

## Computer Programming and Practice

Course Name	Course section (credit/hours)		Required course(4/5)			course code	F010
	course item					course component	
	Target students Division/major/grade					opening semester	2021 1ST SEMESTER
	Class time and classroom		Tue 2(Pal333) Tue 3(Pal333)Tue 15:00~16:30 (Pal309)Fri 15:00~16:30 (Pal309)			English Grade	A(100%English)
Reference to this course	Credit compositon		Theory(0) + Design(0) + Practice(0)				
	Prerequisite courses		없음				
	Related basic courses						
	Recommanded concurrent courses		컴퓨터프로그래밍				
Instructor	Name (title/division)		Kristin Chung(Assistant Professor, Software and Computer Engineering)				
	Office Room Number	팔달관1010호	Extension Number	1644	e-mail	chungkc@ajou.ac.kr	
	Office hour				Homepage address		
Teaching Assistant	Name (title/division)						
	Office Room Number		Office phone Number		e-mail		

### 1. Course Introduction

This class is targeted to freshmen student and focuses on the programming design aspect, and C language is used as an instrument to achieve this goal. This class is closely synchronized with the Computer Programming class for C language learning. (\*\* refer to the pre-requisite section \*\*)

The scope of the application of the computer system are continuously expanding not just to the personal computers but also to home appliances, automobile, cellular phone and many more areas of our life. Software is the focal element that makes the systems to operate as intended, and also creating new values on the existing system.

The main objectives of the Computer Programming Design class is to teach the students the necessary knowledge needed to design and develop the software system.

The understanding of programming language and programming paradigm is required skill to design the computer program to satisfy the requirements of the program. This class utilizes the example programs of the various themes those are designed to meet these needs. This class leads the students to learn the basic knowledge and skills related to the programing development. Students gradually achieve the program development and software testing capabilities and also learn how to utilize of the existing source code through the self-study method provided in this class.

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## 2. Course Objectives & course outcome

### 1. Teaching Objectives (교육목표)

- 1) Students should analyze, design and implement the software engineering problem by themselves.
- 2) Students should be able to apply their programming skill to the industry problems.
- 3) Students should produce a reliable software through validation.
- 4) Students should learn how to use the existing and the open-source code and apply to their problem solving.

### 2. Class achievements (교과목 학습성과)

- 1) Students are equipped with programming skill with C language (학습성과 1, 2)
- 2) Students develop the quality program through the understanding and performing the software development process (학습성과 3, 5)
- 3) Students understand the code written by other engineers by reviewing the code and by following the coding standard (학습성과 2, 4)
- 4) Students realize the engineering problem with C program (학습성과 4, 5, 8)
- 5) Students effectively communicate the technical contents to others through documentation of the software artifacts (학습성과 3)

## 3. Class types and activities

### 1. Class Format

- 1) Both lecture and lab sessions will be given in a class
- 2) Lab is main session of the class. Students will be led to follow the instructions provided for the weekly lab projects and learn the concept of the project by executing and confirming the results of the lab project.
- 3) Lecture will simply cover the major concept of the weekly topics.
- 4) Lecture may cover the analysis, design, implementation, and validation techniques of the software development.
- 5) Design project will be assigned to the individual student. Appropriate level of programming problem theme for the design project will be chosen per the progress of the class.

### 2. Weekly Class Topics

- 1) Weekly class topic will be chosen per lecturer's plan. Its theme will be common and practical problems so that students can easily associate with the topics.
- 2) Additional lecture and lab can be provided if there is a need for introducing new contents besides the one already planned.
- 3) Even though this class needs to be taken with the Computer Programming class, the weekly class topic can be chosen independent of the lecture-progress of the Computer Programming class.

#### 4. Teaching Method

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> lecture                          | <input checked="" type="checkbox"/> discussion and debate         |
| <input type="checkbox"/> team project(presentation and case studies) | <input checked="" type="checkbox"/> experiments(role-playing,etc) |
| <input checked="" type="checkbox"/> designing and production         | <input type="checkbox"/> on-site learning(on-site training)       |
| <input type="checkbox"/> others                                      |   |

#### 5. Support Systems in Use

- |  |   |   |
|--|---|---|
| <input checked="" type="checkbox"/> AjouBb               | <input type="checkbox"/> automatic recording system | <input type="checkbox"/> web-based assignment |
| <input type="checkbox"/> cyber lecture                   | <input type="checkbox"/> online content             |   |
| <input type="checkbox"/> class behavior analyzing system | <input type="checkbox"/> others                     |   |

#### 6. Teaching Tools

- |   |   |   |
|---|---|---|
| <input checked="" type="checkbox"/> PBL(Problem Based Learning) | <input type="checkbox"/> CBL(Case Based Learning) | <input type="checkbox"/> TBL(Team Based Learning)           |
| <input type="checkbox"/> UR(Undergraduate Research)             | <input type="checkbox"/> FL(Flipped Learning)     | <input type="checkbox"/> DSAL(Data Sciencd Active Learning) |
| <input type="checkbox"/> others                                 |   |   |

#### 7. Evaluation method of course outcome

Evaluation Item	The Number of Times	Evaluation Proportion	Remarks
Attendance		5	
midterm exam	1	25	
final exam	1	25	
quiz			
presentation			
discussion			
homework		30	
etc		20	in-lab projects, ABF test result
study hours	10 hours		

## 8. Textbook and Reference material

Main/Sub	Title	Writer	Publisher	Publication year
Main	A Structured Programming Approach Using C, 3rd ed.	B. Forouzan외 1인	Thomson	2007
Sub	A Book on C, 4th ed.	Kelly & Pohl	Addison Wesley	2010
Main	The Coding Strategy for Troubleshooting	최경희외 9인, 역 Kristin H. Chung	Human Science	2018
Main	이야기로 시작하는 C 프로그래밍	최경희외 3인	아주대학교 출판부	2016

## 9. Class system and Class shedule

This class mainly executes the weekly planned lab projects which include the specific topics. Students learn the analysis, design, implementation, and validation skills through the execution of the lab projects. Instruction for each lab project will be given to the student. It defines the detailed requirements needed for the students to learn from the project topic.

Students will execute the lab project by following the lab instruction, and gradually learn the necessary programming related skills through the process of the evaluating the results.

Following topics are included in the course contents:

- Usage of Integrated Development Environment (IDE) : Visual Studio
- Programming using the external module
- Understanding of Algorithm definition, and implementation
- Understanding relationship between function and module
- Program design
- Data structure and its application

### < Schedule >

\* language : K-korean, E-English

Weeks	Title of lecture	language	time distribution(minutes)			Teaching Method	evaluation method
			theory	design	experiment practice		
1	Creating C program with Visual Studio	K/E	5	3		lecture and lab	Lab list, desing project & Final exam
2	First project (Hello World printing) & Comparing Two Integers	K/E	5	3		lecture and lab	Lab list, desing project & Final exam
3	Solving Simple and Linear Equations	K/E	5	3		lecture and lab	Lab list, desing project & Final exam
4	Finding simple and randomly generated numbers	K/E	5	3		lecture and lab	Lab list, desing project & Final exam
5	Finding GCD and LCM	K/E	5	3		lecture and lab	Lab list, desing project & Final exam

### < Schedule >

\* language : K-korean, E-English

Weeks	Title of lecture	language	time distribution(minutes)			Teaching Method	evaluation method
			theory	design	experiment practice		
6	Decimal to Binary, Binary to Decimal conversion	K/E	5	3		lecture and lab	Lab list, desing project & Final exam
7	Solving $f(x) = 0$ and more	K/E	5	3		lecture and lab	Lab list, desing project & Final exam
8	Midterm exam/project	K/E	5	3			
9	Array and Image	K/E	5	3		lecture and lab	Lab list, desing project & Final exam
10	Array of Structure	K/E	5	3		lecture and lab	Lab list, desing project & Final exam
11	Multi-dimensional array	K/E	5	3		lecture and lab	Lab list, desing project & Final exam
12	Designing recursive function	K/E	5	3		lecture and lab	Lab list, desing project & Final exam
13	Postfix and Infix expressions	K/E	5	3		lecture and lab	Lab list, desing project & Final exam
14	Finite State Machine and Token parsing	K/E	5	3		lecture and lab	Lab list, desing project & Final exam
15	Summary	K/E	5	3		lecture and lab	Lab list, desing project & Final exam
16	Final exam	K/E	5	3		programming test	

### 10. Contribution index of the course for attaining ABEEK program outcomes

course outcome	contribution scale
No Data	

### 11. Analysis of improved matters for the previous semester

## 12.2 Training contents for design & experiment

No	1	Title	개인별 과제
content	강의시간에 학습한 소프트웨어개발절차에 따라 목표설정, 분석, 제작 및 시험평가 과정을 매 과제별로 진행한다. 개별 과제는 개인별로 진행하며, 주제는 과목 담당 교수에 의해 부여된다.		
composition factor for design & experiment			
Realistic restriction factor	윤리,보건 및 안전,산업표준,		
evaluation method & reference	1. 분석 및 설계 보고서 평가 2. 결과물 평가		
No	2	Title	설계수행을 위한 실습문제 해결
content	매 주차별 강의 주제이해 및 설계과제 수행 준비를 위한 문제들이 주어져지며, 이를 통해 절차에 따른 문제 해결 능력을 배양함		
composition factor for design & experiment	합성,분석,		
Realistic restriction factor	윤리,보건 및 안전,산업표준,		
evaluation method & reference	매 수업 시간 종료 후 작성된 답지를 제출하여 적절한 수행 여부를 평가함. 평가는 수행 수준을 바탕으로 80% 이상의 내용 수행시 Pass, 그 이하는 fail을 부여함		

## 13. Reference items

This class will consider the freshmen students are the main target of the course. The main objective of this class is to train students the program development method and programming skills..

It is mandatory to take this class with “Computer Programming” class at the same time. Exceptions to this is as follows:

- For the students who were admitted to the school prior to year 2011 and take the “Computer Programming” class first time: it is not a mandatory to take this class, but it is strongly recommended to take both class at the same time.
- For the students who were admitted to the school prior to year 2011 and took the “Computer Programming” class but taking it again: it is not a mandatory to take this class, but it is strongly recommended to take both class at the same time.
- It is not allowed to take this class only without taking the “Computer Programming” class (especially junior and senior students). Exception to this is the students who are taking this class again.