University of Macau
Department of Computer and Information Science
CISB410 – Final Year Project
Syllabus
1st and 2nd Semester 201x/201y
Part A – Course Outline

Compulsory course in Computer Science

Catalog description:

6 credits. This course provides a chance to demonstrate what the students have learnt during the time in the University. It provides a platform to create an original application/research work with novel idea that make use of the skills the students have developed whilst studying for the degree. In addition, the projects are group based projects so that the students learn how to collaborate with others effectively.

This course forms a significant part of the degree programme and is conducted in last semester of the study. It is therefore important to participant in a project that the student is interested in. The student should be enthusiastic enough about to complete to a good quality project.

Prerequisites:

- Final year level

Major prerequisites by topic:

1. Programming languages and algorithms.
2. Software project management.
3. Information systems analysis and design
4. Applied mathematics and scientific computing

Course objectives:

1. To provide students with an excellent opportunity of in-depth exploration of a particular topic in computer and information science. [a,b,c,e,f,h,i,j,k,l]
2. To teach students how to apply the general knowledge of engineering & sciences and the emerging technology to solve an open-ended real-world problem with a critical manner. [a,j,k,l]
3. To further develop student's creativity and overall skills of problem formulation, development of appropriate methodologies, design and implementation of a well-designed solution. [b,c,e,h,j]
4. To practice data collection and analysis using different software packages and libraries. [b,k]
5. To complete an engineering project via a team work or contribution from the peers. [d,g]
6. To teach how to make good oral presentation of the project findings and write a technical report. [b,e,g]
7. To let students understand the professional practices in computer and information science and the impact of diverse solutions to the society. [f,h]

Topics covered:

One or more topics from the following areas:

1. Graphics and Visual Computing
2. Image Processing and Pattern Recognition
3. Programming Languages
4. Software Engineering
5. Databases and Data Mining
6. Information Retrieval and Web Mining
7. Machine Translation and Natural Language Processing
8. Distributed Computing
9. Geographic Information System

10. Bioinformatics
11. Business Intelligence
12. Other Topics in Computer and Information Science

Class/laboratory schedule:

Timetabled work in hours per week			No of teaching weeks	Total hours	Total credits	No/Duration of exam papers
Lecture	**Tutorial**	**Practice**				
Nil	Nil	Nil	28	Nil	6	Nil

Student study effort required:

Other study effort	
Meeting and discussion	100 hours
Project and literature survey	130 hours
Self-study	120 hours
Implementation	150 hours
Total student study effort	500 hours

Tentative Method of Assessment:

- Understanding of the Problem
    - Problem Objectives
    - Review of Literature
- Technical Achievement
    - Conceptualization and definition of the problem
    - Extension of Knowledge
    - Methodology, Implementation and Analysis
- Project Report
    - Organization, Writing style and Grammar
    - Relevance of Content

Course assessment:

The assessment of course objectives will be determined on the basis of:

1. Project evaluation
2. Report
3. Presentation

Contribution of course to meet the professional component:

This course prepares students with advanced knowledge in project design and various techniques in computer science.

Relationship to CS program objectives and outcomes:

This course primarily contributes to Computer Science program outcomes that develop student abilities to:

(a) an ability to apply knowledge of computing, mathematics, science, and engineering.
(b) an ability to design and conduct experiments, as well as to analyze and interpret data.
(c) an ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
(d) an ability to function effectively on multi-disciplinary teams.
(e) an ability to analyze a problem, and identify, formulate and use the appropriate application requirements for obtaining its computing solution.
(f) an understanding of professional, ethical, legal, security and social issues and responsibilities.
(g) an ability to communicate effectively.

(h) the broad education necessary to understand the impact of computing solutions in a global, economic, environmental, and societal context.
(j) a knowledge of contemporary issues.
(k) an ability to use the techniques, skills, and modern computer tools necessary for engineering practice.
(l) an ability to use the computer/IT tools relevant to the discipline along with an understanding of their processes and limitations.

The course secondarily contributes to Computer Science program outcomes that develop student abilities to:
(i) a recognition of the need for, and an ability to engage in life-long learning.

Relationship to CS program criteria:

Criterion	DS	PF	AL	AR	OS	NC	PL	HC	GV	IS	IM	SP	SE	CN
Scale: 1 (highest) to 4 (lowest)	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Discrete Structures (DS), Programming Fundamentals (PF), Algorithms and Complexity (AL), Architecture and Organization (AR), Operating Systems (OS), Net-Centric Computing (NC), Programming Languages (PL), Human-Computer Interaction (HC), Graphics and Visual Computing (GV), Intelligent Systems (IS), Information Management (IM), Social and Professional Issues (SP), Software Engineering (SE), Computational Science (CN).

Course content distribution:

Percentage content for			
Mathematics	Science and engineering subjects	Complementary electives	**Total**
5%	80%	15%	100%

Coordinator:

Department head or appointed representative(s)

Persons who prepared this description:

Dr. Leong Hou U , Dr. Fai Wong

Part B General Course Information and Policies

1st and 2nd Semester 201x

Instructor:	-	Office:	-
Office Hour:	-	Phone:	-
Email:	-		

Time/Venue: -

Grading Distribution:

Percentage Grade	Final Grade	Percentage Grade	Final Grade
100 – 93	A	92 - 88	A–
87 - 83	B+	82 - 78	B
77 - 73	B–	72 - 68	C+
67 - 63	C	62 - 58	C–
57 - 53	D+	52 - 50	D
below 50	F		

Comment:
The objectives of the meetings are to explain and supplement the related materials of the project. Students who wish to succeed in this course should learn the related techniques in advance. You are encouraged to look at other sources (papers, reference books, and technical reports, etc.) to complement the project.

Project Policy:
- Tentatively, there will be 1 progress presentation, 1 group presentation, 1 individual presentation, and 1 report.
- The report is due at the end of 2nd semester, no late report is accepted.
- The course grade will be based on the marks of presentation and report quality.

Note
- Check course web pages for announcement. Report any mistake on your grades within one week after posting.
- No make-up presentation is given except for CLEAR medical proof.
- Plagiarism is absolutely prohibited by the university.

Rubric for Program Outcomes (a) to (l)

Rubric for (a)	5 (Excellent)	3 (Average)	1 (Poor)
Understand the theoretic background	Students understand theoretic background and the limitations of the respective applications.	Students have some confusion on some background or do not understand theoretic background completely.	Students do not understand the background or do not study at all.
Use a correct model and formulation correctly	Students choose a model correctly and properly apply correct techniques.	Students choose a wrong model sometime, use a wrong formula, or a different technique.	Students use a wrong model and wrong formula, or do not know how to model.
Compute the problem correctly	Students use correct techniques, analyze the problems, and compute them correctly.	Students sometime solve problem mistakenly using wrong techniques.	Students do not know how to solve problems or use wrong techniques completely.

Rubric for (b)	5 (Excellent)	3 (Average)	1 (Poor)
Conduct experiments	Student successfully completes the experiment, records the data, analyzes the experiment's main topics, and explains the experiment concisely and well.	Student successfully completes the experiment, records the data, and analyzes the experiment's main topics.	Student either does not complete the experiment successfully, or completes it successfully but does not record the correct data.
Design experiments	Student understands what needs to be tested and designs an appropriate experiment that takes into account the limitations of the equipment and measurement accuracy.	Student understands what needs to be tested and designs an appropriate experiment, but may not fully understand the limitations of the measurements.	Student does not understand what needs to be tested and/or does not design an appropriate experiment.

Rubric for (c)	5 (Excellent)	3 (Average)	1 (Poor)
Design capability and design constraints	Student understands very clearly what needs to be designed and the realistic design constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.	Student understands what needs to be designed and the design constraints, but may not fully understand the limitations of the design constraints.	Student does not understand what needs to be designed and the design constraints.
Process to meet desired needs	Student understands very clearly the process of the design.	Student understands what the needs of the process design, but may not fully understand the limitations of the design constraints.	Student does not understand the process.

Rubric for (d)	5 (Excellent)	3 (Average)	1 (Poor)
Ability to work in teams	Performance on teams is excellent with clear evidence of equal distribution of tasks and effort as well as frequent meetings of the team members.	Performance on teams is acceptable with one or more members carrying a larger amount of the effort as well as infrequent meetings of the	Performance on teams is poor to unacceptable with one or two members clearly carrying the majority of the effort as well as inadequate team

		members or one or more members being absent from several meetings.	meeting or one or more members missing the majority of the meetings.
Multi-disciplinary teams	Team consists of members from two or more different engineering/science/business fields (this could contain some members not actually enrolled in the course but interacting as part of a competition, collaboration, etc.)	Team consists of members from two or more concentrations within the Department of Computer and Information Science.	Team consists of members from the same concentration within the Department of Computer and Information Science.

Rubric for (e)	**5 (Excellent)**	**3 (Average)**	**1 (Poor)**
Identify applications in engineering systems	Students understand problem and can identify fundamental formulation.	Students understand problem but cannot apply formulation, or cannot understand problem.	Students cannot identify correct terms for engineering applications.
Modeling, problem formulation and problem solving	Students choose and properly apply the correct techniques.	Students model correctly but cannot select proper technique or model incorrectly but solve correctly accordingly.	Students at loss as to how to solve a problem.

Rubric for (f)	**5 (Excellent)**	**3 (Average)**	**1 (Poor)**
Design	Understand how to critique and analyze design tradeoffs and constraints with respect to safety, liability, and integrity of data, and context of use.	Have knowledge of safety, liability, and integrity of data, and context of use but cannot analyze thoroughly.	No awareness of importance of safety, liability, and integrity of data, and context of use.
Professional engineering practice	Understand how to critique and analyze tradeoffs and constraints with respect to research issues of credit and authorship, integrity of data, and informed consent.	Have knowledge of credit and authorship, integrity of data, and informed consent but cannot completely identify ownership in practical.	No awareness of credit and authorship, integrity of data, and informed consent.
Group relations	Understand how to critique and analyze tradeoffs and constraints with respect to conflict of interest, bribery, professional dissent, authorship, and discrimination.	Have partial knowledge of conflict of interest, bribery, professional dissent, authorship, discrimination but cannot apply it in practice correctly.	No awareness of conflict of interest, bribery, professional dissent, authorship, and discrimination.

Rubric for (g)	**5 (Excellent)**	**3 (Average)**	**1 (Poor)**
Professional impact	Student's/Team's/Group's document(s)/presentation(s) is/are considered to be of professional quality.	Student's/Team's/Group's document(s)/presentation(s) is/are considered acceptable for college level work.	Student's/Team's/Group's document(s)/presentation(s) is/are considered unacceptable for college level work.
Written component	Document is nearly error free with sophisticated use of	Document contains some errors with a somewhat	Document contains many errors, very colloquial

	vocabulary, formatted properly, with well-developed concise sentences and paragraphs.	colloquial vocabulary, minor formatting issues, with some organizational issues that do not interfere with communication.	vocabulary, with severe organizational issues that interfere with communication. Document would be considered unacceptable.
Oral component	Presentation is consistent, uniform, clear, direct, complete and captivating with very clear fonts and graphics with an excellent layout that clearly presents the technical content.	Presentation is somewhat inconsistent between speakers, occasionally difficult to hear, with an acceptable layout containing acceptable fonts and graphics that adequately presents the technical content.	Presentation is very inconsistent between speakers, difficult to hear with a poor layout containing illegible fonts and graphics that poorly presents the technical content. Would be considered unacceptable.

Rubric for (h)	5 (Excellent)	3 (Average)	1 (Poor)
Scope of content	Students will demonstrate material, items, or topics characterized by a sophisticated array of information, insight, and understanding.	Students demonstrate significance reflecting an acceptable degree of perception and thoughts.	Students have limited abilities to relate, incorporate, or demonstrate knowledge of subject with a dynamic breadth.
Impact of process	Students will employ techniques, designs, ideas, and knowledge demonstrating a profound ability to improve and possess broad applications with a keen a series of actions, changes, or functions.	Techniques, designs, ideas, and knowledge present some understanding and ability to demonstrate progression, significance, and influence.	Techniques, designs, ideas, and knowledge present limited progression, significance, and influence.

Rubric for (i)	5 (Excellent)	3 (Average)	1 (Poor)
Research/ gathering information	Comprehensive collection of information on a subject, including state-of-the-art and background.	Collects adequate information on a subject.	Collects minimal information on a subject.
Analysis/ evaluation	Detailed analysis accounting for all the information and conclusions are well supported.	Some analysis done but somewhat shallow; some supporting evidence.	Analysis simply involves restating gathered information; claims not supported by evidence.

Rubric for (j)	5 (Excellent)	3 (Average)	1 (Poor)
Relevance to the present time	Student displays an understanding of the theoretical or practical impact and an ability to correlate a subject, perception, communication, association and reasoning from a global and societal perspective.	Student is able to display an understanding of current topics and issues with some knowledge regarding their impact in a bigger global and societal sense.	Student has difficulty demonstrating an awareness or familiarity with current topics and issues relevant to most current global and societal affairs.

Rubric for (k)	5 (Excellent)	3 (Average)	1 (Poor)
Use modern	Student applies the principles,	Student applies the principles,	Student does not apply

principles, skills, and tools in engineering practice	skills and tools to correctly model and analyze engineering problems, and understands the limitations.	skills and tools to analyze and implement engineering problems.	principles and tools correctly and/or does not correctly interpret the results.

Rubric for (l)	**5 (Excellent)**	**3 (Average)**	**1 (Poor)**
Use modern computer/IT tools relevant to the discipline	Student uses computer/IT tools relevant to the engineering discipline, and understands their limitations.	Student uses computer /IT tools relevant to the engineering discipline.	Student does not use computer/IT tools relevantly, and does not understand their limitations.