



Module Specification

Key Information			
Module title	Databases, Networks and the Web		
Level	5	Credit value	15
Member Institution	Goldsmiths	Notional study hours and duration of course	150
Module lead author/ Subject matter expert			
Module co-author			

Rationale for the module
<p>Many computer systems involve networks of computers interacting with each other to deliver coherent, integrated services such as banking, shopping and social media. A vital element of these services is how they represent, store and access data. This module provides practical and theoretical skills which will enable you to reason about networked systems and use them to create coherent services such as data-driven web applications. These skills build on the computing and web fundamentals taught earlier in the programme, and will allow you to work on more advanced data and web systems later in the programme.</p>

Aims of the module
<p>In this module, you will learn theory and practical skills focused on the modern web, internet and client-server applications. You will learn about relational database systems, mainly from a development perspective, emphasising issues related to data modelling and database implementation in SQL. You will learn how to model data in a database, retrieve data from the database and provide access to data through dynamic websites. In particular, you will learn about the Relational Model, Query processing, and socket architectures to enable communication.</p>

Topics covered in this module:

The topics listed here are an approximation of what will be covered. The topics presented may be slightly revised to ensure currency and relevance. Students will be advised of any changes in advance of their study.

1. Three-tier web application
2. Building simple web servers
3. Generating web pages from data using templates
4. Handling forms to input data
5. Representing data in databases, relational databases
6. Basic database operations, providing access to databases from middleware
7. Building a dynamic web application
8. Database schema, ERD
9. Querying a database (advanced)
10. Networking concepts

Approximately 10-12 hours of study will be required per topic. The remaining study time is intended for coursework and examination preparation.

Learning outcomes for the module

Students who successfully complete this module will be able to:

1. Explain the context behind the relational model and describe the process of schema development
2. Devise, explain and implement an appropriate representation of data in an SQL RDBMS
3. Explain and apply the basic concepts of computer networking, including, what is a network, what is it used for and how to characterise it
4. Explain the importance of dynamic web-based applications and their interaction with database servers
5. Perform queries on databases using multiple related tables
6. Write web-based applications that run in a web-browser and interact with a database server

Assessment strategy, assessment methods

Summative and Formative Assessments

The module will contain a range of summative and formative assessments. Summative assessments are assessments which contribute directly towards your final grade. Formative assessments do not count directly towards your final grade. Instead, they provide you with opportunities for low stakes practice, and will often provide some sort of feedback about your progress. For example, a practice quiz might provide you with feedback about why a particular answer was wrong.

Assessment Activities

The table below lists the assessment activity types you might encounter taking the module. It also states if that type of assessment can be automatically graded. For example, multiple choice quizzes can be automatically graded, and so can some programming assignments. It also states if that type of assessment will be found in the summative coursework and the summative examination. More details about the summative assessments are provided below.

Assessment activity type	Can it be automatically graded with feedback in some cases?	Coursework	Examination
Quiz	X	X	X
Writing task		X	X
Development task	X	X	
Peer review task		X	

Pass Mark

In order to pass this module, you must achieve at least 35% in each element of summative assessment and an overall weighted average of 40%, subject to the application of rules for compensation. Please refer to the programme regulations for more information.

Summative Assessment Elements

As this is a module that has a significant amount of theory it is assessed as a theory-based module. This means that the summative assessment is composed of two elements, whose weightings are listed in the table below.

Summative Assessment Component	Percentage of final credit	Deadline
Coursework	50%	Mid session
Examination	50%	End of session

The coursework comprises a variety of practical exercises and quizzes which in total will take up to 25 hours of study time to complete. The examination will be two hours long, and consist of written answer and multiple choice questions.

Learning resources

Specific essential readings for each week from the following list are included in the Readings page:

Ceri, S. et al. *Designing data-intensive web applications*. (San Francisco, CA: Morgan Kauffman Publishers, 2003). [ISBN 9780080503936].

Mendez, M. *The missing link: an introduction to web development and programming*. (Geneseo, NY: Open SUNY textbooks, 2014). [ISBN 9781502447968].

Krause, J. *Programming web applications with Node, Express and Pug*. (New York, NY: Apress Media LLC, 2017). [ISBN 9781484225110].

Yaapa, H. *Express web application development: learn how to develop web applications with the Express framework from scratch*. (Birmingham: Packt Publishing Ltd., 2013). [ISBN 9781849696555]

Hoffer, J., R. Venkataraman and H. Topi *Modern database management*. (Harlow: Pearson Education Ltd., 2016). 12th Global edition. [ISBN 9781292101866].

Elmasri, R. and S. Navathe *Fundamentals of database systems*. (Harlow: Pearson Education Ltd., 2017). 7th Global edition. [ISBN 9781292097619].

Some key online references are:

- W3 Schools Online Tutorials, <https://www.w3schools.com/nodejs/> and <https://www.w3schools.com/sql/>
- Node.js <https://nodejs.org/en/docs/guides/>
- Express <https://expressjs.com>