MONASH University

**FIT4026
Enterprise programming**

Unit guide

Semester 1, 2009

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FIT4026 Enterprise programming - Semester 1, 2009

Unit leader :

Gour Karmakar

Lecturer(s) :

Gippsland

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Tutors(s) :

Gippsland

- Gour Karmakar

Introduction

Welcome to FIT4026 Enterprise programming. This is an elective unit of the Masters of Applied Information technology (MAIT) at Gippsland. The unit has been designed to provide you with an understanding of distributed database systems and architectures, implementation issues, enterprise application server capabilities and coding, and enterprise application software development tools (both GUI and command-line) . It represents a practical preparation for those students wishing to commence their careers with an emphasis on programming.

Unit synopsis

This unit covers:

- Distributed database systems: clients, servers, application servers, database servers, clusters of servers.
- Distributed database architectures: single-tier, two-tier, multi-tier.
- Implementation issues: performance, security, transactions.
- Enterprise application server capabilities: hot deployment, clean shutdown, clustering, farming, load balancing, automatic fail-over.
- Enterprise application coding: DBMS access, distributed components, messaging services, authentication, authorization, encryption, transactions, fat clients, thin (web) clients.
- Exterprise application software development tools (both GUI and command-line).
- Enterprise application server similarities and differences: investigation of at least two different application servers.

Access to the University's computer systems through an Internet service provider is compulsory for off-campus students.

Learning outcomes

Knowledge and Understanding

- Understand the various ways in which a database application may be scaled to the enterprise level, including:

  ♦ applications being split between clients and servers;
  ♦ servers being split between application servers and database servers;
  ♦ application servers being split into clusters of application servers.
- Be able to evaluate the advantages and disadvantages of single-tier, two-tier and multi-tier architectures.
- Be aware of some of the pitfalls (and ways to avoid or minimise them) of distributed applications, including:

  ♦ performance problems due to network latency and bandwidth;
  ♦ security problems when transmitting data over an untrusted network;
  ♦ transactional problems when transactions must be distributed over multiple servers.
- Be able to evaluate when it is appropriate to use enterprise programming techniques, and when simpler solutions will suffice.
- Be able to configure an enterprise application and application server to take advantage of advanced capabilities such as:

  ♦ hot deployment;
  ♦ clean shutdown;
  ♦ clustering;
  ♦ farming;
  ♦ load balancing;
  ♦ automatic fail-over.
- Be able to design and implement an enterprise application that makes appropriate use of the following:

  ♦ DBMSs;
  ♦ distributed components;
  ♦ messaging services;
  ♦ security (authentication, authorization and encryption);
  ♦ transactions;
  ♦ fat clients;
  ♦ thin (web) clients.
- Be familiar with a selection of software tools (both GUI and command-line) to speed enterprise application development.
- Be able to deploy applications in at least two different enterprise application servers.

Attitudes, Values and Beliefs

- Accept the importance of client and server operating system platforms other than Windows, and therefore the need for technologies that support multiple platforms.
- Appreciate the value that an application server adds to an application with remarkably little additional coding effort.
- Develop an interest in the various compatible yet competing enterprise application servers, and an appreciation of their relative strengths and weaknesses.

Workload

The workload commitment for this unit is 12 hours per week for 13 weeks.

On campus students: two hours of lectures, two hours of computer laboratory work and eight hours of private study, programming and newsgroup discussion.

OCL students: twelve hours of private study and communicating with the lecturer and fellow students through newsgroups and (where appropriate) e-mail.

Unit relationships

Prerequisites

Before attempting this unit you must have satisfactorily completed

GCO9808 or FIT9013 or equivalent

You should have knowledge of and exposure to the Java programming language and concepts of object-oriented programming.

Relationships

FIT4026 is an elective unit of the Masters of Applied Information Technology (MAIT) at Gippsland.

You may not study this unit and CSE3450, GCO3823/FIT3011, Translation set GCO4823 in your degree.

Continuous improvement

Monash is committed to 'Excellence in education' (Monash Directions 2025 - http://www.monash.edu.au/about/monash-directions/directions.html) and strives for the highest possible quality in teaching and learning.

To monitor how successful we are in providing quality teaching and learning Monash regularly seeks feedback from students, employers and staff. One of the key formal ways students have to provide feedback is through Unit Evaluation Surveys. The University's Unit Evaluation policy (http://www.policy.monash.edu/policy-bank/academic/education/quality/unit-evaluation-policy.html) requires that every unit offered is evaluated each year. Students are strongly encouraged to complete the surveys as they are an important avenue for students to "have their say". The feedback is anonymous and provides the Faculty with evidence of aspects that students are satisfied and areas for improvement.

Faculties have the option of administering the Unit Evaluation survey online through the my.monash portal or in class. Lecturers will inform students of the method being used for this unit towards the end of the semester.

Student Evaluations

If you wish to view how previous students rated this unit, please go to http://www.adm.monash.edu.au/cheq/evaluations/unit-evaluations/

Unit staff - contact details

Unit leader

Dr Gour Karmakar
Lecturer
Phone +61 3 990 26252

Lecturer(s) :

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Contact hours : Thursday (12:00-13:00 PM). For other time please make an appointment via email.

Tutor(s) :

Dr Gour Karmakar
Lecturer
Phone +61 3 990 26252

Additional communication information

E-mail: Gour.Karmakar@infotech.monash.edu.au

Teaching and learning method

On campus students attend weekly lecture and computer laboratory classes, as well as having access to the same resources as OCL students.

OCL students work through week-by-week study materials provided in print form and on the unit web site. These materials define weekly learning objectives, then guide into reading and exercises to achieve these objectives.

Students and staff in the unit communicate through newsgroups that permit discussion of the week-by-week theoretical and practical activities, as well as assignment and other work.

Communication, participation and feedback

Monash aims to provide a learning environment in which students receive a range of ongoing feedback throughout their studies. You will receive feedback on your work and progress in this unit. This may take the form of group feedback, individual feedback, peer feedback, self-comparison, verbal and written feedback, discussions (on line and in class) as well as more formal feedback related to assignment marks and grades. You are encouraged to draw on a variety of feedback to enhance your learning.

It is essential that you take action immediately if you realise that you have a problem that is affecting your study. Semesters are short, so we can help you best if you let us know as soon as problems arise. Regardless of whether the problem is related directly to your progress in the unit, if it is likely to interfere with your progress you should discuss it with your lecturer or a Community Service counsellor as soon as possible.

Unit Schedule

Week	Topic	Study guide	References/Readings	Key dates
1	Introduction	1	Textbook chapter 1	
2	A First J2EE Application	2	Textbook chapters 2 and 3	
3	Software development tools	3	Textbook chapter 4	
4	Container-managed persistence	4	Textbook chapter 6	
5	More on CMP entity beans	5	Textbook Appendix D & chapter 8	
6	Web components	6	Reader extracts	
Mid semester break				
7	Container-managed relationships	7	Textbook chapter 15	
8	Security	8	Textbook chapter 13	A1 due April 22, 2009
9	Transactions	9	Textbook chapter 12	
10	Message-driven beans and MOM	10	Textbook chapter 9	
11	Advanced topics	11	Textbook chapters 19 and 21	
12	Sample exam			A2 due May 27, 2009

Unit Resources

Prescribed text(s) and readings

Roman, Sriganesh and Brose, *Mastering Enterprise JavaBeans*, Third Edition, Wiley, 2004, ISBN 0764576828

Text book is available from the Monash University Book Shops. Availability from other suppliers cannot be assured. The Bookshop orders texts in specifically for this unit. You are advised to purchase your text book early.

Recommended text(s) and readings

Monson-Haefel, Burke and Labourey, *Enterprise JavaBeans*, Fourth Edition, O'Reilly, 2004, ISBN 059600530X.

Sierra and Bates, *Head First EJB (Brain-Friendly Study Guides; Enterprise JavaBeans)*, O'Reilly, 2003, ISBN 0596005717.

Boone, *Applied Enterprise JavaBeans Technology*, Prentice Hall, 2002, ISBN 0130449156.

Wutka, *Special Edition Using Java 2 Enterprise Edition*, Que, 2001, ISBN 0789725037.

Marinescu, *EJB Design Patterns*, Wiley, 2002, ISBN 0471208310.

Alur, Malks and Crupi, *Core J2EE Patterns: Best Practices and Design Strategies*, Second Edition, Prentice Hall, 2003, ISBN 0131422464.

Required software and/or hardware

You will need to use either Fedora Core (Red Hat) 4 Linux or VMware/JBoss. Both software packages are provided on a DVD. It is recommended to use VMware/JBoss. If you use VMware/JBoss you do not need to download JBoss 4 and related software since they have already been uploaded in the virtual machine. The steps for installation and testing of VMware/JBoss are provided in your unit book.

JBoss 4 and related software (Java, Ant, XDoclet etc).

Software may be:

- JBoss AS 4.0 or later (http://www.jboss.org/products/jbossas)
- JBoss-IDE 1.4.0 or later (http://www.jboss.org/products/jbosside)
- J2SE 1.5.0 or later (http://java.sun.com/j2se/index.jsp)

Equipment and consumables required or provided

Students studying off-campus are required to have the minimum system configuration specified by the faculty as a condition of accepting admission, and regular Internet access. On-campus students, and those studying at supported study locations may use the facilities available in the computing labs. Information about computer use for students is available from the ITS Student Resource Guide in the Monash University Handbook. You will need to allocate up to 10 hours per week for use of a computer, including time for newsgroups/discussion groups.

For the installation of VWware/JBoss, you need a PC with Windows 2000 or later having at least 512MB RAM .

Study resources

Study resources we will provide for your study are:

A printed Unit Book containing 12 study guides.

A printed Reader.

This Unit Information outlining the administrative information for the unit.

A CD-ROM sent at the start of the year, with software required for all units (this includes all the software required to complete this unit).

A DVD containing a Linux distribution (use of Linux is optional).

 A DVD containing a VMware/JBoss (use of VMware/JBoss is optional but recommended).

A unit web page where weekly lecture notes outlining the learning objectives, discussion of the content, required readings and exercises, weekly tutorial requirements, assignment specifications, sample solutions and supplementary material will be posted.

Newsgroups/discussion groups that can be linked to from the Unit Homepage.

Library access

The Monash University Library site contains details about borrowing rights and catalogue searching. To learn more about the library and the various resources available, please go to http://www.lib.monash.edu.au.

The Educational Library and Media Resources (LMR) is also a very resourceful place to visit at http://www.education.monash.edu.au/library/

Monash University Studies Online (MUSO)

All unit and lecture materials are available through MUSO (Monash University Studies Online). Blackboard is the primary application used to deliver your unit resources. Some units will be piloted in Moodle. If your unit is piloted in Moodle, you will see a link from your Blackboard unit to Moodle (http://moodle.monash.edu.au) and can bookmark this link to access directly. In Moodle, from the Faculty of Information Technology category, click on the link for your unit.

You can access MUSO and Blackboard via the portal: http://my.monash.edu.au

Click on the Study and enrolment tab, then Blackboard under the MUSO learning systems.

In order for your Blackboard unit(s) to function correctly, your computer needs to be correctly configured.

For example:

- Blackboard supported browser
- Supported Java runtime environment

For more information, please visit: http://www.monash.edu.au/muso/support/students/downloadables-student.html

You can contact the MUSO Support by phone : (+61 3) 9903 1268

For further contact information including operational hours, please visit: http://www.monash.edu.au/muso/support/students/contact.html

Further information can be obtained from the MUSO support site: http://www.monash.edu.au/muso/support/index.html

Assessment

Unit assessment policy

To pass this unit, a student must attempt the assignments and the examination and must obtain :

- 40% or more in the unit's examination
  and
- 40% or more in the unit's **total non-examination** assessment
  and
- an overall unit mark of 50% or more

If a student does not achieve 40% or more in the unit examination or the unit non-examination total assessment, and the total mark for the unit is greater than 44% then a mark of 44-N will be recorded for the unit.

Assignment tasks

- ## Assignment Task

  Title : Assignment 1

  Description :

  Development of a command-line based enterprise application for a client server architecture
  Weighting : 16%

  Criteria for assessment :

  Correctness, Robustness, User Interface, Efficiency, Simplicity, Modularity and Layout

  All of these are detailed in assignment preparation guide of the unit book.

  Due date : 22 April 2009

- ## Assignment Task

  Title : Assignment 2

  Description :

  Development of a web-based enterprise application for a client server architecture
  Weighting : 24%

  Criteria for assessment :

  Correctness, Robustness, User Interface, Efficiency, Simplicity, Modularity, Layout, Transactions, Authentication and Authorization, and Multi-user.

  Most of these are detailed in assignment preparation guide of the unit book.

  Due date : 27 May 2009

Examinations

- ## Examination 1

  Weighting : 60%

  Length : 3 hours

  Type (open/closed book) : Closed book

Assignment submission

Assignments will be submitted electronically via the *WebFace* assignment submission system (http://wfsubmit.gscit.monash.edu.au).

Assignment coversheets

Assignment coversheets are to be obtained from the *WebFace* assignment submission system (http://wfsubmit.gscit.monash.edu.au)

University and Faculty policy on assessment

Due dates and extensions

The due dates for the submission of assignments are given in the previous section. Please make every effort to submit work by the due dates. It is your responsibility to structure your study program around assignment deadlines, family, work and other commitments. Factors such as normal work pressures, vacations, etc. are seldom regarded as appropriate reasons for granting extensions. Students are advised to NOT assume that granting of an extension is a matter of course.

Requests for extensions must be made by email **at least two days** before the due date (unless the nature of the problem has made this impossible). You may be asked to forward original medical certificates in cases of illness, and may be asked to provide other forms of documentation where necessary.

Contact the Unit Adviser by email (Gour.Karmakar@infotech.monash.edu.au) to request extensions.

Late assignment

Assignments received after the due date will normally be subject to a penalty computed as:
    raw_mark * days_late / 7

Assignments received later than one week after the due date will not normally be accepted.

This policy has to be strict so that sample solutions can be published within a reasonable time after the due date.

Return dates

Students can expect assignments to be returned within two weeks of the submission date or after receipt, whichever is later.

Assessment for the unit as a whole is in accordance with the provisions of the Monash University Education Policy at http://www.policy.monash.edu/policy-bank/academic/education/assessment/

Plagiarism, cheating and collusion

Plagiarism and cheating are regarded as very serious offences. In cases where cheating has been confirmed, students have been severely penalised, from losing all marks for an assignment, to facing disciplinary action at the Faculty level. While we would wish that all our students adhere to sound ethical conduct and honesty, I will ask you to acquaint yourself with the University Plagiarism policy and procedure (http://www.policy.monash.edu/policy-bank/academic/education/conduct/plagiarism-procedures.html) which applies to students detected plagiarising.

In this University, cheating means seeking to obtain an unfair advantage in any examination or any other written or practical work be submitted or completed by a student for assessment. It includes the use, or attempted use, of any means to gain an unfair advantage for any assessable work in the unit, where the means is contrary to the instructions for such work.

When you submit an individual assessment item, such as a program, a report, an essay, assignment or other piece of work, under your name you are understood to be stating that this is your own work. If a submission is identical with, or similar to, someone else's work, an assumption of cheating may arise. If you are planning on working with another student, it is acceptable to undertake research together, and discuss problems, but it is not acceptable to jointly develop or share solutions unless this is specified by your lecturer.

Intentionally providing students with your solutions to assignments is classified as "assisting to cheat" and students who do this may be subject to disciplinary action. You should take reasonable care that your solution is not accidentally or deliberately obtained by other students. For example, do not leave copies of your work in progress on the hard drives of shared computers, and do not show your work to other students. If you believe this may have happened, please be sure to contact your lecturer as soon as possible.

Cheating also includes taking into an examination any material contrary to the regulations, including any bilingual dictionary, whether or not with the intention of using it to obtain an advantage.

Plagiarism involves the false representation of another person's ideas, or findings, as your own by either copying material or paraphrasing without citing sources. It is both professional and ethical to reference clearly the ideas and information that you have used from another writer. If the source is not identified, then you have plagiarised work of the other author. Plagiarism is a form of dishonesty that is insulting to the reader and grossly unfair to your student colleagues.

Register of counselling about plagiarism

The university requires faculties to keep a simple and confidential register to record counselling to students about plagiarism (e.g. warnings). The register is accessible to Associate Deans Teaching (or nominees) and, where requested, students concerned have access to their own details in the register. The register is to serve as a record of counselling about the nature of plagiarism, not as a record of allegations; and no provision of appeals in relation to the register is necessary or applicable.

Non-discriminatory language

The Faculty of Information Technology is committed to the use of non-discriminatory language in all forms of communication. Discriminatory language is that which refers in abusive terms to gender, race, age, sexual orientation, citizenship or nationality, ethnic or language background, physical or mental ability, or political or religious views, or which stereotypes groups in an adverse manner. This is not meant to preclude or inhibit legitimate academic debate on any issue; however, the language used in such debate should be non-discriminatory and sensitive to these matters. It is important to avoid the use of discriminatory language in your communications and written work. The most common form of discriminatory language in academic work tends to be in the area of gender inclusiveness. You are, therefore, requested to check for this and to ensure your work and communications are non-discriminatory in all respects.

Students with disabilities

Students with disabilities that may disadvantage them in assessment should seek advice from one of the following before completing assessment tasks and examinations:

- Faculty of Information Technology Student Service staff, and / or
- your Unit Coordinator, or
- Disabilities Liaison Unit

Deferred assessment and special consideration

Deferred assessment (not to be confused with an extension for submission of an assignment) may be granted in cases of extenuating personal circumstances such as serious personal illness or bereavement. Information and forms for Special Consideration and deferred assessment applications are available at http://www.monash.edu.au/exams/special-consideration.html. Contact the Faculty's Student Services staff at your campus for further information and advice.