☑ Bachelor's Degree

☐ Master's Degree

Course Specification

Course Code: FOE1101

Course Title: Computer Programming

Credits: 3(2-2-5)

Programs: Bachelor of Engineering

Semester: 1   **Academic Year:** 2024

Faculty of Engineering and Industrial Technology
Suan Sunandha Rajabhat University

Section 1 - General Information

1. Course code and course title

Course code: FOE1101

Course title (English): Computer Programming

ชื่อวิชา (ภาษาไทย): การโปรแกรมคอมพิวเตอร์

2. Credits

3(2-2-5)

3. Curriculum and course category

Curriculum: Bachelor of Engineering

Course Category:

☐ General Education   ☐ Specialized Course   ☑ Professional Foundation

☐ Required Course   ☐ Elective Course   ☐ Internship

4. Teacher in charge and lecturer

Teacher in charge: Dr.Pongrapee Kaewsaiha

Lecturer: Dr.Pongrapee Kaewsaiha

5. Contact

Room Number: 4221   Email: pongrapee.ka@ssru.ac.th

6. Semester/Academic year

Semester: 1   Academic Year: 2024

Sections: 001, 002   Number of enrolled students: TBA

7. Pre-requisite (if any)

None

8. Co-requisite (if any)

None

9. Time/Venue

Wed, 08:00-12:00, 13:00-17:00, Room 4221, SSRU

10. Last date for preparing and revising this course

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Section 2 - Aims and Objectives

1. Course aims

This course aims to provide students with a foundational understanding of programming concepts, enabling them to write, analyze, and debug code effectively. By the end of the course, students will be proficient in one or more programming languages and will have developed problem-solving skills essential for tackling real-world computational challenges.

1. Course objectives

At the end of this course, students will be able to perform in the following areas of performance:

1) Fundamentals mastery: Equip students with a thorough grasp of basic programming constructs such as variables, data types, control structures, functions, and error handling.

2) Language proficiency: Ensure students gain proficiency in at least one programming language (e.g., Python, Java, C++), with the ability to extend their skills to additional languages as needed.

3) Problem-solving skills: Develop students' analytical and logical thinking abilities to design algorithms and implement solutions for a wide range of problems.

4) Application of knowledge: Provide hands-on experience through projects and assignments that apply programming concepts to real-world scenarios, reinforcing theoretical knowledge with practical skills.

5) Lifelong learning: Encourage continuous learning and adaptability, equipping students with the tools and mindset to stay current with emerging technologies and evolving programming paradigms.

2. Purposes for developing and revising course

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Section 3 - Characteristics and Operations

1. Course description

(English) Logic, flowcharts, pseudo codes, high-level languages programming, operators, conditions, iterations, variables, arrays, strings, functions, structures, pointers, reading and writing files, and implementation

(ไทย) ตรรกศาสตร์ ผังงาน รหัสคำสั่งเทียม การโปรแกรมด้วยภาษาระดับสูง ตัวดำเนินการ เงื่อนไข การทำซ้ำ ตัวแปร อาร์เรย์ สตริง ฟังก์ชัน โครงสร้าง พอยน์เตอร์ การอ่านและเขียนไฟล์ และการประยุกต์ใช้งานจริง

2. Time length per semester (Lecture/Practice/Self-study hours)

Lecture	Practice	Self-Study	Remedial Class
2 hours/week	2 hours/week	5 hours/week	As needed

3. Individual consulting and guidance

Self-consulting at the lecturer's office:

Room Number 4724A, Faculty of Industrial Technology, SSRU

Mon., 13:00-15:00 or by appointment

Consulting via office telephone/mobile phone:

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Consulting via email:

pongrapee.ka@ssru.ac.th

Consulting via social media platform:

Line OpenChat

Consulting via a web forum:

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Section 4 - Developing Students' Learning Outcomes

Expected students' learning outcomes are categorized into five domains, developed from curriculum specification (TQF2), as follows:

1. Morals and ethics

1.1 Learning outcomes to be developed

1) Have knowledge, understanding, and realizing value, morality, ethics, sacrifice, and honesty. Have academic and professional ethics.

○ 2) Be disciplined, punctual, and responsible for oneself and society. Be able to comply with organizational and social regulations.

● 3) Be able to take leader and follower roles, work as a team, resolve conflicts and priorities.

4) Be open-minded and respect rights, value, and dignity of human beings.

5) Have a conscience that considers common interests rather than personal interests.

1.2 Teaching strategies

Establish an organizational culture to instill discipline in students. Emphasis on attending classes on time as well as dressing according to university regulations. Students responsible for group work must be trained to know the responsibilities of being a group leader and being a member of a group. Be honest by not committing fraud in exams or plagiarizing other people's homework. In addition, all instructors must include morality and ethics in teaching all subjects. Also, there are activities to promote morality and ethics, such as honoring students who have done well in benefit the public and sacrifice.

1.3 Assessment & evaluation strategies

1) Evaluate from attentiveness and diligence in participating in class activities.

2) Assess students' punctuality in class, submission of work, and participation in activities.

3) Evaluate the responsibilities of assigned duties.

2. Knowledge

2.1 Learning outcomes to be developed

● 1) Have knowledge and understanding of important principles and theories in the course.

2) Have knowledge and understanding of other areas related to the course which can be integrated and applied appropriately.

○ 3) Have knowledge of operational techniques using experiential learning methods.

● 4) Be able to continuously monitor academic and professional changes both in theory and in practice.

2.2 Teaching strategies

Use a variety of teaching methods emphasizing theoretical principles and practical application in real-world environments to keep pace with technological changes. This shall be in accordance with the nature of the course as well as the content of that course.

2.3 Assessment & evaluation strategies

1) Quiz

2) Assignment

3) Mid-term and final exams

3. Cognitive skills

3.1 Learning outcomes to be developed

1) Be able to think critically and systematically.

○ 2) Be able to search, interpret, process, and evaluate data to identify, analyze, and solve problems creatively.

● 3) Be able to follow up, evaluate, and report results accurately and completely.

3.2 Teaching strategies

1) Teachers always teach and show rational thinking as an example.

2) Presentations and group discussions.

3) Provide students the opportunity to practice.

3.3 Assessment & evaluation strategies

Assess according to the real situation from the work and practice of students, such as assessing from class presentations, testing using quiz, interviews, etc.

4. Interpersonal skills and responsibilities

4.1 Learning outcomes to be developed

1) Be able to help and facilitate in solving problems in various situations in the group, either as a leader or a team member.

○ 2) Have good human relations. Be able to work well with others and adapt well to situations and corporate culture.

● 3) Have responsibility for their own actions and for group work and learning development, both personally and professionally.

4) Be able to work and take responsibility for assigned tasks efficiently.

4.2 Teaching strategies

Use instructions with activities that involve group work, work that requires coordination with others, across curriculum, across faculties, external parties, external agencies, or work that students need to research information from interviewing other people or experts.

4.3 Assessment & evaluation strategies

Assess student behavior and expression in presenting group reports in class and observe the behavior shown in participating in various activities and the completeness and clarity of the information.

5. Numerical analysis, communication, and information technology skills

5.1 Learning outcomes to be developed

● 1) Be able to use quantitative analysis to make creative decisions in interpretation and suggest ways to solve problems or disputes.

○ 2) Be able to communicate effectively both verbally and in writing. Know how to choose a presentation style that is suitable for different problems and audience groups.

3) Be able to choose appropriate information technology and communication techniques to collect data, interpretation, and information communication.

5.2 Teaching strategies

Organize learning activities in various subjects for students to analyze simulated situations, numerical analysis skills, virtual situations, and propose appropriate solutions. Learn techniques for applying technology in a variety of situations.

5.3 Assessment & evaluation strategies

Assess presentation techniques based on theory, selection of technological tools or related mathematics and statistics. Assess the ability to explain the limitations, reasons for choosing different tools, discussions, and case studies that are presented to the class.

Remark: The symbol ● means "major responsibility."

The symbol ○ means "minor responsibility."

No symbol means "no responsibility."

Section 5 - Lesson Plan and Assessment

1. Lesson plan

Week	Content	Teaching Management	Program/Teaching Strategies	Material/Media	Assessment
1	Introduction to programming	HyFlex	- Introduce course outlines. - Introduce the course LMS (Moodle) and provide technical assistance as needed. - Discuss expected outcome and grading criteria. - Introduce the overview of programming languages. - Complete activities.	- Presentation - Quiz - Discussion - Practice	- Attendance record - Activity result
2	Syntax and structure	HyFlex	- Explain variables and data types. - Learn how to display outputs and retrieve user inputs. - Provide some examples and practices. - Complete activities.	- Presentation - Quiz - Online lesson - Practice	- Attendance record - Activity result
3	Conditional statement	HyFlex	- Introduce comments and error handling. - Introduce conditional statements. - Provide some examples and practices. - Complete activities.	- Presentation - Online lesson - Practice	- Attendance record - Activity result
4	Loops	HyFlex	- Introduce loops. - Learn how to explain the program using flow charts, pseudo codes, and natural language. - Complete activities.	- Presentation - Quiz - Online lesson - Practice	- Attendance record - Activity result

Week	Content	Teaching Management	Program/Teaching Strategies	Material/Media	Assessment
5	Functions	HyFlex	- Learn basics of functions in programming. - Provide some examples and practices. - Complete activities.	- Presentation - Quiz - Practice	- Attendance record - Activity result
6	Strings	HyFlex	- Learn basics of string and string manipulation. - Provide some examples and practices. - Complete activities.	- Presentation - Online lesson - Practice	- Attendance record - Activity result
7	Review	HyFlex	- Review lessons	- Presentation - Online lesson	- Attendance record - Activity result
8	Mid-term examination				
9-10	Collections	HyFlex	- Introduce collection-type variables, such as lists, sets, and arrays. - Provide some examples and practices. - Complete activities.	- Presentation - Online lesson - Practice	- Attendance record - Activity result
11	File handling and module	HyFlex	- Learn how to integrate external files into the program. - Introduce some built-in and custom modules. - Provide some examples and practices. - Complete activities.	- Presentation - Practice	- Attendance record - Activity result
12	Regular expressions	HyFlex	- Introduce regular expressions and their uses. - Provide some examples and practices. - Complete activities.	- Presentation - Quiz - Practice	- Attendance record - Activity result

Week	Content	Teaching Management	Program/Teaching Strategies	Material/Media	Assessment
13	Object-oriented programming (OOP)	HyFlex	- Learn the basic principles of OOP. - Provide some examples and practices. - Complete activities.	- Presentation - Practice	- Attendance record - Activity result
14-15	Other programming languages	HyFlex	- Learn some other major programming languages and discuss their uses. - Discuss the relationship between different languages. - Provide some examples and practices. - Complete activities.	- Presentation - Practice - Assignment	- Attendance record - Activity result
16	Review	HyFlex	- Review lessons	- Presentation - Hand-on activity	- Attendance record - Activity result
17	Final examination				

2. Learning assessment plan

Learning Outcomes	Assessment Activities	Schedule (Week)	Proportion for Assessment (%)
1	Participation record	1-16	10
2, 3, 4, 5	Activities	1-16	40
	Examinations	8, 17	20, 30

Section 6 - Learning and Teaching Resources

1. Required textbooks and materials

Materials provided on the course page

2. Documents and important information

Documents suggested by the lecturer

3. Recommended resources for extra study

https://www.w3schools.com/

Section 7 - Course Evaluation and Revising

1. Strategies for evaluation of course effectiveness by students

Students will complete the evaluation form after the end of the course.

2. Strategies for course evaluation by the lecturer

The lecturer observes the class and collects immediate feedback from students.

3. Teaching revision

The lecturer revises the teaching and learning process based on the questionnaire results.

4. Feedback for achievement standards

The administration committees collect data and analyze students' academic performance each semester.

5. Methodology and planning for course review and improvement

Revise the curriculum, teaching methods, and learning methods by referring to the evaluation results from those involved. Meetings will be held to review the course's effectiveness and improve the curriculum.