熊本高等専門学校	開講年度	令和02年度 (2020年度)	授業科目	プログラミング通論

科目基礎情報

科目番号	CI1305	科目区分	専門 / 必修
授業形態	授業	単位の種別と単位数	履修単位: 2
開設学科	制御情報システム工学科	対象学年	3
開設期	通年	週時間数	2
教科書/教材	Head First C(David Griffiths, Dawn Griffiths, O'Reilly) / How to Think Like a Computer Scientist (Peter Wentworth, Jeffrey Elkner, Allen B. Downey, and Chris Meyers, http://openbookproject.net/thinkcs/python/english3e/)		
担当教員	嶋田 泰幸		

到達目標

This course aims that students can:
1) handle portions by calling some functions.
2) make programs which use IPC (Inter-Process Communication.
3) make programs for multiprocessing and/or multithreading.
4) make programs in Python language.

ルーブリック

	理想的な到達レベルの目安	標準的な到達レベルの目安	未到達レベルの目安
Pointers and structure	Students can write programs which utilize poiters and structure to handle data/information	Students can write simple programs which utilize pointers and structures.	Students need to study simple programs which utilise pointers and structures.
System call, MultiProcessing	Students can execute some programs using system calls, and create some processes by calling fork( ).	Students can write programs in the textbook using system calls and multiprocessing, and make simple programs which call system call or fork( ).	Students need to study how to write programs in the textbook using system calls and multiprocessing, and make simple programs which call system call or fork( ).
Inter process communication	students can write programs which communicate with other process.	Students can write sample programs of inter process communication in the textbook.	Students need to study how to write programs of inter process communication in the textbook.
Python programming	Students can make practical programs in Python	Students can make fundamental program in Python.	Students need to study how to write program in Python.

学科の到達目標項目との関係

教育方法等

概要	In the first half-term, this course provides an introduction and implementation of computer programming; C language. C language is one of the most widely used computer language in the world and it's very useful for you to lean C language. This course covers pointer, structures, memory allocation, task management and interprocess communication program. In the second-half,
授業の進め方・方法	Flipped teaching will be introduced in this subject. Learning video will be provided by uploading on Web server in advance of the class. Students have to access ther web server and watch the video for self-learning. Only students who learned by watching the video can participate in the class. During class, students have to discuss with friends/team-mates in order to solve problems that are given at the beginning of each class, and submit a report within the class.
注意点	In order to understand contents of this course, it's very important for students to make as many programs as possible. Prescribed teaching hours : 60 hours a year

授業計画

		週	授業内容	週ごとの到達目標
前期	1stQ	1週	Introduction	Students will be able to understand the basic concepts of programming in C.
		2週	Memory, Pointers and Strings(1)	Students will be able to understand similarities/differences between arrays and pointers. And, students will be able to make simple programs using pointers instead of arrays. Students will be able to know how to handle strings in C and use some built-in library functions.
		3週	Memory, Pointers and Strings(2)	Same as above.
		4週	Structures, unions and bitfields(1)	Students will be able to understand concept of structures, then will be able to use structures for handling data.
		5週	Structures, unions and bitfields(2)	Same as above.
		6週	Dynamic Memory Allocation(1)	Students will be able to know basic concept of linked list. Also, students will be able to know how to make data structure cope with flexible amounts of data by dynamically allocating memory on the heap.
		7週	Dynamic Memory Allocation(2)	Same as above.
		8週	Dynamic Memory Allocation(3)	Same as above.
	2ndQ	9週	Advanced Functions	Students will be able to write programs that utilise dynamic memory allocation.
		10週	Inter-Process Communication	Students will be able to let processes work together and communicate with each other.

		11週	Processes and System Calls(1)	Students will be able to create and control processes using system services.
		12週	Processes and System Calls(2)	Same as above.
		13週	Threads(1)	Students will be able to know how to create threads and how to use synchronisation mechanisms to protect the integrity of sensitive data.
		14週	Threads(2)	Same as above.
		15週	Evaluation & 1st term summary	
		16週		
後期	3rdQ	1週	Introduction of Python programming	Students can know what Python is, what Python can do, why we study Python.
		2週	Basic Python Programming(1)	Students will be able to understand what variables, expressions and statements.
		3週	Basic Python Programming(2)	same as abovbe
		4週	Functions and Modules(1)	Students will be able to understand how functions works and how to utilise modules in Python.
		5週	Functions and Modules(2)	same as abovbe
		6週	Conditionals(1)	Students will be able to understand conditions and how to change the program behaviour depending on the outcome of the programs.
		7週	Conditionals(2)	same as abovbe
		8週	Strings	Students will be able to understand how to handle strings in Python.
	4thQ	9週	Mitterm test	Students will be able to recap all topics they study from week 1 to week 8, and review the topics.
		10週	Lists(1)	Students will be able to understand what list is and how we use list in Python.
		11週	Lists(2)	same as abovbe
		12週	Files and Dictionaries(1)	Students will be able to understand how to handle files, what dictionaries are, how to utilise them.
		13週	Files and Dictionaries(2)	same as abovbe
		14週	Files and Dictionaries(3)	same as abovbe
		15週	Evaluation & Course summary	
		16週		

モデルコアカリキュラムの学習内容と到達目標

分類	分野	分野	学習内容	学習内容の到達目標	到達レベル	授業週
基礎的能力	工学基礎	情報リテラシー	情報リテラシー	同一の問題に対し、それを解決できる複数のアルゴリズムが存在しうることを知っている。	3	前3,前5,前8,前9,前10,前12,前14,前15,後3,後5,後7,後8,後9,後11,後13,後14,後15
				与えられた基本的な問題を解くための適切なアルゴリズムを構築することができる。	3	前3,前5,前8,前9,前10,前12,前14,前15,後3,後5,後7,後8,後9,後11,後13,後14,後15
				任意のプログラミング言語を用いて、構築したアルゴリズムを実装できる。	3	後3,後5,後7,後8,後9,後11,後13,後14,後15
分野横断的能力	汎用的技能	汎用的技能	汎用的技能	書籍、インターネット、アンケート等により必要な情報を適切に収集することができる。	3	
				収集した情報の取捨選択・整理・分類などにより、活用すべき情報を選択できる。	3	
				収集した情報源や引用元などの信頼性・正確性に配慮する必要があることを知っている。	3	
				課題の解決は直感や常識にとらわれず、論理的な手順で考えなければならないことを知っている。	3	

評価割合

	Midterm test	Regular examination	Report and Quiz	合計
総合評価割合	20	40	40	100
基礎的能力	0	0	0	0
専門的能力	20	40	40	100
分野横断的能力	0	0	0	0