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| OP_logo_H_cmyk |  | Bachelor of Information Technology |

Course Directive

IN705 Databases 3

Semester 2, 2018

# Description

# This paper provides students with skills and understanding necessary to design and implement enterprise databases, and to administer database management systems. Students will become acquainted with the range of tools and platforms available for developing large databases. Students will explore current areas of research in database implementation, use and management.

# Course Information

Credits 15 credits

Prerequisites IN605 Databases 2

# Lecturer

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| Name | Nathan Rountree |
| Location | D303a |
| email | nathan.rountree@op.ac.nz |

# Course Dates

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| --- | --- |
| Term 1 (10 weeks) | 23 July – 28 September |
| Mid semester break | 1 October – 12 October |
| Term 2 (6 weeks) | 15 October – 23 November |

# Learning Outcomes

At the successful completion of this course, students will be able to:

1. Analyse a problem statement and design the database structure for an information system that will solve the problem
2. Implement a relational database design using appropriate query language and tools
3. Analyse data processing requirements or user information requirements and design views or procedures to satisfy those requirements
4. Appreciate the potential administration tasks facing a database system administrator and propose successful methods for performing those tasks
5. Be aware of important areas of current research in database theory and be able to locate and understand relevant academic work

# Indicative Content

* Application areas
* Information analysis techniques
* Survey of modern software and hardware for database construction and management
* Advanced data modelling
* Use of stored procedures
* Construction of complex queries
* Transactions and concurrency
* Advanced topics in data security
* Data mining and other processing methodologies

# Resources

* The installer for SQL Server Management Studio is available at <https://tinyurl.com/y8hpfdxl>. This can be installed freely and legally on personal machines.
* Students will be provided with a SQL Server account and a work database. Access details will be emailed to students at the start of the term.
* **Textbook & Readings**

There is no required textbook for this course. Required readings will be provided as pdf files. All readings are examinable.

It is strongly recommended that every student acquire a copy of an SQL language reference manual. Relying solely on on-line documentation for syntax problems is very inefficient.

Recommended Readings – second or first editions are **both fine**.

Clare Churcher (2008) *Beginning SQL Queries: From Novice to Professional.* Apress. Berkeley CA. ISBN: 1-59059-943-8.

Clare Churcher (2007) *Beginning Database Design*: From Novice to Professional. Apress. Berkeley ISBN: 1-59059-769-9.

# Schedule

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| --- | --- | --- | --- |
| Week | Date | Session 1 | Session 2 |
| 1 | 23-07-18 | Introduction | SQL Review |
| 2 | 30-07-18 | Conceptual Modelling | Logical Modelling |
| 3 | 06-08-18 | Assignment 1 work time | Assignment 1 work time |
| 4 | 13-08-18 | Assignment 1 work time | Assignment 1: presentation |
| 5 | 20-08-18 | Advanced SQL 1 | Dale’s day |
| 6 | 27-08-18 | Advanced SQL 2 | Performance: Physical design |
| 7 | 03-09-18 | Performance: Query Optimisation | Performance: Tuning |
| 8 | 10-09-18 | Application Dev 1: Interface design | Application Dev 2: Front end tools |
| 9 | 17-09-18 | Application Dev 3: Project spec | Transactions and Locking |
| 10 | 24-09-18 | Data Warehousing and Mining | GIS and spatiotemporal DBs |
| Midterm Break | | | |
| 11 | 15-10-18 | Non-relational models 1 | Non-relational models 2 |
| 12 | 22-10-18 | DBA1: Duties | DBA2: Installation |
| 13 | 29-10-18 | DBA3: Users and privileges | DBA4: SQL for DBAs |
| 14 | 05-11-18 | DBA5: Backup and recovery | DBA6: Database Security |
| 15 | 12-11-18 | High Availability and Reliability | Assignment 2 demos |
| 16 | 19-11-18 | Exam revision session | Final exam |

**Assessment**

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| Assessment | **Weight** |  |
| Exam | 25% | 22/23 Nov (last in-class session). |
| Project Work | 65% | Modelling: Aug 20, 5pm. Application: Nov 16, 5pm. |
| DBA Assessment | 10% | In-class exercises weeks 12 through 14 |

* Detailed assignment requirements, including instructions for submission, will be provided for each assessment.

**Course Requirements and Expectations**

# Learning Hours

# This course requires 150 hours of learning. This time includes 64 hours of timetabled class time, 32 hours of tutorial assistant supported tutorials, and 54 hours of self-directed reading, preparation and completion of assignment work.

# Criteria for Passing

# To pass this paper, you must achieve an overall average of 50. There must be a genuine attempt at all assessments. There are no resits.

# Attendance

* Students are expected to attend all classes, both lectures and labs.
* If you miss a class you will need to get notes from another student.
* If you cannot attend for a few days for any reason, please contact your lecturer.
* You must turn up ready for assessments on the due date and at the correct time. No extra time will be scheduled. If you do not turn up, you have failed the assessment.

## Communication

Your student email is an official communication channel. It is your responsibility to regularly check your student email and Moodle for important course related material, including changes to class scheduling or assessment details. Not checking will not be accepted as an excuse.

You can manage your email at the Student Hub and download the instructions for forwarding your email at http://www.op.ac.nz/students/student-hub/

## Snow Days/Polytechnic Closure

In the event that the Polytechnic is closed or has a delayed opening because of snow or bad weather, you should not attempt to attend class if it is unsafe to do so. It is possible that your instructor will not be able to attend either, so classes will not physically be meeting. However, this does not become a holiday. Rather, material will be available on either Moodle of the I drive covering the material for classes affected by the closure. You are responsible for any material presented in this manner. Information about closure will be posted on the BIT and Otago Polytechnic Facebook pages <https://www.facebook.com/OtagoPoly>.

## Group work and originality

Students in the Bachelor of Information Technology degree are expected to hand in original work. Students are encouraged to discuss assignments with their fellow students, however, all assignments are to be completed as individual works unless group-work is ***explicitly*** required (i.e. if it doesn’t say it is group-work then it is not group-work – even if a group consultation was involved). Failure to submit your own original work will be treated as plagiarism.

## Referencing

Appropriate referencing is required for all work. Referencing standards will be specified by your lecturer.

## Plagiarism

Plagiarism is submitting someone else’s work as your own. Plagiarism offences are taken seriously and an assessment that has been plagiarised may be awarded a zero mark. A definition of plagiarism is in the Student Handbook, available online or at the School office.

## Submission requirements

All assignments are to be submitted by the time, date, and method given when the assignment is issued. Failure to meet all requirements may result in a penalty of up to 10% per day (including weekends).

## Extensions

Extensions are only available for unusual circumstances. These must be applied for, and approved, prior to the submission deadline.

## Impairment

In case of sickness contact your lecturer or year co-ordinator as soon as possible, preferably before the test or assignment is due. The policy regarding the granting of a mark that considers impaired performance requires a medical certificate and a medical practitioner’s signature on a form. You may should refer to the guide on impaired performance on the student handbook.

## Appeals

If you are concerned about any aspect of your assessment, please approach the lecturer in the first instance. We support an open door policy and aim to resolve issues promptly. Further support is available from Year Co-ordinators, Programme Manager and Head of School. Otago Polytechnic has a formal process for academic appeals if necessary.

# Other Documents

Regulatory documents relating this course can be found on the Polytechnic website.