

31253 Database Programming

Course area UTS: Information Technology

Delivery Autumn 2020; City

Credit points 6cp

Requisite(s) [31271](#) Database Fundamentals OR [31061](#) Database Principles OR [31474](#) Database Fundamentals OR [31487](#) Database Management Systems

Result type Grade and marks

Attendance: 3hpw (2hr lecture, 1hr tutorial)

Recommended studies: It is assumed that students are familiar with basic database concepts; familiarity with the SQL language is mandatory and previous experience with at least one higher-level programming language is required.

Subject coordinator

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Contact hours: Mon-Fri 9am-5pm by appointment

Teaching staff

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Questions regarding assessment or content within the subject are welcome in lectures or tutorials or alternatively post them to the discussion board in UTSONline. This helps ensure that all students get the benefit of the answers given.

The Subject Coordinator may be contacted by email if you have matters of a personal nature to discuss, e.g., illness, study problems, and for issues to do with extensions, group problems or other matters of importance.

All email sent to subject coordinators, tutors or lecturers must have a clear subject line that states the subject number followed by the subject of the email [e.g. Subject 32702, Request for Extension], and must be sent from your UTS email address.

Consultation hours: Check the UTSONline Contact section for details on consultation hours. Requests for appointments outside the given consultation hours may be arranged where circumstances require, and to do so please contact the subject coordinator by email.

Subject description

This subject teaches students how to design, develop and evaluate database programming and administration solutions to meet pre-defined quality characteristics of functionality (suitability, security), usability (operability), efficiency (time behaviour, resource utilisation), and maintainability (changeability, testability). Database programming and administration solutions are implemented using Oracle 11G, SQL*Plus and PL/SQL. Concepts, theories and technologies underlying the methods and techniques are introduced and explained as required. Students apply all that they have learnt to develop a small application to solve a database problem.

Subject learning objectives (SLOs)

Upon successful completion of this subject students should be able to:

1. Be able to describe the benefits of Database Programming
2. Understand programming constructs available in PL/SQL.
3. Understand how triggers, stored procedures and stored functions and database packages operate.
4. Understand the current development methodology in modern database systems
5. Describe the use of supplied packages in the Oracle database
6. Have a basic understanding of the roles and responsibilities of a database administrator

Course intended learning outcomes (CILOs)

This subject also contributes specifically to the development of the following Course Intended Learning Outcomes (CILOs):

- Socially Responsible: FEIT graduates identify, engage, interpret and analyse stakeholder needs and cultural perspectives, establish priorities and goals, and identify constraints, uncertainties and risks (social, ethical, cultural, legislative, environmental, economics etc.) to define the system requirements. (B.1)
- Design Oriented: FEIT graduates apply problem solving, design and decision-making methodologies to develop components, systems and processes to meet specified requirements. (C.1)

Teaching and learning strategies

Each week there will be a 2-hour lecture and a 1-hour tutorial/lab. Lab sessions will be used to support the lectures with illustrative examples and exercises. Lecture and tutorial will be in one session.

Content (topics)

1. Introduction to Database Programming, revision of SQL and an introduction to SQL*Plus, iSQL*Plus and the development tool SQL Developer
2. PL/SQL language fundamentals, variables and built in functions
3. Database procedures, functions, triggers and packages
4. Error and exception handling
5. File input/output from the database
6. Introduction and awareness of performance tuning
7. Database administration

Program

Week/Session	Dates	Description
1	11 Mar	Lecture 1: Introduction to the Subject: Overview of SQL Developer and the Oracle Database, Revision of SQL Notes: Lecture and tutorial will be in one session
2	18 Mar	Lecture 2: Introduction to PL*Sql fundamentals, Variables, Literals and Built-in functions. Commenting. Effective coding style. Blocks and Scope of Variables. Compiling and Debugging. Tutorial 1 Notes: Assignment specification given out

3	25 Mar	Lecture 3: Control Flow. Loops. Cursor FOR Loops. Managing Loops Tutorial 2
4	1 Apr	Lecture 4: Database Procedures and Functions. Triggers. Parameters in and out. Calling Functions and Procedures through SQL*Plus and code. Tutorial 3
5	8 Apr	Lecture 5: Exceptions. Built in and User Defined Exceptions. Propagation of Exceptions. Exception Handling, Transactions and Autonomous Transactions Tutorial 4 (Census Date)
6	15 Apr	Lecture 6: Cursors (Explicit and Implicit). Defining, manipulating and fetching rows from a cursor. Record Types, Table Row Records. Assigning Rows to records. Tutorial 5
	22 Apr	StuVac
7	29 Apr	Lecture 7: Packages. Declaring, Structure, Specification and Body. Data initialization. Private and Public modules and Variables. Tutorial 6.
8	6 May	Lecture 8: Built in Packages. File Input/Output (UTIL_FILE) Tutorial 7
9	13 May	Lecture 9: Performance Tuning. The Optimizer and the EXPLAIN plan Tutorial 8
10	20 May	Lecture 10: Database Administration Part 1 Tutorial 9
11	27 May	Lecture 11: Database Administration Part 2 Tutorial 10 Notes: Assignment Due (by 27/05/2020, 11:59pm)
12	3 Jun	Lecture 12: Revision of the Subject and Discussion of the Exam Tutorial 11

Assessment

Assessment task 1: Assignment

- Intent:** The students should be able to analyse the business requirements specified, then build a robust database centric application to meet the business requirements. PL*SQL will be the programming language and the program will be stored in the students schema in the ORACLE database.
- Objective(s):** This assessment task addresses the following subject learning objectives (SLOs):
1, 2, 3, 4 and 5
This assessment task contributes to the development of the following Course Intended Learning Outcomes (CILOs):
B.1 and C.1
- Type:** Exercises
- Groupwork:** Individual
- Weight:** 50%
- Task:** The assignment is an individual effort and involves the development of a small automated application to solve a business problem.
Students will need to have a compiled and working version of the Assignment code in their schema in the database. Additionally, a design document and a copy of the Assignment code must be submitted to UTSONline under the Assignment Task 1 module by the due date and time.
- Due:** 11.59pm Wednesday 27 May 2020

Assessment task 2: Final Examination

- Intent:** The open book exam will test the students' knowledge of the tasks covered during the session. The exam will focus on the students understanding of the programming environment that has been studied during the session.
- Objective(s):** This assessment task addresses the following subject learning objectives (SLOs):
1, 2, 3, 4, 5 and 6
This assessment task contributes to the development of the following Course Intended Learning Outcomes (CILOs):
B.1 and C.1
- Type:** Examination
- Groupwork:** Individual
- Weight:** 50%
- Task:** The exam is held during the usual session examination time
- Due:** UTS Exam period

Moderation of marks

Benchmarking of marking standards are used at the commencement of marking to assist markers to apply the criteria in a consistent manner.

Assessment feedback

Multiple forms of feedback will be provided to students in this subject including:

- Formative Feedback: Verbal Feedback in relation to students' questions, comments, class participation, and tutorial activities, as well as generic feedback on assessment tasks. Students are advised to take note of this feedback on a weekly basis, and use it to inform their decision in relation to enrolment by census date and throughout the session.
- Summative Feedback: Students will receive marks on assignment, and the final exam, which will determine whether they meet the requirements for the subject.

A marking sheet will be returned to the students with feedback on the Assignment within two weeks after the submission due. Should you wish to challenge the marks given for the Assignment, contact the marker but please bring the marking sheet with you and address the issues on the marking sheet.

Minimum requirements

In order to pass the subject, a student must achieve an overall mark of 50% or more.

Required texts

Prescribed Text 978-0-596-51446-4

Oracle PL/SQL Programming (5th Edition) ISBN 978-0-596-51446-4

by Steven Feuerstein with Bill Pribyl

Published by O'Reilly and Associates Inc.

References

Other References

1. OTN - Oracles On Line Help System
2. Oracle PL/SQL by Example (Third Edition) ISBN 0-13-117261-1

By Benjamin Rosenzweig and Elena Silvestrova Published by Prentice Hall

Graduate attribute development

For a full list of the faculty's graduate attributes refer to the FEIT [Graduate Attributes](#) webpage.

For the contribution of subjects taken in the Bachelor of Engineering (Honours) or Master of Professional Engineering to the Engineers Australia Stage 1 Competencies, see the faculty's [Graduate Attributes and the Engineers Australia Stage 1 Competencies](#) webpage.

Assessment: faculty procedures and advice

Marking criteria

Marking criteria for each assessment task will be available on the Learning Management System: [UTS Online](#).

Extensions

When, due to extenuating circumstances, you are unable to submit or present an assessment task on time, please contact your subject coordinator before the assessment task is due to discuss an extension. Extensions may be granted up to a maximum of 5 days (120 hours). In all cases you should have extensions confirmed in writing.

Special consideration

If you believe your performance in an assessment item or exam has been adversely affected by circumstances beyond your control, such as a serious illness, loss or bereavement, hardship, trauma, or exceptional employment demands, you may be eligible to apply for [Special Consideration](#).

Late penalty

Work submitted late without an approved extension is subject to a late penalty of 10 per cent of the total available marks deducted per calendar day that the assessment is overdue (e.g. if an assignment is out of 40 marks, and is

submitted (up to) 24 hours after the deadline without an extension, the student will have four marks deducted from their awarded mark). Work submitted after five calendar days is not accepted and a mark of zero is awarded.

For some assessment tasks a late penalty may not be appropriate – these are clearly indicated in the subject outline. Such assessments receive a mark of zero if not completed by/on the specified date. Examples include:

- a. weekly online tests or laboratory work worth a small proportion of the subject mark, or
- b. online quizzes where answers are released to students on completion, or
- c. professional assessment tasks, where the intention is to create an authentic assessment that has an absolute submission date, or
- d. take-home papers that are assessed during a defined time period, or
- e. pass/fail assessment tasks.

Querying results

If you wish to query the result of an assessment task or the final result for a subject:

- Assessment task: [query the result](#) with the Subject Coordinator within 5 working days of the date of release of the result
- Final subject result: submit an [application for review](#) within 5 working days of the official release of the final subject result.

Academic liaison officer

[Academic liaison officers](#) (ALOs) are academic staff in each faculty who assist students experiencing difficulties in their studies due to: disability and/or an ongoing health condition; carer responsibilities (e.g. being a primary carer for small children or a family member with a disability); and pregnancy.

ALOs are responsible for approving adjustments to assessment arrangements for students in these categories. Students who require adjustments due to disability and/or an ongoing health condition are requested to discuss their situation with an accessibility consultant at the [Accessibility Service](#) before speaking to the relevant ALO.

Statement about assessment procedures and advice

This subject outline must be read in conjunction with the [Coursework Assessments policy and procedures](#).

Statement on copyright

Teaching materials and resources provided to you at UTS are protected by [copyright](#). You are not permitted to re-use these for commercial purposes (including in kind benefit or gain) without permission of the copyright owner. Improper or illegal use of teaching materials may lead to prosecution for copyright infringement.

Statement on plagiarism

Plagiarism and academic integrity

At UTS, plagiarism is defined in [Rule 16.2.1\(4\)](#) as: 'taking and using someone else's ideas or manner of expressing them and passing them off as ... [their] own by failing to give appropriate acknowledgement of the source to seek to gain an advantage by unfair means'.

The definition infers that if a source is appropriately referenced, the student's work will meet the required academic standard. Plagiarism is a literary or an intellectual theft and is unacceptable both academically and professionally. It can take a number of forms including but not limited to:

- copying any section of text, no matter how brief, from a book, journal, article or other written source without duly acknowledging the source
- copying any map, diagram, table or figure without duly acknowledging the source
- paraphrasing or otherwise using the ideas of another author without duly acknowledging the source
- re-using sections of verbatim text without using quote marks to indicate the text was copied from the source (even if a reference is given).

Other breaches of academic integrity that constitute cheating include but are not limited to:

- submitting work that is not a student's own, copying from another student, recycling another student's work, recycling previously submitted work, and working with another student in the same cohort in a manner that exceeds the boundaries of legitimate cooperation
- purchasing an assignment from a website and submitting it as original work

- requesting or paying someone else to write original work, such as an assignment, essay or computer program, and submitting it as original work.

Students who condone plagiarism and other breaches of academic integrity by allowing their work to be copied are also subject to student misconduct Rules.

Where proven, plagiarism and other breaches of misconduct are penalised in accordance with [UTS Student Rules Section 16 – Student misconduct and appeals](#).

Avoiding plagiarism is one of the main reasons why the Faculty of Engineering and IT is insistent on the thorough and appropriate referencing of all written work. Students may seek assistance regarding appropriate referencing through UTS: HELPS.

Work submitted electronically may be subject to similarity detection software. Student work must be submitted in a format able to be assessed by the software (e.g. doc, pdf (text files), rtf, html).

Further information about [avoiding plagiarism at UTS](#) is available.

Retention of student work

The University reserves the right to retain the original or one copy of any work executed and/or submitted by a student as part of the course including, but not limited to, drawings, models, designs, plans and specifications, essays, programs, reports and theses, for any of the purposes designated in Student Rule 3.9.2. Such retention is not to affect any copyright or other intellectual property right that may exist in the student's work. Copies of student work may be retained for a period of up to five years for course accreditation purposes. Students are advised to contact their subject coordinator if they do not consent to the University retaining a copy of their work.

Statement on UTS email account

Email from the University to a student will only be sent to the student's UTS email address. Email sent from a student to the University must be sent from the student's UTS email address. University staff will not respond to email from any other email accounts for currently enrolled students.