

熊本高等専門学校		開講年度	平成28年度 (2016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	0004		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)				
担当教員	嶋田 泰幸				
到達目標					
This course aims that students can: 1) allocate portions of memory resources by calling some functions. 2) declare and use structures. 3) make programs which use system services (system call) and IPC (Inter-Process Communication) 4) make programs for multiprocessing and/or multithreading.					
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	Make programs which utilize pointers to handle data/information		Understand similarities/differences between array and pointer, and write/execute programs in the textbook.		Cannot understand programs in the textbook.
Structure	Make programs which utilize structures to handle data/information		Understand programs in the textbook using structures and make simple programs which utilize structures.		Cannot understand programs in the textbook.
System call, MultiProcessing	Execute some programs using system calls, and Create some processes by calling fork().		Understand programs in the textbook using system calls and multiprocessing, and make simple programs which call system call or fork().		Cannot understand programs in the textbook.
学科の到達目標項目との関係					
本科（準学士課程）での学習・教育到達目標 2-1 本科（準学士課程）での学習・教育到達目標 3-3					
教育方法等					
概要	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 learn C language. This course covers pointer, structures, memory allocation, task management and interprocess communication program.				
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 their 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. 試験 consists of 2 parts; paper examinations and practical examinations.				
授業計画					
		週	授業内容	週ごとの到達目標	
前期	1stQ	1週	Memory and Pointers(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.	
		2週	Memory and Pointers(2)	Same as above.	
		3週	Strings(1)	Students will be able to know how to handle strings in C and use some built-in library functions.	
		4週	Strings(2)	Same as above.	
		5週	Structures, Unions and Bitfields(1)	Students will be able to write programs which combine the basic data types into structures.	
		6週	Structures, Unions and Bitfields(2)	Same as above.	
		7週	Structures, Unions and Bitfields(3)	Same as above.	
		8週	Mid-term test	The aim of this mid-term test is to assessing students' understandings.	
	2ndQ	9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.	
		10週	Dynamic Memory Allocation(2)	Same as above.	
		11週	File Input/Output(1)	Students will be able to save/fetch data into/from a file instead of standard stream.	
		12週	File Input/Output(2)	Same as above.	
		13週	Advanced Functions(1)	Students will be able to write programs that utilize pointers to functions.	
		14週	Advanced Functions(2)	Same as above.	

後期		15週	Comprehensive lab	Students will be able to write some program using several technics which is taught in the first semester.
		16週		
	3rdQ	1週	Static and Dynamic Libraries(1)	Students will be able to make own libraries and reuse the same code across several programs.
		2週	Static and Dynamic Libraries(2)	Same as above.
		3週	Processes and System Calls(1)	Students will be able to create and control processes using system services.
		4週	Processes and System Calls(2)	Same as above.
		5週	Processes and System Calls(3)	Same as above.
		6週	Inter-Process Communication(1)	Students will be able to let processes work together and communicate with each other.
		7週	Inter-Process Communication(2)	Same as above.
		8週	Mid-term test	The aim of this mid-term test is to assessing students' understandings.
	4thQ	9週	Inter-Process Communication(3)	Students will be able to let processes work together and communicate with each other.
		10週	Socket and Networking(1)	Students will be able to create programs that behave as servers and programs that behave as clients.
		11週	Socket and Networking(2)	Same as above.
		12週	Socket and Networking(3)	Same as above.
		13週	Threads(1)	Students will be able to know how to create threads and how to use synchronization mechanisms to protect the integrity of sensitive data.
		14週	Threads(2)	Same as above.
		15週	Comprehensive lab	Students will be able to write some program using several technics which is taught in the first semester.
		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	学習内容	学習内容の到達目標	到達レベル	授業週
専門的能力	分野別の専門工学	情報系分野	プログラミング	変数とデータ型の概念を説明できる。	3	前1,前2,前3,前4,前5,前6,前7,前8,前15,後8,後15
				プロシージャ(または、関数、サブルーチンなど)の概念を理解し、これらを含むプログラムを記述できる。	3	前8,前9,前10,前13,前14,前15,後1,後2,後3,後4,後5,後6,後8,後9,後10,後11,後12,後13,後14,後15
				与えられた問題に対して、それを解決するためのソースプログラムを記述できる。	3	前1,前2,前3,前4,前8,前9,前10,前11,前12,前13,前14,前15,後1,後2,後3,後4,後5,後6,後8,後9,後10,後11,後12,後13,後14,後15
				ソフトウェア生成に必要なツールを使い、ソースプログラムをロードモジュールに変換して実行できる。	3	前1,前2,前3,前4,前8,前9,前10,前11,前12,前13,前14,前15,後1,後2,後3,後4,後5,後6,後8,後9,後10,後11,後12,後13,後14,後15

				ソフトウェア開発に利用する標準的なツールの種類と機能を説明できる。	2	前8,前9,前10,前11,前12,前13,前14,前15,後3,後4,後5,後6,後8,後9,後10,後11,後12,後13,後14,後15
				要求仕様に従って、標準的な手法により実行効率を考慮したプログラムを設計できる。	2	前9,前13,前14,前15,後3,後4,後5,後6,後8,後9,後10,後11,後12,後13,後14,後15
			計算機工学	整数・小数を2進数、10進数、16進数で表現できる。	3	前5,前6,前7,前8,前11,前12,前15,後8,後15
				整数・小数をコンピュータのメモリ上でデジタル表現する方法を説明できる。	3	前5,前6,前7,前8,前11,前12,前15,後8,後15
			情報通信ネットワーク	ローカルエリアネットワークの概念を説明できる。	1	後3,後4,後5,後6,後8,後9,後10,後11,後12,後13,後14,後15
	分野別の工学実験・実習能力	情報系分野【実験・実習能力】	情報系【実験・実習】	与えられた問題に対してそれを解決するためのソースプログラムを、標準的な開発ツールや開発環境を利用して記述できる。	3	前1,前2,前3,前4,前5,前6,前7,前8,前9,前10,前11,前12,前13,前14,前15,後1,後2,後3,後4,後5,後6,後8,後9,後10,後11,後12,後13,後14,後15
				ソフトウェア生成に利用される標準的なツールや環境を使い、ソースプログラムをロードモジュールに変換して実行できる。	3	前1,前2,前3,前4,前5,前6,前7,前8,前9,前10,前11,前12,前13,前14,前15,後1,後2,後3,後4,後5,後6,後8,後9,後10,後11,後12,後13,後14,後15
				ソフトウェア開発の現場において標準的とされるツールを使い、生成したロードモジュールの動作を確認できる。	3	前1,前2,前3,前4,前5,前6,前7,前8,前9,前10,前11,前12,前13,前14,前15,後1,後2,後3,後4,後5,後6,後8,後9,後10,後11,後12,後13,後14,後15

評価割合

	試験	発表	相互評価	態度	ポートフォリオ	その他	合計
総合評価割合	70	0	0	0	0	30	100
基礎的能力	0	0	0	0	0	0	0
専門的能力	70	0	0	0	0	30	100
分野横断的能力	0	0	0	0	0	0	0