King Fahd University of Petroleum and Minerals
Department of Information and Computer Science
Second Semester 2006-2007 (062)

ICS 410: Programming Languages (3-0-3) - (Section 02)

Syllabus

Instructor	Dr. Talal H. Maghrabi		**Office:** 22-308	**Phone:**	2083
Class Time:	09:00-09:50	S. M. W.	**Room:** 24-256		
Office Hours:	08:00-08:50	S. M. W.	(Or by appointment)		
E-Mail:	maghrabi@kfupm.edu.sa		**WebCT:** http://webcourses.kfupm.edu.sa		
Course Homepage:	http://faculty.kfupm.edu.sa/ics/maghrabi/ics410-062/ics410.htm				

Catalog Description:

Programming Paradigms: Object-oriented, imperative, functional, and logic. Application development in these paradigms. Fundamentals of Language Design: Syntax and Semantics. Language implementation: virtual machines; compilation, interpretation, and hybrid. **Prerequisite:** ICS 202

Course Objectives:	Upon completion of the course the students should be able to understand the 1. Basic issues in the design and implementation of programming languages. 2. Syntax and semantics specifications of programming languages. 3. Language design trade-offs. 4. Major programming paradigms: Object-Oriented, Procedural, Functional, and Logical.
Course Learning Outcomes:	Upon completion of the course, students will be able to: 1. identify various design issues in programming languages and illustrate with examples how the design issues have been handled in various popular programming languages. 2. understand and use formal tools like BNF/EBNF, attribute grammars, operational semantics, etc. to model syntax and semantics of programming languages. 3. Understand various design tradeoffs like cost and reliability, efficiency and flexibility, etc. needed to develop a programming languages. 4. Show basic program development skill in four programming paradigms: object-oriented, imperative, functional, and logic.

Textbook

"Concepts of Programming Languages," By. R. Sebesta, Seventh Edition, Addison Wesley, 2006, ISBN: 0 - 321- 31251-1.

Grading Policy:

Quizzes (**5**)			**15%**
Programming Assignments (**4**)			**20%**
Other Activities			**5%**
Major Exam I	(Saturday, 17 March, 2007	at 6:05 PM)	**15%**
Major Exam II	(Saturday, 5 May, 2007	at 6:30 PM)	**15%**
Final Exam	(Monday, 4 June, 2007	at 7:00 PM)	**30%**

Assignment Schedule:

Activity	Coverage	Issue Date	Due Date
Assignment 1	Imperative Paradigm: C Programming	Wed. 14 March	Wed. 28 March
Assignment 2	Functional Paradigm: Haskell Programming	Wed. 28 March	Wed. 11 April
Assignment 3	Logic Paradigm: Prolog Programming	Wed. 18 April	Wed. 2 May
Assignment 4	Language Design Issues	Mon. 7 May	Mon. 21 May

General Policies

Exams

- No make up quizzes or exams will be given.
- Final exam will be selective comprehensive. List of selected topics will be given well ahead of the final exam.

Attendance

- Regular attendance is the university requirement. Attendance will be taken at the beginning of every class. A **0.5 mark** will be deducted for **every** absence.
- **Two** late attendances are considered as **one** absence.
- Official excuse for any absence of a class must be presented **not later than a week** after that class.
- As soon as the number of absences goes beyond 20% of the held classes a written warning will be given by the instructor.
- DN grade will be given on the 10th unexcused absence.
- If number of absences go beyond the permissible and due to any reason DN grade has not be given, then for any absence beyond 9 (maximum permissible under university rules), one point will be deducted from the final score.

Class Discussion

- Participation in class discussion is very much encouraged. Asking questions during lectures helps both the instructor and the student. The instructor gets the feedback and the students get the point clarified.

Homework and Assignments Submission

- Homework and assignments can be submitted during the class time on the due date. No Late submissions are allowed.

Grading Issues

- After the return of graded material, all grading issues must be resolved within one week (i.e., 5 working days).

Course outline

Topic	Chapter	# Of Lectures
Module I: Basics of Programming Languages		
1. Preliminaries	1	3
2. Evolution of the Major Programming languages	2	Self Reading
3. Describing Syntax and Semantics	3 (3.1-3.5.1)	4
Module II: Programming Paradigms		
4. Imperative Programming Languages (Introduction to C)	Handouts	4
5. Functional Programming Languages (Introduction to Scheme)	15.1-15.3, 15.5, 15.9, 15.10	4
6. Logic Programming (Introduction to Prolog)	16.1 – 16.8	5
7. Object-Oriented Programming	12.3, 12.6	1

Topic	Chapter	# Of Lectures
Module III: Programming Languages design Issues		
8. Names, Bindings, Type Checking and Scopes	5	3
9. Data Types	6	3
10. Expressions and the Assignment Statements	7	2
11. Statement-Level Control Structure	8	3
12. Subprograms	9	4
13. Implementing Subprograms	10	4
14. Concurrency	13.1, 13.2, 13.9	1
15. Exception Handling	14.1, 14.1	1
Total Number of Lectures		42

Tips to Students

In order to perform well in this course the following points are recommended to be considered

- Your attitude *to learn and the effort you put in for this course alone* will be the primary agents that guide you in this course.

- For a 3-credit course, in addition to 3 hours of class work, it is required that student will put 6-hours of effort per week. Keeping a log of time devoted to study ICS 313 material can give you a very realistic picture.

- Emphasis is on reasoning and planned-regular work towards this course and **not on memorization**.

- Taking notes is important. Take a note of what you consider to be important. Write down bits and pieces of important information in your notes. On the same day after the class, review the relevant material and then prepare detailed notes. Such regular recollection, review, revision, and documentation will turn out to be very important in grasping the material and doing well in quizzes and examinations.

- Regular interaction during the class and during the instructor's office hours is encouraged. There is nothing like a silly question. By raising doubts and posing questions, you will be helping yourself, others in the class, and the instructor in steering the coverage towards the weak points. So keep one thing in mind during this course:
  - ➢ *It is better to raise a doubt or pose a question, rather than suppressing it and face difficulties later on.*

- If you do not follow the instructor's pace/language, request him to slow down. Likewise, when you do not understand certain words or sentences, request for an alternative explanation.

- Reading assignments, written homeworks, programming assignments, quizzes and examinations are part and parcel of the learning process. They are expected to supplement the coverage in the class. So treat them as learning tools rather than just as tools for evaluating your performance.

- There is no substitute for a regular (daily) preparation for this course. It will be far less effective, even if you spend two times more effort just before the examination days.

<u>Important Notes:</u>

Plagiarism, copying and other anti-intellectual behavior are prohibited by the university regulations. Violators may have to face serious consequences. See the attached clip from the university rules in Arabic.

Good luck and best wishes for a good semester

(Prepared by Dr. Talal Maghrabi; 10 February 2007)

جامعة الملك فهد للبترول والمعادن

القواعد التنفيذية لائحة الدراسة و الاختبارات

المادة الثامنة والثلاثون :

الغش في الاختبار ، أو الشروع فيه ، أو مخالفة التعليمات ، وقواعد إجراء الاختبار، أمور يعاقب عليها الطالب وفق لائحة تأديب الطلاب التي يصدرها مجلس الجامعة.

القواعد التنفيذية للمادة الثامنة والثلاثين:

١- الغش عمل مشين وغير أخلاقي ويجب على أعضاء هيئة التدريس والطلاب مراعاة الأمانة والصدق لضمان شرعية التقديرات الدراسية.

٢- إن جميع الأعمال والمتطلبات الأكاديمية يجب أن تعمل من قبل الطالب الذي تم تكليفه بهذه الأعمال أو المتطلبات بدون أية مساعدة غير مجازة من أي نوع.

٣- على مدرس المقرر الحرص على مراقبة وتدقيق الأعمال والمتطلبات الأكاديمية لتشجيع الطلاب على تحري الأمانة والصدق في تنفيذ هذه الأعمال.

٤- على مدرس المقرر الذي يكتشف طالباً غش في الواجب المنزلي أو في أي أعمال للمقرر أن يتخذ الإجراء المناسب كأن يقوم بإعطائه درجة صفر في ذلك الواجب المنزلي أو في ذلك العمل ، ثم يقوم مدرس المقرر برفع تقرير إلى رئيس القسم الذي يرفعه إلى عميد الكلية ، ولمجلس الكلية وحسب تقديره الاكتفاء بالعقاب

الذي اتخذه المدرس حيال الطالب أو رفع الحالة إلى لجنة تأديب الطلاب التي تقوم بدورها ببحث الحالة ورفع توصياتها إلى مدير الجامعة وفق لائحة تأديب الطلاب، ويجوز للطالب استئناف القرار لدى عميد شئون الطلاب في غضون أسبوع من إبلاغه بالقرار.

٥- على مدرس المقرر أو المشرف على اختبار مقرر، والذي يكتشف طالباً يغش أو يشرع في الغش في أي من الاختبارات التحريرية أن يقوم بإعطائه درجة صفر في ذلك الاختبار، وأن يرفع تقريراً متضمناً توصياته إلى رئيس القسم الذي يقدم المقرر ، ويمكن لمدرس المقرر أن يتخذ إجراء آخر ، وحسب تقديره ، كأن يعطي للطالب تقدير راسب (هـ ، F) في ذلك المقرر، وعلى رئيس القسم رفع تقريره إلى عميد الكلية. ولمجلس الكلية ، وحسب تقديره الاكتفاء بالعقاب الذي اتخذه المدرس حيال الطالب ، أو رفع الحالة إلى لجنة تأديب الطلاب التي تقوم بدورها ببحث الحالة ورفع توصياتها إلى مدير الجامعة وفق لائحة تأديب الطلاب.