

School of Information Technology

Bachelor of Information Technology

Course Directive

IN605001 Databases 2 Semester One, 2020

# Aim

To give an understanding of the fundamentals of database management systems with an emphasis on relational systems.

# Course Information

|  |  |  |  |
| --- | --- | --- | --- |
| *SMS Code* | *IN605001* | *Directed Learning hours* | *60* |
| *Level* | *6* | *Workplace or Practical Learning hours* | *0* |
| *Credits* | *15* | *Self Directed Learning hours* | *90* |
| *Prerequisites* | *IN505001*  *IN511001* | *Total Learning Hours* | *150* |

This table is taken directly from the program document for the degree. Please take note of the following:

* The pre-requisites are important. The **IN505001** and **IN511001** if you have not completed those courses then you should not be enrolled in this.
* You are supposed to be working for **one and a half hours outside of Lab for every hour within a Lab**. That is throughout the course – not just in the week before an assignment or exam. The exam will assume you have studied throughout the course so please don’t leave all your reading and study until the last week.

# Lecturers

|  |  |
| --- | --- |
| Name | Krissi Wood |
| Location | D308 |
| Phone | 03 4796141 |
| email | Krissi.Wood@op.ac.nz |

**Course Dates**

|  |  |  |  |
| --- | --- | --- | --- |
| Term 1 (8 weeks) | 17 Feb – 9 Apr |  |  |
| Mid semester break | 10 Apr – 27 Apr |  |  |
| Term 2 (8 weeks) | 28 Apr – 19 Jun |  |  |
|  |  |  |  |

**Learning Outcomes**

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

1. Apply the normalization rules to the creation of a relational database.
2. Construct an appropriate data and database (ERD) model for a specified problem and build the corresponding database
3. Construct and apply syntactically correct database queries using an appropriate query language
4. Implement basic data checking and validation in SQL to ensure data integrity

**Indicative Content**

1. Role of relational databases and relational database management systems
2. Formal database theory – relational algebra, functional dependencies and normalisation.
3. Architecture of relational database management systems
4. Query construction and optimisation
5. Data modelling
6. Design and implementation of relational databases
7. Principles of database administration and database security

**Resources**

* **Required:**

Churcher, Clare (2007) or (2012) Beginning Database Design Apress

MariaDB / MySQL Development Documentation

* **Files**

I:\COURSES\ITP\BITY1\IN605 DB2

# Highly Recommended:

These are not necessary but are good books for reference on SQL.

* Kreibich, J. A. (2010) Using SQLite Oreilly Media

**Lab Times**

|  |  |  |
| --- | --- | --- |
|  | Day / Time / Room | Day / Time / Room |
| Stream A | Tuesday  1:00pm – 2:45pm  D207 | Thursday  1:00pm – 2:45pm  D207 |
| Stream B | Wednesday  8:00am – 9:45am  D207 | Friday  10:00am – 11:45am  D207 |

# Assessment

|  |  |  |  |
| --- | --- | --- | --- |
| ***Item*** | ***Due Date*** | ***Weighting*** | ***Learning Outcomes*** |
| SQL Worksheet | 6th April (11:59 pm) | 10 | 3 |
| XML Worksheet | 29th May (11:59 pm) | 10 | 3,4 |
| Design | 1st May (11:59pm) | 20 | 1, 2 |
| Build | 5th June (11:59 pm) | 20 | 1,2,3,4 |
| Exam | 18th /19th June (Class) | 40 | 1,3,4 |
|  |  | 100 |  |

## Worksheet Tasks

These are submissions of small tasks which will guide your learning. Think of these as assessed “homework”. These are vital preparation for the final exam.

## Design Assignment

You will create a data model for a given scenario. Paired assignment.

## Build Assignment

You will be given a data model and a set of requirements to build a database using DDL, DML, and DCL commands from SQL. Your submission will be a script which can be run using the SOURCE command within MySQL.

## Exam

This is a two hour written exam which will address all elements from the course. This exam will include material from the required textbook and material covered in class / assignments.

# Course Content

## Planned Schedule

|  |  |  |
| --- | --- | --- |
|  | **Lab 1** | **Lab 2** |
| 1. | Introduction. Properties of a DB. Types of databases | Play with SQL |
| 2. | Data Modelling Introduction (Ch1-2) | More on Use Cases (ch3) |
| 3. | Developing the data model (ch4-5) | Generalisation & Specialisation (ch6) *Design assignment given* |
| 4. | Normalisation (ch 8) | SQL Intro – joins (ch10) *SQL worksheet given* |
| 5. | SubSelects and Inner Joins | Outer Joins |
| 6. | NULLs and Modifications | SQL Worksheet day |
| 7. | Physical Design | Stored Procedures & Triggers Scripting MySQL |
| 8. | Constraints, views and indexes  *SQL Due* | *Good Friday* |
|  | Mid Semester Break |  |
| 9. | Design Assignment work day | Program Control  *Design Due* |
| 10. | Concurrency | Controlling Transactions *Hand out Build* |
| 11. | Validation *Hand out worksheet* | Validation worksheet day |
| 12. | Security / Permissions | Security / Permissions - Authorisation |
| 13. | Build Assignment  *(Very difficult to do if starting now!)* | Build Assignment *Validation Due* |
| 14. | Date / Time | NoSQL *Build Due* |
| 15. | Assignment Marking | Study & Revision |
| 16. | Assignment Marking | Exam |

# Criteria for Passing

To pass this course you must gain a weighted mark of 50% taken over all assessments.

There is a policy of no re-sits or resubmissions. There must be a genuine attempt at all assessments.

**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.

# 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, bad weather or zombies, 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 practitioners 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 the BIT Team Leader (Joy Gasson) and Head of College (Richard Nyhof). 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.