Course Specification

Name of Institution Mahidol University

Campus/faculty/department Salaya campus

Mahidol University International College

Science Division

Section 1 General Information

1. Course code and course title

Thai ICCS 331 การจัดองค์ประกอบภาษาชุดคำสั่ง

English ICCS 331 Organization of Programming Languages

2. Number of credit 4 (4-0-8)

(lecture 4 hours – laboratory 0 hours/ self study 8 hours/ week)

3. Curriculum and type of subject

3.1 Curriculum offered in international curriculum

3.2 Type of subject Major Required course, Computer Science

4. Responsible faculty member Full-time faculty members, Mahidol University International College, Mahidol University

5. Trimester / year of study

5.1 Trimester 2 and 3 / Third year

5.2 Number of students _____ students

6. Pre-requisites ICCS 101 Introduction to Computer Programming

ICCS200 Data Structures and Algorithms

7. Co-requisites -

8. Venue of study Mahidol University, Salaya campus

9. Date of latest revision March 2011

Section 2 Goals and Objectives

1. Goals

Study of features of programming languages and of the methods used to specify and translate them. Topics include LISP, virtual machines, syntax and semantics, binding times, scoping rules, implementation choices, procedure calling, and parameter passing.

2. Objectives of development/revision

After successful completion of this course, students should be able to understand the spectrum of programming languages so they can choose the suitable language for the job or create the right language for the job if no appropriate one exists.

Section 3 Course Management

1. Course descriptions

โครงสร้างการนิยามภาษา การประมวลผลภาษาโปรแกรม ประเภทและโครงสร้างของข้อมูล โครงสร้างการควบคุมการประมวลผล ข้อมูลการจัดการการจัดเก็บ วากยสัมพันธ์และการแปลสภาวะแวดล้อม การปฏิบัติการและการโปรแกรม การเปรียบเทียบภาษาโปรแกรมทั้งซีซีพลัสพลัส ลิสพ์ เอสคิวแอล

Language definition structure; programming language processors; data types and structures; control structures and data flow; storage management; syntax and translation; operating and programming environments; programming languages such as C, C++, LISP, and SQL; comparison.

2. Credit hours / trimester

Lecture	Additional class	Laboratory / field trip/ internship	Self study
44 hours (4 hour x 11	-	-	88 hours (8 hours x 11

weeks)			weeks)

3. Number of hours that the lecture provides individual counseling and guidance

1 hour / week

Section 4 Development of Students' Learning Outcome

1. Expected outcome on students' skill and knowledge

Students will be able to apply the knowledge from lectures and with the ideas received from analysis and synthesis to set up solutions/ precautions to benefit individuals;

2. Teaching methods

Course organized using lecture, assignments, and quizzes.

3. Evaluation methods

1. Morality and Ethics

1.1 Expected outcome on morality and ethics

- ●)1(To posses morality and ethics
- ●)2(To have self-discipline, honesty, kindness, self- responsible and social responsibility
- ●)3(To demonstrate academic ethical behavior
- ●)4(To respect others' rights and be a good listener
- ●)5(To respect rules and regulations
- ○)6(To have good attitude toward professors/career
-)7(To demonstrate Leadership, team player

1.2 Teaching methods

Learning Centered Education : Emphasis on knowledge development, important skills in career development and living, encourage students to use their full potentials

(1) Lecture

(2) Assignments

(3) Quizzes

1.3 Evaluation methods

(1) Written examination

(2) Class attendance

(3) On-time submission of assignments and their quality

2. Knowledge development

2.1 Expected outcome on knowledge development

-)1(To posses basic knowledge, theories and concepts towards the understanding of self, society, surrounding in order to be well-rounded person
-)2(To process the knowledge related to principles, theories and practice in the course
-)3(To integrate the knowledge to other related subjects
-)4(To remain current in research and new knowledge

2.2 Teaching methods

Learning Centered Education : Emphasis on knowledge development, important skills in career development and living, encourage students to use their full potentials

(1) Lecture

(2) Assignments

(3) Quizzes

2.3 Evaluation methods

(1) Written examination

(2) Class attendance

(3) On-time submission of assignments and their quality

3. Intellectual development

3.1 Expected outcome on intellectual development

-)1(To have systematic and analytical thinking
-)2(To be able to search, consolidate and evaluate ideas and evidence for problem solving
-)3(To be able to apply knowledge and experience to analyze and creatively solve problems both in general and academic

3.2 Teaching methods

(1) Lecture

(2) Assignments

(3) Quizzes

3.3 Evaluation methods

(1) Written examination

(2) Assignments

(3) Quizzes

4. Interpersonal relationship and responsibility

4.1 Expected outcome on Interpersonal relationship and responsibility

-)1(To posses good interpersonal relationship skills (self esteem and dignity) and have respect for the rights and value of others

)2(To possess leadership and initiative in problem solving

)3(To be constructive team member (in various roles) and be responsible for assignment tasks, professional and society

4.2 Teaching methods

(1) Lecture

(2) Assignments

(3) Quizzes

4.3 Evaluation methods

(1) Written examination

(2) Assignments

(3) Quizzes

5. Mathematical analytical thinking, communication skills, and information technology skills

5.1 Expected outcome on mathematical analytical thinking, communication skills, and information technology skills

-)1(To be able to select and apply appropriate statistical and mathematical methods to research problems
-)2(To be able to apply information technology for data gathering, processing, interpreting and presenting information/results

)3(To have the ability to communicate effectively and select appropriate

methods of presentation

5.2 Teaching methods

(1) Lecture

(2) Assignments

(3) Quizzes

5.3 Evaluation methods

(1) Written examination

(2) Assignments

(3) Quizzes

Section 5 Teaching and Evaluation Plans

1. Teaching plan

Week	Topic	**Hours**	**Teaching methods/ multimedia**	**Instructor**
1	- Programming languages types - Criteria for judging a good programming language - History of programming languages	**4**	Interactive lecture	
2	- Compiler theory, general - Syntax o Tokens, lexemes o Recognition, generation, derivations o Chomsky Hierarchy of Grammars o FSG, FA, and regular expressions; CSG, BNF, EBNF and parse trees; PDA and LBA;	**4**	Interactive lecture	

	Turing Machines o Parsing o Ambiguous grammars			
3	Semantics Translation	**4**	Interactive lecture	
4	Learning Perl G Learning C++	**4**	Interactive lecture	
5	Binding times and lifetime Scoping Types	**4**	Interactive lecture	
6	Mid-Term Exam			
7	G Data structures Arrays Variables and constants	**4**	Interactive lecture	
8	Control structures Functional abstraction: Subprograms	**4**	Interactive lecture	
9	Data abstraction Object-based programming	**4**	Interactive lecture	
10	Functional programming G Constraint programming: Logic programming languages G Concurrency (parallelism)	**4**	Interactive lecture	
11	Review	**4**	Interactive lecture	
12	Final exam			

2. Evaluation plan

Expected outcomes	Methods / activities	Week	Percentage

Section 6 Teaching Materials and Resources

1. Texts and main documents

Robert W. Sebesta. *Concepts of Programming Languages*, seventh edition. Pearson/Addison-Wesley,2006.

2. Documents and important information

3. Documents and recommended information

Section 7 Evaluation and Improvement of Course Management

1. Strategies for effective course evaluation by students

- 1.1 Evaluation of peers by students
- 1.2 Student evaluation
  - 1.2.1 Course content
  - 1.2.2 Course management
  - 1.2.3 Suggestions
  - 1.2.4 Overall opinion

2. Evaluation strategies in teaching methods

- 2.1 Student evaluation
- 2.2 Presentation

3. Improvement of teaching methods

Workshop on course improvement with the participation of all lecturers in this course

4. Evaluation of students' learning outcome

Analysis of students' learning outcomes using scores from class attendance, group activity and presentation of project and poster presentation

5. **Review and improvement for better outcome**

   Meeting of lecturers to review the course before semester starts and before each period of teaching