East West University
Department of Computer Science and Engineering
Course Outline

Course Information

Course: CSE105 Structured Programming (Sections: 9)

Teaching Scheme:

	Theory	Laboratory	Total
Credits	3	1	4
Contact Hours	3 Hours/Week for 13 Weeks	2 Hours/Week for 13 Weeks	5 Hours/Week for 13 Weeks

Prerequisite: NONE

Instructor Information

Instructor: Md. Shamsujjoha
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TA: Ariful Islam Ron, Nabila Bilkis Shova

Class Routine and Office Hour

Day	11.50-01.20	01.30-03.00	03.10-04.40	04.50-06.50
Sunday	CSE 245 (1) Room: 357	Office Hour	CSE 101 (2) Room: 530	Office Hour
Monday	CSE 245 (2) Room: 217	Office Hour	CSE 105 (9) Room: 359	Office Hour
Tuesday	CSE 245 (1) Room: 357	Office Hour	Office Hour	CSE 105 (9) Lab Room: 533
Wednesday	CSE 245 (2) Room: 217	Office Hour	CSE 105 (9) Room: 359	CSE 245 (1) Lab Room: 637
Thursday		Office Hour	CSE 101 (2) Room: 534	CSE 245 (2) Lab Room: 637

Course Objective

This is the first course in the computer science programming sequence and is required of all computer science and engineering major with no prior programming experience. The purpose of this course is to introduce to students to the field of programming using C language. The students will be able to enhance their analyzing and problem-solving skills and use the same for writing programs in C. Knowledge of this course will be needed as prerequisite knowledge for future courses such as CSE107 Object Oriented Programming, CSE205 Discrete Mathematics, CSE207 Data Structures, CSE245 Algorithms, CSE301 Database Systems, CSE345 Digital Logic Design, CSE365 Artificial Intelligence, CSE405 Computer Networks and many others.

Course Outcomes (COs)

After completion of this course students will have:

CO1	Ability to understand the fundamentals of programming and basic structure of C programming language.
CO2	Ability to choose the appropriate decision making and control statements, and arrays to solve computational problems.
CO3	Ability to use functions to solve computational problems in a modular and hierarchical style.
CO4	Ability to use pointers, structures, unions, user defined data types, dynamic memory and file to develop programs for solving moderately complex computational problems.

Mapping of Course Outcomes (COs) to Program Outcomes (POs)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												X
CO2		X	X									X
CO3		X	X									X
CO4	X	X	X		X					X		X

Program Outcomes (POs)

PO1	**Computer Science and Engineering Knowledge:** Apply knowledge of mathematics, natural sciences, algorithm, and hardware design to the solution of complex problems of different areas of Computer Science and Engineering such as Software Systems, Information Systems, Intelligent Systems, Hardware Systems, and Networking Systems.
PO2	**Problem Analysis:** Identify, formulate, research literature, and analyse complex Computer Science and Engineering problems reaching substantiated conclusions using principles of mathematics, natural sciences, algorithm, and hardware design.
PO3	**Design/Development of Solutions:** Design solutions for complex Computer Science and Engineering problems and design systems, components, or processes that meet specified needs with appropriate consideration for realistic constraints.
PO4	**Investigation:** Conduct investigation into complex Computer Science and Engineering problems using research based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PO5	**Modern Tool Usage:** Create, select and apply appropriate techniques, resources, and modern Software Engineering, Hardware Engineering, and Information Technology tools to complex Computer Science and Engineering activities, with an understanding of the limitations.
PO6	**Computer and Society:** Apply reasoning informed by contextual knowledge to assess societal, legal and cultural issues and the consequent responsibilities relevant to professional Computer Science and Engineering practice.
PO7	**Contemporary Issues and Sustainability:** Understand the impact of professional Computer Science and Engineering solutions in societal and contemporary contexts and demonstrate knowledge of and need for sustainable development.
PO8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of computing practice.
PO9	**Individual Work and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.
PO10	**Communication:** Communicate effectively on complex Computer Science and Engineering activities with the computing community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project Management:** Demonstrate knowledge and understanding of Computer Science and Engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-Long Learning** Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Mapping of Course Outcomes (COs) to Knowledge Profile

CO	K1	K2	K3	K4	K5	K6	K7	K8
CO1	X							
CO2	X	X						
CO3	X	X						
CO4	X	X	X					

Knowledge Profile

	Attribute
K1	A systematic, theory-based understanding of the natural sciences applicable to Computer Science and Engineering.
K2	Conceptually-based mathematics, numerical analysis, statistics and formal aspects of computer and information science to support analysis and modelling applicable to Computer Science and Engineering.
K3	A systematic, theory-based formulation of engineering fundamentals required in Computer Science and Engineering.
K4	Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in Computer Science and Engineering; much is at the forefront of Computer Science and Engineering.

K5	Knowledge that supports engineering design in a practice area of Computer Science and Engineering.
K6	Knowledge of engineering practice (technology) in the practice areas in the Computer Science and Engineering.
K7	Comprehension of the role of engineering in society and identified issues in engineering practice in Computer Science and Engineering: ethics and the professional responsibility of an engineer to public safety; the impacts of engineering activity: economic, social, cultural, environmental and sustainability.
K8	Engagement with selected knowledge in the research literature of Computer Science and Engineering.

Complex Problem Solving

CO	PO	Attributes
CO2	PO2, PO3	Range of conflicting requirements
CO3	PO2, PO3	Range of conflicting requirements
CO4	PO1, PO2, PO3	Range of conflicting requirements, Depth of analysis required, Depth of knowledge required, Extent of applicable codes, and Interdependence

Range of Complex Problem Solving:

Attribute	**Complex Problems**
Range of conflicting requirements	Involve wide-ranging or conflicting technical, engineering and other issues
Depth of analysis required	Have no obvious solution and require abstract thinking and originality in analysis to formulate suitable models.
Depth of knowledge required	Requires research-based knowledge, much of which is at, or informed by, the forefront of Computer Science and Engineering and that allows a fundamental-based, first-principles analytical approach.
Familiarity of issues	Involve infrequently encountered issues.
Extent of applicable codes	Are outside problems encompassed by standards and codes of practice for professional Computer Science and Engineering.
Extent of stakeholder involvement and level of conflicting requirements	Involve diverse groups of stakeholders with widely varying needs.
Consequences	Have significant consequences in a range of contexts.
Interdependence	Are high-level problems that include many component parts or sub-problems.

Complex Engineering Activities

CO	PO	Attributes
CO4	PO5, PO10	Range of resources, Level of interaction, Innovation, and Familiarity

Complex Engineering Activities

Attribute	Complex Problems
Range of resources	Involve the use of diverse resources (for this purpose, resources include people, money, equipment, materials, information and technologies)
Level of interaction	Require resolution of significant problems arising from interactions between wide-ranging or conflicting technical, engineering or other issues
Innovation	Involve creative use of Computer Science and Engineering principles and research-based knowledge in novel ways
Consequences to society and the environment	Have significant consequences in a range of contexts, characterized by difficulty of prediction and mitigation
Familiarity	Outside problems encompassed by standards and codes of practice for professional Computer Science and Engineering

Course Topics, Teaching-Learning Method, and Assessment Scheme

Course Topic	Teaching-Learning Method	CO	Mark of Cognitive Learning Levels				Mark of COs	Exam (Mark)
			C1	C2	C3	C4		
Introduction to computers and programming languages,data representation in computer. flowchart for problem solving,	Lecture, Class Discussion, Discussion Outside Class with Instructor/ Teaching Assistant	CO1	2.5				2.5	Midterm Exam I (15)
Introduction to C Programming (input, output, variables, data type, operators, expressions, assignments)	Do	CO1		2.5			2.5	
Conditional ControlStatements(if, if-else,if..else-if, nested if, switch)	Do	CO2		2.5	2.5		5	
Repeating Statement (while, for and do…while), break and continue statements	Do	CO2		2.5	2.5		5	
Introduction to Arrays (Arrays, Declaring Arrays, Manipulating the Arrays)	Do	CO2	2.5		2.5		5	Midterm Exam II (15)
Nested Repeating Statement	Do	CO2		2.5	2.5		5	
Multidimensional Array	Do	CO2	2.5		2.5		5	

Characters and Strings (String search, compare, etc.)	Do	CO2	2.5		2.5		5	Final Exam (20)
Introduction to Functions (Function Definitions, Function Prototypes and Argument, Header Files). Solving complex problem in modular fashion using user defined function	Do	CO3			2.5		2.5	
Introduction to recursive definition and solving problem using recursive function	Do	CO3		2.5			2.5	
Pointers (Pointer variable declarations, pointer operators, passing arguments to functions by reference with pointers, pointer expressions and pointer arithmetic, arrays of pointers, and function pointers)	Do	CO4			2.5		2.5	
Structures (Structure Definitions and Initialization, Accessing Structure Members, Structure with Function and Pointer)	Do	CO4	2.5				2.5	
File Management (Files and Streams, creating a File, Reading Data from File, writing data to File, and Updating Files)	Do	CO4			2.5		2.5	
Dynamic Memory Allocation, and Linked Lists	Do	CO4		2.5			2.5	

Laboratory Experiments/Project, Teaching-Learning Method, and Assessment Scheme:

Experiment	**Teaching-Learning Method**	**CO**	**Mark of Psychomotor Learning Levels**				**CO Mark**
			P2	P3	P4	P5	
Solving problem using basic arithmetic operator	Preparing flow chart, Preparing Post-Lab Report	CO1	0.5		0.5		1
Solving problem using conditional statement	Do	CO2	0.5		0.5		1
Solving problem using loop	Do	CO2	0.5		0.5		1
Solving problem which required array manipulation	Do	CO2	0.5		0.5		1
Solving problem which required nested loop	Do	CO2	0.5		0.5		1

Lab Exam	Individual Lab Exam	CO1 CO2	2		2		4
Solving problem which required multi-dimensional array	Preparing flow chart, Preparing Post-Lab Report	CO2	0.5		0.5		1
Solving problem which required string manipulation	Do	CO2	0.5		0.5		1
Solving problem using user defined function	Do	CO3	0.5		0.5		1
Solving problem which take input from a file and write result into another file	Do	CO4	0.5		0.5		1
Solving problem which required user defined data type e.g. structure and/or union	Do	CO4	0.5		0.5		1
Lab Exam	Individual Lab Exam	CO2 CO3 CO4	2		2		4
Project	Team-based Project with report writing, presentation and/or viva-voce	CO2 CO3 CO4		2	2	3	7
Total			**9**	**2**	**11**	**3**	**25**

Learning Taxonomy:
Cognitive Domain

Level	Category	Meaning	Keywords
C1	Knowledge	Ability to observe and remember previously learned information; knowledge of specific facts, terms, concepts, principles, ideas, events, places etc.; mastery of subject material.	Arrange, Underline, Label, Name, Identity, Enumerate, List, State, Indicate, Select, Define, Read, Describe, Record.
C2	Comprehension	Ability to understand information and grasp material; translating knowledge from one form to another; interpreting, comparing and contrasting material; predicting consequences and future trends.	Infer, Review, Explain, Report, Rewrite, Estimate, Distinguish, Describe, Trace, Identity, Classify, Indicate, Discuss, Recognize, Translate, Give examples, Defend, Summarize, Paraphrase.
C3	Application	Ability to use information, learned material, methods, concepts, theories, principles, laws and theories in new situations; problem solving using required knowledge or skills.	Change, Apply, Manipulate, Teach, Illustrate, Use, Report, Determine, Solve, Construct, Write, Interpret, Organize, Provide, Employ, Investigate, Translate.

C4	Analysis	Ability to break down material and recognition of organization structure; identification of components and relationships between components; recognitions of patterns and hidden meanings.	Analyze, Solve, Test, Debate, Compare, Contrast, Diagram, Determine, Criticize, Prioritize, Categorize, Experiment, Sub-divide, Calculate, Questions, Illustrate, Appraise, Relate, Examine.
C5	Synthesis	Ability to combine parts or apply prior skills and knowledge to produce a new whole; integrate ideas into a solution; generalize from given facts; propose a plan of action; formulate new classification methods.	Assemble, Combine, Propose, Set Up, Compile, Devise, Compose, Adapt, Explain, Manage, Intervene, Arrange, Categorize, Reorganize, Structure, Validate, Substitute, Generate, Integrate, Express, Perform, Plan, Prepare, Negotiate, Model.
C6	Evaluation	Ability to judge and assess the value of theories and presentation, based on their value, logic or adequacy, for a given purpose; compare and make choices based on reasoned argument; verify the value of argument; verify the value of evidence; recognize subjectivity.	Enumerate, Interpret, Predict, Attach, Reframe, Choose, Evaluate, Estimate, Conclude, Revise, Judge, Support, Compare, Measure, Critique, Decide, Defend, Rate, Grade, Criticize, Appraise, Contrast, Justify, Assess, Score, Argue.

Psychomotor Domain

Level	**Category**	**Meaning**	**Keywords**
P1	Imitation	Copy action of another; observe and replicate.	Relate, Repeat, Choose, Copy, Follow, Show, Identify, Isolate.
P2	Manipulation	Reproduce activity from instruction or memory	Copy, response, trace, Show, Start, Perform, Execute, Recreate.
P3	Precision	Execute skills reliably; independent of help.	Assemble, Implement, Organize, Calibrate, Demonstrate, Build, Perfect, Control, Complete, Measure.
P4	Articulation	Adapt and integrate expertise to satisfy a non-standard objective.	Modify, Master, Develop, Adapat, Formulate, Coordinate, Combine, Solve, Integrate.
P5	Naturalization	Automated, unconscious mastery of activity and related skills at strategic level.	Design, Rank, Manage, Compose, Develop, Specify, Construct, Invent.

Overall Assessment Scheme

	CO				Assessment Area Mark
Assessment Area	**CO1**	**CO2**	**CO3**	**CO4**	
Class Participation	1.25	1.25	1.25	1.25	5
Class Test/Quiz	2.5	2.5	2.5	2.5	10
Midterm Exam - I	5	10			15
Midterm Exam -II		15			15
Final Exam		5	5	10	20
Assignment with report and presentation	2.5	2.5	2.5	2.5	10
Laboratory Experiments, Exam, and Lab Project	2	12	5	6	25
Total Mark	**13.25**	**48.25**	**16.25**	**22.25**	**100**

Student Learning Time (SLT)

Activity	**Hours**
Theory	
Contact Hours (3 Hours/Week × 13 Weeks)	39.0
Final Examination on 14th Week	1.5
Review Lessons and Preparation for Class Tests/Quizzes (3 Hours/Week × 13 Weeks)	39.0
Preparation for Exams (Midterm Exam I=10, Midterm ExamII=10, Final Exam=10.5)	30.5
Carryout Assignment	10.0
Subtotal	**120.0**
Laboratory	
Lab Works (2 Hours/Lab Work×10Lab Work)	20.0
Lab Examination	4.0
Preparation for Lab Work (0.5 Hour/Lab Work×10Lab Work)	5.0
Lab Project including Report and Presentation	11.0
Subtotal	**40.0**
Total	160.0

Teaching Materials/Equipment

Text book: Paul Deitel, Harvey Deitel, *C: How to Program*, Prentice Hall, 6th Edition.

Reference book:
Herbert Schildt, *Teach Yourself C*, Osborne, latest Edition
E. Balagurusamy, *Programming in ANSI C*, Tata McGraw-Hill, latest Edition

Lab Manual: Lab manual will be provided.

Project Description: Project description will be provided.

Equipment/Software: Any C/C++ IDE: As example, Visual C++, Code::Block, or Dev-C++

Grading System

Marks (%)	Letter Grade	Grade Point	Marks (%)	Letter Grade	Grade Point
97-100	A+	4.00	73-76	C+	2.30
90-96	A	4.00	70-72	C	2.00
87-89	A-	3.70	67-69	C-	1.70
83-86	B+	3.30	63-66	D+	1.30
80-82	B	3.00	60-62	D	1.00
77-79	B-	2.70	Below 60	F	0.00

Exam Dates

Exam Name	Section 2	Notes
Mid Term 1	Wednesday 18 October 2017	Monday, 16 October 2017 is earmarked for Mid Term I Exams for students who will have more than two exams on a single day as per the schedule above.
Mid Term 2	Wednesday 15 November 2017	Monday, 13 November 2017 is earmarked for Mid Term II Exams for students who will have more than two exams on a single day as per the schedule above.
Final	Wednesday 13 December 2017	Monday, 11 December 2017 is earmarked for Final Exams for students who will have more than two exams on a single day as per the schedule above.

Academic Code of Conduct

Academic Integrity:
Any form of cheating, plagiarism, personification, falsification of a document as well as any other form of dishonest behavior related to obtaining academic gain or the avoidance of evaluative exercises committed by a student is an academic offence under the Academic Code of Conduct and **may lead to severe penalties as decided by the Disciplinary Committee of the university.**

Special Instructions:

- Students are expected to attend all classes and examinations. A student MUST have at least 80% class attendance to sit for the final exam.
- Students will not be allowed to enter into the classroom after 20 minutes of the starting time.
- For plagiarism, the grade will automatically become zero for that exam/assignment.

- Normally there will be **NO make-up exam**. However, in case of **severe illness, death of any family member, any family emergency, or any humanitarian ground**, if a student miss any exam, the student MUST get approval of makeup exam by written application to the Chairperson through the Course Instructor **within 48 hours** of the exam time. Proper supporting documents in favor of the reason of missing the exam have to be presented with the application.

- For **final exam**, there will be NO makeup exam. However, in case of **severe illness, death of any family member, any family emergency, or any humanitarian ground**, if a student misses the final exam, the student MUST get approval of **Incomplete Grade** by written application to the Chairperson through the Course Instructor **within 48 hours** of the final exam time. Proper supporting documents in favor of the reason of missing the final exam have to be presented with the application. **It is the responsibility of the student to arrange an Incomplete Exam within the deadline mentioned in the Academic Calendar in consultation with the Course Instructor**.

- All mobile phones MUST be turned to silent mode during class and exam period.

- There is **zero tolerance for cheating** in exam. Students caught with cheat sheets in their possession, whether used or not; writing on the palm of hand, back of calculators, chairs or nearby walls; copying from cheat sheets or other cheat sources; copying from other examinee, etc. would be treated as cheating in the exam hall. The only penalty for cheating is **expulsion for several semesters as decided by the Disciplinary Committee of the university**.