ICT701 PROGRAMMING FUNDAMENTALS 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
Master of Information Systems (MIS) Graduate Diploma of Information Systems (GDIS) Graduate Certificate of Information Systems (GCIS)	1 trimester	Level 8 Graduate Certificate	Name: Dr Jnanamurthy Email: jnanamurthy.hk@koi.edu.au P: 92833583 (Ext.156) L: Level 7-11, 11 York St Consultation: via Moodle or by appointment

1.2 Core / Elective
This subject is a core subject for MIS, GCIS and GCIS.

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	MIS (64 Credit Points); GDIS (32 Credit Points); GCIS (16 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***
3 hours/week plus supplementary online material	7 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 There are no pre-requisites for this subject.

1.7 General Study and Resource Requirements

- Students are expected to attend classes with the required textbook and to read specific chapters

prior to the tutorials. Students should read this material before coming to class to improve their ability to participate in the weekly activities.
- Students will require access to the internet and their KOI email and should have basic skills in word processing software such as MS Word, spreadsheet software such as MS Excel and visual presentation software such as MS PowerPoint.
- 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.

Software resource requirements specific to this subject:

Anaconda navigator, Jupyter Notebook 5.5.0, Python 3, 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 introduces the basics of programming including data and control structures as well as the use of functions and classes. Fundamental program design principles are discussed and applied to solve problems using the high-level procedural language Python. Object-oriented programming principles are presented for effective problem solving and algorithmic designing. Students explore practical applications in developing programs that include the use of graphical user interfaces and graphics.

2.2 Graduate Attributes for Undergraduate Courses

Graduates of Postgraduate courses from King's Own Institute will achieve the graduate attributes expected from successful completion of a Master's degree under the Australian Qualifications Framework (2nd edition, January 2013). Graduates at this level will be able to apply an advanced 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 master's level degree are summarised below:

	KOI Master's Degree Graduate Attributes	**Detailed Description**

	Knowledge	Current, comprehensive and coherent knowledge, including recent developments and applied research methods
	Critical Thinking	Critical thinking skills to identify and analyse current theories and developments and emerging trends in professional practice
	Communication	Communication and technical skills to analyse and theorise, contribute to professional practice or scholarship and present ideas to a variety of audiences.
	Research and Information Literacy	Cognitive and technical skills to access and evaluate information resources, justify research approaches and interpret theoretical propositions
	Creative Problem Solving Skills	Cognitive, technical and creative skills to investigate, analyse and synthesise complex information, concepts and theories, solve complex problems and apply established theories to situations faced in professional practice.
	Ethical and Cultural Sensitivity	Appreciation and accountability for ethical principles, cultural sensitivity and social responsibility, both personally and professionally
	Leadership and Strategy	Initiative, leadership skills and ability to work professionally and collaboratively to achieve team objectives across a range of team roles. Expertise in strategic thinking, developing and implementing business plans and decision making under uncertainty
	Professional Skills	High level personal autonomy, judgement decision-making and accountability required to begin professional practice.

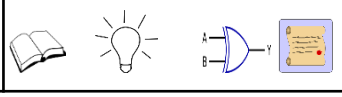
Across the course, these skills are developed progressively at three levels:

- **Level 1 Foundation –** Students learn the skills, theories and techniques of the subject and apply them in stand-alone contexts.
- **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.
- **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

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

Subject Learning Outcomes	Contribution to Course Graduate Attributes

a) Evaluate the use of data and control structures using the programming language Python	
b) Design, test and document programs based on the given requirements	
c) Combine functions and classes for structuring programs according to the requirements	
d) Develop real world applications consisting of graphical user interfaces and graphics	
e) Employ problem-solving techniques based on object-oriented principles using Python	

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
Week 1 26 October	Introduction: Basic features of an algorithm, computer architecture, history of computing, composition and running a simple Python program	Chapter 1	Tutorial exercises on composition and running a simple Python program Formative not graded
Week 2 02 November	Software development, data types, and expressions	Chapter 2	Tutorial exercises on use of data types and expressions for solving any problem Formative not graded
Week 3 09 November	Loops: For and while loops to repeat actions, traverse lists, count up and down, and generate random numbers	Chapter 3	Tutorial exercises on for and while loops for effective repetition of code execution Formative not graded
Week 4 16 November	Selection statements: one-way selection statements (if), two-way selection statements (if-else), and multi-way selection statements	Chapter 4	Tutorial exercises on selection statements and appropriate use of each type of statement Formative not graded **Assessment 1 (Quiz) due**

Week 5 23 November	Strings and text files: Use and manipulate strings and use of string methods, create, read from, and write to text files and use of library functions to access and navigate a file system	Chapter 5	Tutorial exercises on use of different string methods according to the requirements and on using text Files for reading and writing of data Formative not graded
Week 6 30 November	Lists: Construct, use, and manipulate lists	Chapter 6	Tutorial exercises related to lists using methods for copying, changing, sorting and applying mathematical operations Formative not graded **Assessment 2 due**
Week 7 07 December	Dictionaries: Construct, use, and manipulate dictionaries	Chapter 7	Tutorial exercises related to dictionaries using methods for creating, changing, deleting, sorting, merging and applying mathematical operations Formative not graded
Week 8 14 December	Design with functions: Role of functions in structuring code, employing top-down design to assign tasks to functions	Chapter 8	Tutorial exercises on creating and using functions considering effective code writing practices Formative not graded
Week 9 04 January	Simple graphics and image processing: Basic concepts of RGB system, analogue and digital information, and sampling. Working with graphics through many examples using two non-standard, open-source modules: turtle and images	Chapter 9	Feedback on draft of assessment 3 Tutorial exercises on functions continue this week with emphasis on code structure Formative not graded
Week 10 11 January	Graphical user interfaces: Structure of a GUI-based program, instantiate and lay out different types of window objects, including labels, entry fields, and command buttons, in a window's frame. Events and event-driven programming	Chapter 10	Tutorial exercises on graphics and image processing related to copying, converting, blurring and reducing images Formative not graded **Assessment 3 due**
Week 11 18 January	Design with classes: Introduction to objects and classes for object-oriented design and related concepts of constructors, instance variables, methods, inheritance, polymorphism, and encapsulation	Chapter 11	Tutorial exercises on designing Graphical User Interfaces using labels, command buttons and entry fields Formative not graded

Week 12 25 January	Design with classes continued. Revision	Chapter 12	Tutorial exercises on classes and different fundamental concepts of OO design Formative not graded **Assessment 4 due**
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			
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:

- *Sessions* (3 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. Sessions include class discussion of case studies and research papers, practice sets and problem-solving and syndicate work on group projects. Sessions often include group exercises and so contribute to the development of teamwork skills and cultural understanding. Session participation is an essential component of the subject and contributes to the development of many of the graduate attributes (see section 2.2 above). Session participation contributes towards the assessment in many subjects (see details in Section 3.1 for this subject). Supplementary session 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 assessments (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 are:

- HD High distinction (85-100%): an outstanding level of achievement in relation to the assessment process.
- D Distinction (75-84%): a high level of achievement in relation to the assessment process.
- C 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.
- 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**
Assessment 1: Quiz (In-class, face-to-face)	Week 4	10%	a, b, c
Assessment 2: Individual Assignment	Week 6	20%	a, b, c
Assessment 3: Group Assignment	Week 10	35%	a, b, c, d, e
Assessment 4: Advanced Individual Assignment (including an in-class demonstration)	Week 12	35%	a, b, c, d, e

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 Texts:

Lambert, K. A. (2024). *Fundamentals of Python: First programs* (3rd ed.). Cengage Learning. ISBN: 9780357881125.
https://au.cengage.com/c/fundamentals-of-python-first-programs-3e-lambert/9780357881019/

Recommended Readings:

Landau, R. H., Páez, M. J., & Bordeianu, C. C. (2024). *Computational physics: Problem solving with Python* (4th ed.). John Wiley & Sons. ISBN: 9783527843312.
https://www.wiley.com/en-au/Computational+Physics%3A+Problem+Solving+with+Python%2C+4th+Edition-p-9783527843312

Shaw, Z. A. (2024). *Learn Python the hard way*. Addison-Wesley Professional. ISBN-13: 9780138270582. https://www.dymocks.com.au/learn-python-the-hard-way-by-zed-shaw-9780138270575

Theobald, O. (2025). *Python for absolute beginners: A complete guide to master Python programming with hands-on examples and exercises*. Packt Publishing. ISBN-13: 9798748393300.
https://www.oreilly.com/library/view/python-for-absolute/9781806385119/

Xu, J., & Frydenberg, M. (2021). Python programming in an IS curriculum: Perceived relevance and outcomes. *Information Systems Education Journal, 19*(4), 37–54.
https://isedj.org/2021-19/n4/ISEDJv19n4p37.html

Suggested Periodicals:

The Python Papers Anthology. http://ojs.pythonpapers.org/

Python Weekly. https://www.pythonweekly.com/

Pycoders' Weekly. https://pycoders.com/

Useful Websites
The following websites are useful sources covering a range of information useful for this subject. However, most are not considered to be sources of Academic Peer Reviewed theory and research. If your assessments require ***academic peer reviewed journal articles*** as sources, you need to access such sources using the library database, EBSCOhost, or Google Scholar. Please ask in the library if you are unsure how to access EBSCOhost. Instructions can also be found in Moodle.

- Python.org: https://www.python.org
- Web python: http://webpy.org
- Documentation https://docs.python.org/3/index.html