BUSINESS SCHOOL
Te Kura Pakihi

DEPARTMENT OF INFORMATION SCIENCE

Enterprise Information Systems Infrastructure
INFO303

COURSE OUTLINE

Semester 1
2023

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1 Paper Description and Aims

Large, modern organisations have complex information and communication needs. These enterprises need the support of an appropriate software and information infrastructure in order to meet their business goals. INFO303 explores how enterprises integrate and use information from a diverse range of sources, with a particular focus on integration middleware, big data, and analytics. INFO303 equips graduates with the knowledge to manage and use appropriate tools in a dynamic and evolving information environment.

Topics include enterprise computing technologies (middleware,technology stacks and deployment technologies), data technologies for real-time queries and exploratory analytics, integration of computing and data services, and the role of an enterprise architect in planning and managing an organisation's information systems infrastructure

Students will gain practical experience in developing distributed applications using Java, web services, the ActiveMQ message broker and the Apache Camel service integration framework, and in the design of data warehouses.

Points: 18
Prerequisites: INFO202 or COSC241

2 Learning Outcomes

Students who successfully complete the paper should be able to:

- Understand the concept of middleware and the architecture, design, and creation of web services.
- Appreciate issues relating to cloud computing and virtualisation, and be familiar with associated technologies.
- Reflect on the suitability of infrastructure options for a given context (an organisational setting), including consideration of security implications.
- Apply a middleware infrastructure (in an organisational context).
- Understand technologies used to manage and process voluminous and semi-structured data sources (e.g. NoSQL, Hadoop, Apache Spark, Star Schemas).
- Understand data warehousing concepts.
- Use tools to implement business processes.

3 Teaching Staff

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4 Times and Rooms

There are **two lectures** each week. These will be held in person (with recordings available afterwards via Otago Capture), unless COVID-19 restrictions require us to deliver them online. The locations will be available on Blackboard and in an updated version of this document once the university timetable for Semester 1 has been finalised.

Wednesday	**12:00 noon–12:50 pm**
Friday	**11:00 am–11:50 am**

There will be no lecture on Friday 7 April (Good Friday) as this is a public holiday.

Students are also streamed for one **two-hour laboratory session** each week. For more information regarding labs see Section 7 (Laboratories).

5 Expectations and Workload

As this is an 18 point paper, it is expected that on average students will work for eight hours per week on the paper in addition to the scheduled contact hours. This additional time should be spent reviewing lecture material, reading the recommending readings, practising the concepts learned in lectures and labs, and working on assignments.

6 Course Materials and Communication

There is *no* textbook for INFO303.

Course materials (lecture notes, assignment details, and any other resources that we think you will find useful) will be made available via Blackboard.

Lectures will be recorded and made available for viewing via Otago Capture (see the link in Blackboard).

Course-related announcements will be made regularly at lectures and on Blackboard. You should regularly check Blackboard and your student email account for notices. We reserve the right to change assignment deadlines, tutorial dates, and test dates if necessary (but will give a reasonable amount of warning).

Individual students' assignment and test results and feedback (where applicable) will be made available (privately) via Blackboard. Please check your results regularly and notify Mark George of any discrepancies.

7 Laboratories

Each student will be streamed for a two-hour laboratory session to be held each week in lab OBS 3.26/3.27. You can see your streaming information on eVision. For any period when COVID-related social distancing is required on campus, we will hold labs online via Zoom.

As Tuesday 25 April is a public holiday (ANZAC Day), if any labs are schedule for Tuesdays, they will be rescheduled to another day for that week only. If you are in an affected lab stream, your timetable will show this change for week 17 of the year.

There is a "terms requirement" regarding lab attendance—see Section 8.1.

In order to preserve a reasonable tutor-to-student ratio, students should only come to their streamed lab. Students who are not in the correct stream may be asked to leave.

Material covered in labs may go beyond that covered in lectures and is examinable.

If you want to use Linux outside lab sessions, note that computers in the North CAL lab (opposite the Science Library) are now set up identically to OBS 3.26/3.27, with both Windows and Linux available.

In periods of peak demand the use of lab machines may be restricted to course-related work only (e-mail and Internet browsing is not considered to be course-related work).

You can also run the student desktop on your own computer, tablet or smartphone by visiting `http://www.otago.ac.nz/studentdesktop` after installing the Citrix Receiver software. For more information, see `https://blogs.otago.ac.nz/studentit/student-desktop/student-desktop-own-device`.

8 Assessment

8.1 Terms Requirement

In order to "gain terms", i.e. to be allowed to sit the final exam, students must participate in at least 7 of the 11 labs that take place in weeks 2 to 12 of the paper. For administrative reasons, the labs in weeks 1 and 13 are excluded from this calculation. Please ensure that your lab participation is recorded during the lab sessions.

8.2 Data Warehouse Design Assignment

There will be an assignment on designing an appropriate structure for a data warehouse using dimensional modelling, and partially implementing this in SQL.

This assignment is worth 10%. See see the course schedule for the due dates.

8.3 Exam-Style Questions

During five selected weeks of the semester, a short exam-style question (ESQ) will be released, with student answers (worth 2% each) due at the end of the following week. The weeks in which ESQ answers are due are shown on the course schedule.

Answers will only be marked if they are written in complete coherent sentences **in the student's own words** (i.e. not copied, lightly paraphrased from lecture notes or other sources, or generated automatically by an artificial intelligence tool). Also, see Section 8.7 (Academic Integrity).

8.4 Semester Project

There will be a semester-long project that involves designing and implementing an integration of REST web services using the Java programming language, the Java Messaging Service (JMS), and the Apache Camel service integration framework. This is an individual project—each student is expected to create their own solution to the project requirements, and is worth 30% of your final mark. Submission will be in two parts—see the course schedule for due dates.

You will be given instructions on how to build and integrate the various components of the assignment project during lab sessions. You are advised to do your project work in labs as well as outside those times in order to complete each project component. **You may consult other students as well as staff during the implementation of your assignment project but may not copy other students' code. You should always include a comment identifying the source of any code you hand in that you did not write, e.g. if found in a book, on the Internet, or if a tutor or another student helped you. You may not submit code generated automatically by an AI system.**

We have a minimum expectation for the quality of submitted assignments. Projects that do not compile will **not** be marked. We will require a minimum amount of functionality for submitted projects—projects that don't have the minimum functionality will **not** be marked. The minimum functionality requirements will be specified on the project handouts.

It is also expected that throughout the project you will use the Information Science department's GitBucket code repository to save the current state of your project at regular intervals (every time you make a successful change to your code). This will help you develop the habit of following this good software engineering practice, and will also give us confidence that your work is your own: the incremental progress of your software development for each submission must be visible in your GitBucket history. **We will not accept a project submission that does not have a record of incremental updates, and if you have any problems with the repository at any time, you should inform us immediately—we will operate a "no surprises" policy**, meaning that we need to know about problems when they occur, not at the time of submission.

Your project will be submitted by "tagging" a version of your code in the master branch of your repository—we will not mark code in any other branches you may have created.

8.5 Extensions and Special Consideration

In cases of sickness or other special circumstances, we may offer individual students extensions to assignment deadlines or alternative forms of assessment to replace tests that have been missed. To be eligible for this, an affected student should inform Mark George as soon as possible and before the deadline has passed.

Extensions to assignments will be given at a penalty of 1.5 marks per day, unless there are exceptional circumstances. Note: Asking for an extension because you were sick for the last few days before the deadline is not considered to be an exceptional circumstance. You will have several weeks to work on each assignment deliverable. We recommend that you plan ahead and don't leave your assignment work until the last minute.

If there is any way in which we can help students with disabilities please let us know. We are happy to offer whatever assistance we can, but need to know in advance of any potential problems that might arise.

8.6 Grading System

The grading scheme used at Otago is:

A+	90–100	**C+**	60–64
A	85–89	**C**	55–59
A-	80–84	**C-**	50–54
B+	75–79	**D**	40–49
B	70–74	**E**	<40
B-	65–69		

A final grade of D or E means that you have failed the paper. You will also fail the paper without the chance to sit the final exam if you fail terms (see Section 8.1).

8.7 Academic Integrity

Academic integrity means being honest in your studying and assessments. It is the basis for ethical decision-making and behaviour in an academic context. Academic integrity is informed by the values of honesty, trust, responsibility, fairness, respect and courage. Students are expected to be aware of, and act in accordance with, the University's Academic Integrity Policy.

Academic Misconduct, such as plagiarism or cheating, is a breach of Academic Integrity and is taken very seriously by the University. Types of misconduct include plagiarism, copying, unauthorised collaboration, taking unauthorised material into a test or exam, impersonation, and assisting someone else's misconduct. A more extensive list of the types of academic misconduct and associated processes and penalties is available in the University's Student Academic Misconduct Procedures.

It is your responsibility to be aware of and use acceptable academic practices when completing your assessments. To access the information in the Academic Integrity Policy and learn more, please visit the University's Academic Integrity website (see the third URL below) or ask at the Student Learning Centre or Library. If you have any questions, ask the teaching staff.

Further information about the Academic Integrity Policy, the Student Academic Misconduct Procedures and the Academic Integrity can be found through the links below. The Academic Integrity website in particular has a number of useful links and suggestions as to where students can get help with referencing issues.

- `http://www.otago.ac.nz/administration/policies/otago116838.html`
- `http://www.otago.ac.nz/administration/policies/otago116850.html`
- `http://www.otago.ac.nz/study/academicintegrity`

For INFO303, we expect that all work submitted by students is their own, except where acknowledged explicitly in the submitted code or written work. Code taken from lecture notes does not need to be acknowledged, but code from (or based on) any publicly available source may be used if the extent and source of this code is acknowledged in a comment, and it does not form a significant portion of the submission. If in doubt, ask the teaching staff. **In written work, it is not acceptable to reproduce or lightly paraphrase text from lecture notes, or other sources, except for occasional short passages in quotation marks with a formal citation to the original source**. However, quotations should be used to illustrate the views of others, not to avoid the effort of expressing ideas in your own words. **When assessing written assessment we are looking for evidence of students' knowledge and ability to express it**. This is not evident in submissions that consist largely of a collection of quoted and paraphrased text written by others, and work of this nature is likely to earn low marks.

Note that the University reserves the right to use plagiarism detection tools, and **in INFO303 we will use appropriate tools to check submitted written work and code for evidence of plagiarism**.

8.8 Final Examination

The final examination will be three hours long and will be conducted by the Registry on campus during the final examination period, or (if social distancing restrictions require) delivered via Blackboard.

The exam will cover material from the entire semester. The date, time, and location of this examination will be announced during the semester.

8.9 Assessment Summary

The final mark for each student will be determined as follows:

Exam-style questions	10%
Data warehouse design assignment	10%
Project phase 1	15%
Project phase 2	15%
Final examination	50%

9 Quality Assurance

At the Otago Business School we monitor the quality of student learning and your learning experience. Your assessed work may be used for assurance of learning processes, such as evaluating the level of achievement of learning outcomes, with the aim of improving the quality of our programmes. All material used for quality assurance purposes will be treated as confidential and the outcome will not affect your grades.

10 Course Schedule

A schedule of lab and lecture topics and assessment deadlines is available on the Course Information page on Blackboard. Note that the schedule is subject to change and may be updated during the course of the paper.

11 Disclaimer

While every effort is made to ensure that the information contained in this document is accurate, it is subject to change. Changes will be notified in class and via Blackboard. Students are encouraged to check Blackboard and their student email accounts regularly. It is each student's responsibility to keep themselves informed about the paper.