Programming & Problem Solving
CSE 122

Course Rationale

Regardless of the area of study, computer science is all about solving problems with computers. The problems that we want to solve can come from any real-world problem or perhaps even from the abstract world.Computer programming is at the heart of computer science. It is the implementation portion of software development, application development and software engineering efforts, transforming ideas and theories into actual, working solutions.

1.1.Course Objective

The primary purpose of this course is to teach students the basic of pure programming and problem solving. This course provides students with a comprehensive study of the C programming language.The course emphasizes problem-solving and empirical skills through the process of designing,implementing, and executing C programs.

1.2.Course Outcomes (CO's)

CO1	Able to solve computing problems using programming concepts and learn the basic concept of ACM Problem solving techniques.
CO2	Able to apply fundamental programming elements including: variable, use of datatypes and data structures, decision structures, loop structures, pointer, string, console,file IO, and functions.
CO3	Able tospecify the problem requirements, analyze the problem, design the algorithm to solve the problem and implementwith the help of programming language.
CO4	Able to apply the knowledge of programing and problem solving in real file problem.

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1.3.CO-PO Mapping [attainment level used for COs from 1(weak)-3(strong) correlation]

PO's / CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2											
CO2	3	2										
CO3				3								
CO4	3	3		2								1

1.4.CO Assessment Scheme

Assessment Task	**CO's**				**Mark (Total=100)**
	CO1	**CO2**	**CO3**	**CO4**	
Attendance	--	--	--	--	7
Class Test	--	--	--	--	15
Assignment	--	--	--	--	5
Presentation	--	--	--	--	8
Midterm Examination	10	10	5	--	25
Semester Final Examination	10	10	10	10	40
				Total Mark	100

2. Strategies and approaches to learning

2.1. Teaching and Learning Activities (TLA)

TLA1	Lectures twice a week using multimedia of different topics.
TLA2	Active discussion in class regarding efficient solving of the logical and mathematical problems.
TLA3	Group discussion and presentation regarding diverse problems and corresponding lectures.
TLA4	Evaluation of class performances to reach each student in a class for every topic.

3. Course Schedule and Structure

3.1.Textbook

1. Programming in ANSI C- E Balagurusamy.
2. The C programming language. Prentice Hall, 1988, by Dennis Ritchie
3. Teach Yourself C : Herbert Shieldt

3.2.Reference Books

1. Programming in C by Stephen G. Kochan
2. Let Us C , 7/e by YashavantKanetkar.
3. Programming in ANSI C : BalaguruSamy
4. C: The Complete Reference : Herbert Shieldt
5. How to solve it using Computer: R.G. Dromey, Prentice Hall, 1985
6. C Programming- A Modern Approach, 2nd Edition, W W Norton, 2008
7. C: How to Program, 6/E Paul Deitel Harvey M. Deitel, Deitel& Associates, Inc

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WEEK	Lesson	Topic	Textbook or video References	Related CO's	Related Problems to discuss
1	1	- Introduction - Course Logistics	- কম্পিউটার বিজ্ঞান কেন পড়বো? - কেন আমি প্রোগ্রামিং শিখবো?		
	2	- Your first Program o Braces o Output o Input o Format specifiers o Alignment o Period	- **E-Balagurusamy(Ch1)** - https://www.geeksforgeeks.org/format-specifiers-in-c/		
2	3	- Variables and Data types - Variable Naming and Reserved words - Keywords - Identifier naming rules	- **E-Balagurusamy(Ch2)** - https://www.learncpp.com/cpp-tutorial/keywords-and-naming-identifiers/		
	Quiz 1				
	4	- Token, Operators, Expressions - Expression Evaluation o Associativity - Type casting o Implicit o Explicit	- **E-Balagurusamy(Ch3)** - **E-Balagurusamy(Ch4)** - https://www.geeksforgeeks.org/cc-tokens/ - https://www.sitesbay.com/cprogramming/c-expression-evaluation - https://developerinsider.co/type-casting-c-programming/		

3	5	- Conditional Statements o if / else o Code blocks	- **E-Balagurusamy(Ch5)** - https://www.guru99.com/c-if-else-statement.html		
	6	- Nested if / else - if / else if / else	- **E-Balagurusamy(Ch5)**		
4	7	- Switch Case	- **E-Balagurusamy(Ch4)** - https://www.guru99.com/c-switch-case-statement.html		
	Quiz 2				
	8	- Loops o For loop	- https://www.guru99.com/c-loop-statement.html		
5	9	- For loop revisited - While loop - Do-while loop	- **E-Balagurusamy(Ch6)**		
	10	- Nested loops - Infinite loops	- **E-Balagurusamy(Ch6)**		
6	11	- Break - Continue	- **E-Balagurusamy(Ch6)** - http://www.trytoprogram.com/c-programming/c-programming-break-continue-statements/		
	12	- Array	- **E-Balagurusamy(Ch7)** - https://www.programiz.com/c-programming/c-arrays		
MID Term Exam (7th Week)					

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8	13	- Array revisited - Multi-dimensional Array	- **E-Balagurusamy(Ch7)** - https://www.programiz.com/c-programming/c-multi-dimensional-arrays		
	Quiz 3				
	14	- Stings - String I/O - String manipulations with Library	- **E-Balagurusamy(Ch8)** - https://beginnersbook.com/2014/01/c-strings-string-functions/		
9	15	- String manipulations	- **E-Balagurusamy(Ch8)** - https://www.w3schools.in/cplusplus-tutorial/manipulating-strings/		
	Quiz 4				
	16	- Function - Function prototype - Formal and actual parameters - Parameter passing	- **E-Balagurusamy(Ch9)** - https://www.programiz.com/c-programming/c-user-defined-functions		
10	17	- Variable scope	- https://www.geeksforgeeks.org/scope-rules-in-c/		
	18	- Recursion	- **E-Balagurusamy(Ch9)** - https://www.geeksforgeeks.org/recursion/		
11	19	- Recursion revisited	- **E-Balagurusamy(Ch9)**		

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	Quiz 5				
	20	- Custom Data Type - Structure - Union	- **E-Balagurusamy(Ch13)** - https://www.go4expert.com/articles/custom-data-types-c-struct-union-typedef-t29956/		
12	21	- Pointers - Pointer arithmetic - Dynamic Memory Allocation	- **E-Balagurusamy(Ch11)** - https://www.tutorialspoint.com/cprogramming/c_pointers.htm		
	22	- Call by Value - Call by Reference - Pointers and Strings - File I/O	- **E-Balagurusamy(Ch11)** - https://www.tutorialspoint.com/cprogramming/c_function_call_by_reference.htm		
	Quiz 6				
13	23	Review Class	N/A	N/A	Discussion dependent
	24	Review Class	N/A	N/A	Discussion dependent
Final Exam (14th Week)					