ICT 200 DATABASE DESIGN AND DEVELOPMENT T320 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	Anupam Makhija anupam.makhija@koi.edu.au P: 92833583 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 containing 1 x 2 hour Lecture 1 x 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 Blended, that is face-to-face/online

1.6 Pre-requisites ICT 103 Systems Analysis and Design

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.

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- 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.

Software Resource requirements specific to this subject: Office 365, MS Imagine, SQL Server 2017.

2. Academic Details

2.1 Overview of the Subject

This subject will provide the student with an overall understanding of database development, concepts and theory. Students will learn to design and build a database from data analysis, normalisation, mapping a specific database model. The relational model is emphasised and introduced using structured queried language (SQL) for creating and manipulating databases in both MS Access and SQL Server environments. Assignment work includes the analysis, design, and implementation of a database using SQL queries in SQL Server environment.

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 across a range of contexts for the purposes of professional practice or academic scholarship, and as a pathway for further learning. King's Own Institute's key generic graduate attributes for a Bachelor's level degree are summarised below:

	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
	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 2 subject.

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

Subject Learning Outcomes	Contribution to Graduate Attributes
a) Explain the history and development of database technologies and the emergence of the relational database model and SQL.	
b) Model business information requirements and produce a logical database design using entity relationship diagrams (ERD) and extended relationship diagrams (EERD).	
c) Design, develop, test and prove the functionality of a database using MS Access and SQL.	
d) Describe and carry out the necessary steps to develop an effective physical database design	
e) Formulate, write and execute SQL queries in an SQL Server environment.	
f) Explain the main functions of database administration and data warehousing.	

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 02 Nov	Introduction to DBMS: ○ history of database processing ○ emergence of relational model ○ post-relational developments ○ DBMS concepts ○ MS Access and SQL	Ch.1 and Database History Article (See section 2.6)	Chapter 1 Discussion. Formative Introduction to MS Access and SQL environments.
2 09 Nov	Introduction to Structured Query Language: ○ creating SQL statements ○ using SQL in MS Access ○ using SQL in SQL Server ○ Querying tables	Ch.2	Activities, Database exercises - execute simple SQL queries in MS Access and SQL Server. Formative. Tutorial exercises
3 16 Nov	Data modelling with the Entity-Relationship model: ○ purpose of a data model ○ the E-R model and diagrams ○ variations of the E-R model ○ entities and data modelling process	Ch.5	Activities, Data Modelling ERD exercises. VISIO and UML (Appendix C and D). Formative Tutorial exercises

4 23 Nov	The relational model and normalisation: ○ terminology ○ characteristics of relationships ○ normal forms normalisation categories	Ch.3	Activities, Normalisation exercises on 1NF, 2NF, 3NF and BCNF. Formative Tutorial exercises
5 30 Nov	Database design using normalisation: ○ advantages and disadvantages ○ normalising with SQL ○ common design problems	Ch.4	Simple SQL Activities, normalisation and de-normalisation exercises. Formative. Tutorial exercises **Assessment 2 Quiz**
6 07 Dec	Transforming data models into database designs: ○ purpose of database design ○ tables, entities, primary/alternate keys ○ verify normalisation ○ create relationships ○ design for minimum cardinality	Ch.6	Activities creating tables and relationship in SQL, Database Design exercises. Formative. Database Exercises from textbook**.**
7 14 Dec	SQL for database construction and application processing: ○ using SQL scripts ○ Advanced SQL statements	Ch.7	Chapter Activities complex SQL queries using join, union, sub-queries. Tutorial exercises Formative
20 Dec 2020 – 03 Jan 2021	**Mid trimester break**		
8 04 Jan	Database redesign: ○ the need for database redesign ○ analysing existing databases ○ database backup and test databases ○ making changes to tables, columns, constraints, cardinalities, relationships	Ch. 8	Chapter Activities Testing database and query optimisation for database efficiency. Formative Tutorial exercises
9 11 Jan	Managing multiuser databases: ○ database administration ○ DBMS and application security ○ database backup and recovery ○ managing the DBMS and data repository	Ch.9	Tutorial exercises Chapter Activities Formative **Assessment 3: Practical Test**
10 18 Jan	Managing databases with Microsoft SQL server: ○ installing the DBMS ○ using the DBMS utilities ○ creating a database ○ creating and running SQL scripts ○ DBMS security	Ch.10	Tutorial exercises **Assessment 4 due: Report**

11 25 Jan	The web server environment: ○ the web database processing environment ○ database server access standards ○ OBDC standard ○ web database processing with PHP and NetBeans IDE ○ challenges and SQL injection attacks ○ the importance of XML	Ch.11	Tutorial exercises SQL Server Project. Formative **Assessment 4 due: Presentation**
12 01 Feb	Big data, data warehousing and business intelligence systems: ○ business intelligence systems ○ reporting and data mining systems ○ data warehousing and data marts ○ components of a data warehouses ○ OLAP and data mining ○ distributed databases ○ cloud computing ○ big data and the Not Only SQL movement	Ch.12	Discussion. Formative. Tutorial exercises
13 07 Feb	Study Review Week		
14 15 Feb	Final Exam Week	Please see Exam Timetable for exam date, time and location	
15 21 Feb	Student Vacation begins Enrolments for T121 open		
16 02 Mar	Results Released 02 Mar 2021 Certification of Grades 05 Mar 2021		
T121 begins 09 Mar 2021			
1 08 Mar	Week 1 of classes for T121 **Friday 05 Mar 2021 – Review of Grade Day for T320** – see Sections 2.6 and 3.2 below for more information.		

2.7 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.

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Grading:

Final grades are awarded by the Faculty Assessment Committee in accordance with KOI's Assessment Regulations. 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.
- PS - Pass (50-64%) a satisfactory level of achievement in relation to the assessment process.
- FL - Fail (0-49%) an unsatisfactory level of achievement in relation to the assessment process.

2.8 Student Assessment

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 Weekly Tutorial	Week 2 - 11	10%	a, b, c, d, e, f
Assessment 2 Quiz (opens week 5)	Week 5	5%	a
Assessment 3 Practical Test	Week 9	10%	d
Assessment 4 Group Project (Report and Presentation /Demonstration)	Weeks 11 Week 10 - 11	Report 15% Presentation 5% Demonstration 5% Total:25%	d, e
Assessment 5 Final Exam (2,5 hours plus 10 minutes reading time)	Final exam period	50%	b, c, d, e, f

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.

2.9 Prescribed Readings

Prescribed Text:

Kroenke, DM, & Auer, D 2016, *Database Processing: Fundamentals, Design, and Implementation*, Global Edition, Pearson Education Limited, Harlow. Available from: ProQuest Ebook Central. [17 June 2020].