Graded. **Assessment 2: Formative - Moodle Quiz**
5 27 Nov	Concurrency: mutual exclusion and synchronisation	Ch. 5	Discuss review questions in the tutorial on synchronization problems. Graded.
6 04 Dec	Concurrency: deadlock and starvation	Ch. 6	Discuss review questions in the tutorial on deadlocks. Graded. **Assignment 3 - Mid trimester test.** Summative worth 15%
7 11 Dec	Memory management	Ch. 7	Discuss review questions in the tutorial on memory management and algorithms. Graded.
8 02 Jan (Tue)	Virtual memory	Ch. 8	Discuss review questions in the tutorial on demand paging and virtual memory. Graded.
9 08 Jan	File management	Ch. 12	Discuss review questions in the tutorial on internal file structure. Graded. **Deferred mid trimester exams** - see Section 2.6 below for more information **Assignment 4 due: Report.** Summative worth 15%
10 15 Jan	I/O management and disk scheduling	Ch. 11	Discuss review questions in the tutorial based on input output management and scheduling. Graded. **Assignment 4 due: Presentation**. Summative worth 10%
11 22 Jan	Operating system security	Ch. 15	Discuss review questions in the tutorial on cryptography and encryption. Graded. **Assignment 4 due: Presentation.** Summative worth 10%

12 29 Jan	Revision & preparation for final exam	All Chapters	Revision
13 05 Feb	Study Review Week and Final Exam Week		
14 12 Feb	Examinations Continuing students - enrolments for T124 open		Please see exam timetable for exam date, time and location
15 19 Feb	Student Vacation begins New students - enrolments for T124 open		
16 26 Feb	- Results Released - Review of Grade Day for T323 – see Sections 2.6 and 3.2 below for relevant information. - Certification of Grades NOTE: More information about the dates will be provided at a later date through Moodle/KOI email.		
T124 4 Mar 2024			
1 04 Mar	Week 1 of classes for T124		

2.5 Teaching Methods/Strategies

Briefly described below are the teaching methods/strategies used in this subject:

- o *Lectures* (2 hours/week) are conducted in seminar style and address the subject content, provide motivation and context and draw on the students' experience and preparatory reading.
- o *Tutorials* (2 hours/week) include class discussion of case studies and research papers, practice sets and problem-solving and syndicate work on group projects. Tutorials often include group exercises and so contribute to the development of teamwork skills and cultural understanding. Tutorial participation is an essential component of the subject and contributes to the development of many of the graduate attributes (see section 2.2 above). Tutorial participation contributes towards the assessment in many subjects (see details in Section 3.1 for this subject). Supplementary tutorial material such as case studies, recommended readings, review questions etc. will be made available each week in Moodle.
- o *Online* teaching resources include class materials, readings, model answers to assignments and exercises and discussion boards. All online materials for this subject as provided by KOI will be found in the Moodle page for this subject. Students should access Moodle regularly as material may be updated at any time during the trimester
- o *Other contact* - academic staff may also contact students either via Moodle messaging, or via email to the email address provided to KOI on enrolment.

2.6 Student Assessment

Assessment is designed to encourage effective student learning and enable students to develop and demonstrate the skills and knowledge identified in the subject learning outcomes. Assessment tasks during the first half of the study period are usually intended to maximise the developmental function of assessment (formative assessment). These assessment tasks include weekly tutorial exercises (as indicated in the weekly planner) and low stakes graded assessment (as shown in the graded assessment table). The major assessment tasks where students demonstrate their knowledge and skills (summative assessment) generally occur later in the study period. These are the major graded assessment items shown in the graded assessment table.

Final grades are awarded by the Board of Examiners in accordance with KOI's Assessment and Assessment Appeals Policy. The definitions and guidelines for the awarding of final grades within the BIT degree are:

o HD High distinction (85-100%) an outstanding level of achievement in relation to the assessment process.

o DI Distinction (75-84%) a high level of achievement in relation to the assessment process.

o CR Credit (65-74%) a better than satisfactory level of achievement in relation to the assessment process.

o P Pass (50-64%) a satisfactory level of achievement in relation to the assessment process.

o F Fail (0-49%) an unsatisfactory level of achievement in relation to the assessment process.

o FW This grade will be assigned when a student did not submit any of the compulsory assessment items.

Provided below is a schedule of formal assessment tasks and major examinations for the subject.

Assessment Type	When Assessed	Weighting	Learning Outcomes Assessed
Assignment 1: Weekly Tutorial submissions (10 Weeks)	Weeks 2 – 11	10%	a, b, c, d
Assignment 2: Formative Assessment: Quiz	Week 4	0%	a
Assignment 3: Mid Trimester Examination (1 hour)	Week 6	15%	a, b
Assignment 4: Analysis of an operating system scenario and report, presentation (2,000 words)	Report: Week 9 Presentation: Weeks 10-11	15% 10% Total: 25%	b, c
Assignment 5: Final examination On-campus: 2 hours + 10 mins reading time Online: 2 hours + 30 mins technology allowance	Final Exam Period	50%	a, b, c, d

Requirements to Pass the Subject:

To gain a pass or better in this subject, students must gain a *minimum of 50%* of the total available subject marks.

2.7 Prescribed and Recommended Readings

Provided below, in formal reference format, is a list of the prescribed and recommended readings.

Prescribed Text:

Stallings, W 2018, *Operating Systems: Internals and Design Principles,* Global 9th Edition, Pearson Education Limited, Harlow, United Kingdom. Available from: ProQuest Ebook Central. [17 June 2020].

Recommended Readings:

Silberschatz, A., Galvin, P.B. and Gagne, G., 2019. *Silberschatz's Operating system concepts.* [e-book] Tenth edition] global edition ed. Hoboken, NJ: Wiley. Available through: unknown <https://www.wiley.com/en-au/Silberschatz's+Operating+System+Concepts,+10th+Edition,+Global+Edition-p-9781119455868>.

Tomsho, G., 2021. *Guide to operating systems.* [e-book] Sixth edition, student edition ed. Boston, Ma: Cengage. Available through: unknown <https://au.cengage.com/c/isbn/9780357710067/>.

Journals:

C. Qi and C. Li, "A Solution Design for Solving Road Deadlock in Autonomous Driving," 2022 13th International Conference on Information and Communication Technology Convergence (ICTC), Jeju Island, Korea, Republic of, 2022, pp. 455-457, doi: 10.1109/ICTC55196.2022.9952591.

H. Zhang and X. Wang, "Evaluating the Speedup of Multicore Architecture on the Topological Characteristics of On-chip Memory," 2021 International Conference on Computer Engineering and Artificial Intelligence (ICCEAI), Shanghai, China, 2021, pp. 502-506, doi: 10.1109/ICCEAI52939.2021.00098.

L. Yuanhong, 2019. Optimal selection of tests for fault detection and isolation in multi-operating mode system*: Journal of Systems Engineering and Electronics.*[e-]. 30 (2) pp.425-434. 10.21629/JSEE.2019.02.20.

M. S. Elsayed, G. Liu, A. M. Mostafa, A. A. Alnuaim and P. E. Kafrawy, "Fault-Recovery and Robust Deadlock Control of Reconfigurable Multi-Unit Resource Allocation Systems Using Siphons," in IEEE Access, vol. 9, pp. 67942-67956, 2021, doi: 10.1109/ACCESS.2021.3073639.

M. Yang, W. Huang and J. Chen, 2019. Resource-Oriented Partitioning for Multiprocessor Systems with Shared Resources : *IEEE Transactions on Computers.*[e-]. 68 (6) pp.882-898. 10.1109/TC.2018.2889985.

S. Nour, S. A. Habashy and S. A. Salem, "Energy Optimization by Using Last Level Cache Partitioning for Multicore Platforms," 2021 16th International Conference on Computer Engineering and Systems (ICCES), Cairo, Egypt, Egypt, 2021, pp. 1-6, doi: 10.1109/ICCES54031.2021.9686175.

V. Ruchkin, G. Soldatov, A. Koryachko, B. Kostrov and E. Ruchkina, "Conceptual Model of Hardware & Software Co-design for Multicore Systems on Chip," 2020 9th Mediterranean Conference on Embedded Computing (MECO), Budva, Montenegro, 2020, pp. 1-4, doi: 10.1109/MECO49872.2020.9134207.

Journal References:

o   International Journal of Security and Networks
o   International Journal of Security and Its Applications
o   ACM Transactions on Computer Systems
o   Computer Science: Research and Development

Conference/ Journal Articles:

Students are encouraged to read peer reviewed journal articles and conference papers. Google Scholar provides a simple way to broadly search for scholarly literature. From one place, you can search across many disciplines and sources: articles, theses, books, abstracts and court opinions, from academic publishers, professional societies, online repositories, universities and other web sites.