

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)	EGCI 111	การเขียนโปรแกรมคอมพิวเตอร์
(English)	EGCI 111	Computer Programming

2. Number of Credits 4(3-2-7) (Lecture-Lab-Self Study)

3. Curriculum and Type of Subject

3.1 Curriculum	Bachelor of Engineering (Computer Engineering)
3.2 Type of Subject	Require Course

4. Responsible Faculty Member

TBA

5. Trimester / Year of Study

5.1 1 st Trimester / 1 st Year of Study
5.2 Number of Students 5-30 Students

6. Pre-requisite(s) None

7. Co-requisite(s) None

8. Venue of Study Mahidol University, Salaya Campus

9. Date of Latest Revision October 2011

Section 2 Goals and Objectives

1. Goal

1. Students should explain basic principle of computer.
2. Students should be able to design and write a high-level programming language.
3. Students should be able to apply computer programming to solve engineering problems.

2. Objective of development revision

To update knowledge content of course.

Section 3 Course Management

1. Course Description

(Thai) แนะนำแนวคิดคอมพิวเตอร์ ส่วนประกอบต่างๆ ของคอมพิวเตอร์ ฮาร์ดแวร์และซอฟต์แวร์ การโต้ตอบระหว่างฮาร์ดแวร์และซอฟต์แวร์ แนวคิดการประมวลผลข้อมูลอิเล็กทรอนิกส์ (อีดีพี) แนะนำการออกแบบและการสร้างโปรแกรมโดยใช้ภาษาระดับสูง: ชนิดข้อมูลและนิพจน์ ข้อความสั่งเชิงวนซ้ำและเชิงควบคุมแบบมีเงื่อนไข ฟังก์ชัน ตรรกะแบบบูล โครงสร้างแถวลำดับ และโครงสร้างระเบียน ตัวชี้ แนะนำการเรียกซ้ำ

(English) Introduction to computer concepts, computer components, hardware and software, hardware and software interaction, and Electronic Data Processing (EDP) concepts. Introduction to program design and implementation using a high-level language: types and expressions, iterative and conditional control statements, functions, Boolean logic, array and record structures, pointers, and introduction to recursion.

2. Credit Hours / Trimester

Lecture (Hours)	Additional Class (Hours)	Laboratory/Field Trip/Internship (Hours)	Self-study (Hours)
33 Hours (3 Hours × 11 Weeks)	-	22 Hours (2 Hours × 11 Weeks)	77 Hours (7 Hours × 11 Weeks)

3. Numbers of hours that the lecturer provides individual counseling and guidance

1 Hour/Week

Section 4 Development of Students' Learning Outcome

1. Expected outcome on students' skill and knowledge

Student will be able to apply the knowledge from lecturer and additional research with the ideas received from analysis and synthesis to set up solutions / precautions to benefit individuals and their community.

2. Teaching Methods

- Lecture
- Self-study
- Practical, Laboratory, and Exercises

3. Evaluation methods

1. Morality and Ethics

1.1 Expected outcome on morality and ethics:

- 1.1.1 To be aware of values and morality, ethics, scarification, and honesty.
- 1.1.2 To process self-discipline, punctuality, self-responsibility, and social responsibility.
- 1.1.3 To process leadership and supporter skills and be able to work in a team with integrity and cooperation.
- 1.1.4 To demonstrate good listening behavior and have respect for the rights and value of others.
- 1.1.5 To pay respect to the rule of organization and social.
- 1.1.6 To demonstrate the ability to analyze ethical impacts of computer usage to personals, organizations, and social.
- 1.1.7 To demonstrate good academic ethical behaviors.

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

- 1.2.1 Lecture
- 1.2.2 Emphasis on morality and ethics
- 1.2.3 Group assignments
- 1.2.4 Group discussion

1.3 Evaluation methods:

- 1.3.1 Written examination
- 1.3.2 Presentation
- 1.3.3 Class attendance, class participation, and behavior in class
- 1.3.4 On-time submission of reports and assignments and their quality

2. Knowledge Development**2.1 Expected outcome on knowledge development:**

- 2.1.1 To process the knowledge related to principles, theories, and practice in the course.
- 2.1.2 To be able to analyze, understand, and explain the computer requirements and be able to apply knowledge and skills using the appropriate tools to solve a problem.
- 2.1.3 To be able analyze, design and install and/or evaluate computer components to meet the requirements of the users.
- 2.1.4 To have the ability to remain current in research, and pursue new knowledge and perform ability to apply the knowledge.
- 2.1.5 To know, understand, and perform eagerness to develop computer knowledge and skills continuously.
- 2.1.6 To have a breadth knowledge in order to oversee the changes and understand the impact of new technology.
- 2.1.7 To have a hand-on experience in software development and/or software applications.
- 2.1.8 To demonstrate knowledge integration with other related sciences.

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

- 2.2.1 Lecture and in-class participation
- 2.2.2 Case studies with past experiences and current events
- 2.2.3 Self study

2.3 Evaluation methods:

- 2.3.1 Written examination
- 2.3.2 Quality of reports and assignments

3. Intellectual Development

3.1 Expected outcome on intellectual development:

- 3.1.1 To have discretionary and systematic thinking skill.
- 3.1.2 To have the ability to search, consolidate, and evaluate ideas and evidence for problem solving.
- 3.1.3 To be able to apply knowledge and experience to analyze and creatively solve problems both in general and in academic contexts.
- 3.1.4 To be able to apply knowledge and experience to synthesize solution and precautions.

3.2 Teaching method:

- 3.2.1 Systematic problem solving examples and case studies with past experiences and current events
- 3.2.2 Self Study

3.3 Evaluation methods:

- 3.3.1 Written examination
- 3.3.2 Presentation
- 3.3.3 Quality of reports and assignments

4. Interpersonal Relationship and Responsibility

4.1 Expected outcome on interpersonal relationship and responsibility:

- 4.1.1 To perform good communication skills with various groups of people.
- 4.1.2 To be a constructive team member (in various roles).
- 4.1.3 To process the knowledge of the course to identify social problems.
- 4.1.4 To demonstrate self and team responsibility.
To have initiative in problem solving.
- 4.1.6 To take responsibility in a life-long learning.

4.2 Teaching methods:

- 4.2.1 Group discussion in case studies
- 4.2.2 Group discussion
- 4.2.3 Group assignment

4.3 Evaluation methods:

- 4.3.1 Presentation
- 4.3.2 Class attendance, class participation, and behavior in class
- 4.3.3 On-time submission of reports and assignments and their quality

5. Mathematical Analytical Thinking, Communication Skills, and Information Technology Skills**5.1 Expected outcome on mathematical analytical thinking, communication skills and information technology skills:**

- 5.1.1 To be able to select and apply existing tools for computer related work.
- 5.1.2 To possess the ability to apply information technology for data gathering, processing, interpreting, and presenting information/results.
- 5.1.3 To have the ability to communicate effectively and select appropriate methods for presentation.
- 5.1.4 To use information technology appropriately.

5.2 Teaching methods:

- 5.2.1 Computer programming with exercises.
- 5.2.2 Case studies with past experiences and current events
- 5.2.3 Group discussion
- 5.2.4 Group assignment
- 5.2.5 Self Study

5.3 Evaluation methods:

- 5.3.1 Written examination
- 5.3.2 Presentation with appropriate technology
- 5.3.3 Class attendance, class participation, and behavior in class
- 5.3.4 On-time submission of reports and assignments and their quality

Section 5 Teaching and Evaluation Plans

1. Teaching plan

Week	Topics	Hours			Teaching Methods/ Multimedia	Instructor
		Lecture	Lab	Self-Study		
1	Introduction to Computers, Algorithms and Flowcharts.	3	2	7	Lecture and Programming Exercises	Dr. Tanasanee Phienthrakul
2	Basic C Programming: Variables, Data Types, and Operators	3	2	7	Lecture and Programming Exercises	
3	Control Statements	3	2	7	Lecture and Programming Exercises	
4	Loops	3	2	7	Lecture and Programming Exercises	
5	Arrays	3	2	7	Lecture and Programming Exercises	
6	Strings	3	2	7	Lecture and Programming Exercises	
	Midterm					
7	Pointers	3	2	7	Lecture and Programming Exercises	
8	Modular Program Design	3	2	7	Lecture and Programming Exercises	
9	Functions	3	2	7	Lecture and Programming Exercises	
10	Structures and Unions	3	2	7	Lecture and Programming Exercises	
11	Files	3	2	7	Lecture and Programming Exercises	
	Final Examination					
	Total	33	22	77		

2. Evaluation Plan

Expected outcomes	Methods / activities	Week	Percentage
1.1.1, 1.1.2, 1.1.5, 1.1.6, 4.1.2, 4.1.4, 4.1.5, 5.1.4	Attendance and In-Class Behavior	1-11	10%
2.1.1, 2.1.3, 3.1.1, 3.1.3, 3.1.4, 5.1.2	Midterm Examination Final Examination	After Week 6 th After Week 11 th	30% 30%
2.1.7, 2.1.8, 3.1.3, 5.1.1	Exercises and Programming	1-11	30%

Section 6 Teaching Materials and Resources

1. Texts and Main Documents

Kernighan BW, Ritchie DM. *The C programming language*. 3rd ed. Upper Saddle River (NJ): Prentice Hall, 1988.

Deitel HM, Deitel PJ. *C: how to program*. 5th ed. Upper Saddle River (NJ): Prentice Hall, 2006.

Hanly JR, Koffman EB. *Problem solving and program design in C*. 6th ed. Boston(MA): Addison-Wesley, 2009

2. Documents and Important Information

None

3. Documents and Recommended Information

Website: <http://www.cprogramming.com/>

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 instructors in the 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

Review the course before trimester starts and before each teaching period

Symbol ● represents main responsibility / Symbol ○ represents minor responsibility / Space represents no responsibility

These symbols will appear in Curriculum Mapping