ICT102 INTRODUCTION TO PROGRAMMING T326 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) Diploma in Information Technology (DIT)	1 trimester	Level 1	Mr Apel Mahmud apel.mahmud@koi.edu.au P: +61 (2) 9283 3583 L: 7-11, 11 York St. Consultation: via Moodle or by appointment.

1.2 Core / Elective

Core subject for BIT
Core subject for DIT

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) DIT (32 Credit Points)

1.4 Student Workload

The expected student workload per week for this subject is indicated below.

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 and completing assignments.
*** That is, * + ** = workload hours.

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 Nil

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1.7 General Study and Resource Requirements

- Dedicated computer laboratories are available for student use. Normally, tutorial classes are conducted in the computer laboratories.
- 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.
- 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.
- 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: Students will need computers with relevant software installed to complete their tutorial exercises. If you have your own computer, it should have internet access and the required software installed. Students are encouraged to make use of the campus library for reference materials. *Software Required:* Sun Java 8 JDK and NetBeans IDE, Eclipse, Office 365, MS Imagine.

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:

- Consultation times: A list of consultation hours is provided on the homepage of Moodle where appointments can be booked.
- 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.
- 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.
- 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.
- 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 an introduction to programming and the fundamental principles of programming using objects. It utilises the Java programming language and covers programming concepts such as data types, control structures, strings, files, input/output and an introduction to classes, objects and programming methods. At the end of this subject students will have an understanding of fundamental computational concepts along with a range of problem-solving techniques using the Java programming language.

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:

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	KOI Bachelor Degree Graduate Attributes	Detailed Description
	Knowledge	Current, comprehensive, and coherent and connected 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
	Leadership and 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:

- **Level 1 Foundation** – Students learn the basic skills, theories and techniques of the subject and apply them in basic, standalone contexts.
- **Level 2 Intermediate** – Students further develop the skills, theories and techniques of the subject and apply them in more complex contexts, and begin to integrate this application with other subjects.
- **Level 3 Advanced** – Students demonstrate an 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 1 subject.

On successful completion of this subject, students should be able to:

Subject Learning Outcomes	Contribution to Graduate Attributes
a) Apply general programming concepts, secure coding practices, and good programming techniques.	
b) Construct, test, and debug simple practical programs using the Java language, ensuring adherence to secure coding standards.	
c) Apply exception handling techniques to maintain program robustness and security.	

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d) Develop small applications using problem-solving, critical thinking skills, programming knowledge, and secure coding principles.	

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
Week 1 26 October	Introduction to programming and Java language	Chapter 1	Complete tutorial, end-of-chapter exercises and Introduction to NetBeans IDE environment. Formative not graded.
Week 2 02 November	Java language fundamentals, Java I/O, data types and operators	Chapter 2	Complete tutorial, end-of-chapter exercises. Run Java programs using data types and operators. Formative not graded.
Week 3 09 November	Decision structures	Chapter 3	Complete tutorial, end-of-chapter exercise. Java programs using different IF-ELSE Structures. Formative not graded.
Week 4 16 November	Loops	Chapter 4	Execute Java programs using different types of loops. Formative not graded.
Week 5 23 November	String handling	Chapter 9	Complete tutorial, end-of-chapter exercise and execute Java programs using String manipulations. Formative not graded. **Assessment 2: In-Class Quiz worth 20%**
Week 6 30 November	Arrays	Chapter 7	Execute Java programs using two dimensional arrays. Formative not graded.
Week 7 07 December	List and ArrayList	Chapter 7	Complete tutorial, end-of-chapter exercise and work on Java programs using List and ArrayList. Formative not graded.

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Week (beginning)	Topic covered in each week's lecture	Reading(s)	Expected work as listed in Moodle
			Assessment 1: Programming portfolio draft submission
Week 8 14 December	Introduction to classes and methods	Chapters 5, 6	Complete tutorial, end-of-chapter programming exercises on classes and methods. Formative not graded. **Assessment 3: In-Class Practical exam worth 30%**
Week 9 04 January	Use of classes and methods	Chapters 5, 6	Complete tutorial, end-of-chapter exercise on classes and methods. Formative not graded.
Week 10 11 January	Files I/O and streams	Chapters 4, 11	Execute Java programs using File I/O streams. Formative not graded. **Assessment 1: Programming portfolio final submission worth 15%**
Week 11 18 January	Debugging and exception handling	Chapters 11	Complete tutorial, end-of-chapter exercise on Exception handling and debugging. Formative not graded.
Week 12 25 January	Revision	All subject material	Revision **Assessment 4: Individual project worth 35%.**
Week 13 01 February	Study review week and Final Exam Week		
Week 14 08 February	- Final Exam Week - Continuing students - enrolments for T127 open		Please see the exam timetable for the exam date, time and location
Week 15 15 February	- Student Vacation begins - New students - enrolments for T127 open		
Week 16 22 February	• Results Released • Review of Grade Day for T326 – 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.		
T127 01 March 2027			

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Week (beginning)	Topic covered in each week's lecture	Reading(s)	Expected work as listed in Moodle
Week 1 01 March	Week 1 of classes for T127		

2.5 Teaching Methods/Strategies

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

- *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.
- *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.
- *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
- *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:

- HD High distinction (85-100%) an outstanding level of achievement in relation to the assessment process.
- DI Distinction (75-84%) a high level of achievement in relation to the assessment process.
- CR Credit (65-74%) a better than satisfactory level of achievement in relation to the assessment process.
- P Pass (50-64%) a satisfactory level of achievement in relation to the assessment process.
- F Fail (0-49%) an unsatisfactory level of achievement in relation to the assessment process.

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

Assessment Type	When assessed	Weighting	Learning Outcomes Assessed
Assessment 1: Programming portfolio	**Draft:** Week 7 **Final submission:** Week 10	15%	a, b, c
Assessment 2: In-Class Quiz	Week 5	20%	a, b
Assessment 3: Practical exam	Week 8	30%	a, b, d
Assessment 4: Individual project	Week 12	35%	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:
Gaddis, T., 2024. *Starting Out with Java: From Control Structures through Objects*, 8th edn., Pearson Publications. ISBN: 9781292721569

Recommended Readings:

Liang, Y.D., 2025. *Introduction to Java Programming and Data Structures,* 13th edn., Global Edition. Pearson Publications. ISBN: 9781292480718

Farrell, J., 2022, *Java Programming*, 10th edn, Cengage Learning. ISBN: 9780357673423.

Horstmann, C.S., 2024. *Core Java : Volume I: Fundamentals*, 13th edn, Pearson, Boston, Mass. ISBN: 9780135328385.

Tsiotras, D. and Xinogalos, S., 2021. Investigating the perceived player experience and short-term learning of the text-based Java programming serious game "Rise of the Java Emperor". *Informatics in Education*, 20(1), pp.153–170. doi: https://doi.org/10.15388/infedu.2021.08

Suggested Conference/ Journal Articles:

Ling, H.C., Hsiao, K.L. and Hsu, W.C., 2021. Can students' computer programming learning motivation and effectiveness be enhanced by learning Python language? A multi-group analysis. *Frontiers in Psychology*, 11, p.600814. doi:10.3389/fpsyg.2020.600814.

Weill-Tessier, P., Costache, A.L. and Brown, N.C., 2021. Usage of the Java language by novices over time: Implications for tool and language design. *Proceedings of the 52nd ACM Technical Symposium on Computer Science Education*. doi:10.1145/3408877.3432408.

Martinez, D., Remegio, A. and Lincopinis, D., 2023. A Review on Java Programming Language. URL: https://www.researchgate.net/publication/371166744_A_Review_on_Java_Programming_Language

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Hamaamin, R.A., Ali, O.M.A. and Kareem, S.W., 2024. Java programming language: Time permanence comparison with other languages: A review. *ITM Web of Conferences*, 64, p.01012. doi:10.1051/itmconf/20246401012.

Online Resources:

- https://www.w3schools.com/java/default.asp
- https://www.linkedin.com/learning/java-essential-training-for-students
- https://www.tutorialspoint.com/java/index.htm
- Secure Coding Guidelines for Java SE

Best practices link by Oracle are as follows:

- https://www.oracle.com/java/technologies/javase/seccodeguide.html
- Guideline 0-2 / FUNDAMENTALS-2: Avoid duplication
- Guideline 0-6 / FUNDAMENTALS-6: Encapsulate

ACS recommended links:

- Professional Ethics, Conduct & Complaints
- New ACS Code of Professional Ethics
- Rules & Regulations

Security and Privacy recommended links:

- https://www.ibm.com/au-en
- https://cpl.thalesgroup.com/
- https://www.checkpoint.com/

References available from EBSCOhost research databases:

ACM Transactions on Computer Systems

ACM Transactions On Programming Languages & Systems

Recommended references:

Journal of Functional and Logic Programming
Journal of Functional Programming
International Journal of Parallel Programming

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.

Useful Websites:

The following websites are useful sources covering a range of information relevant to this subject. Students are also expected to use the library and the internet.

- http://java.sun.com/docs/codeconv
- http://java.sun.com/docs/books/tutorial/index.html
- http://codingbat.com/
- http://www.tutorialspoint.com/java

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