UPES
UNIVERSITY WITH A PURPOSE

Year : 2021-22
Semester : II

Name of Faculty : Amit Verma
1. Course : Principles of Programming Languages
2. Program : B.Tech. CSE
3. Target : 45%

Course Code: CSEG 1010
L: 4
T: 0
P: 0
C: 4

COURSE PLAN

Target	45% (marks)
Level-1	35% (population)
Level-2	45% (population)
Level-3	55% (population)

1. Method of Evaluation

UG ✔	PG
Quizzes/Tests, Assignments (30%)	Quizzes/Tests, Assignments, seminar (50%)
Mid Examination (20%)	End semester (50%)
End examination (50%)	

2. Passing Criteria

Scale	PG	UG ✔
Out of 10 point scale	SGPA – "6.00" in each semester CGPA – "6.00" Min. Individual Course Grade – "C" Course Grade Point – "4.0"	SGPA – "5.0" in each semester CGPA – "5.0" Min. Individual Course Grade – "C" Course Grade Point – "4.0"

*for PG, passing marks are 40/100 in a paper
*for UG, passing marks are 35/100 in a paper

3. Pedagogy

- Presentations
- Flipped Classroom sessions
- Think-Pair-Share Activities
- Video Lectures

4. References:

Text Books	Web resources	Reference books
1. Robert W. Sebesta, "Concepts of Programming Languages", 10th Ed., Pearson.	Blackboard	1. "Programming Languages: Design and Implementations", Terrance W.Pratt, Marvin V. Zelkowitz, T.V.Gopal, Fourth ed., Prentice Hall. 2. "Programming Language Design Concept", David A. Watt, Willey India. 3. "Programming languages: Concepts and Constucts", Ravi Sethi, Second Ed., Pearson. 4. "Types and programming Languages", Benjamin C. Pierce. The MIT Press Cambridge, Massachusetts, London, England

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GUIDELINES TO STUDY THE SUBJECT

Instructions to Students:

1. Go through the 'Syllabus' in the Black Board section of the web-site(https://learn.upes.ac.in) in order to find out the Reading List.
2. Get your schedule and try to pace your studies as close to the timeline as possible.
3. Get your on-line lecture notes (Content, videos) at Lecture Notes section. These are our lecture notes. Make sure you use them during this course.
4. Check your blackboard regularly
5. Go through study material
6. Check mails and announcements on blackboard
7. Keep updated with the posts, assignments and examinations which shall be conducted on the blackboard
8. Be regular, so that you do not suffer in any way
9. **Cell Phones and other Electronic Communication Devices:** Cell phones and other electronic communication devices (such as Blackberries/Laptops) are not permitted in classes during Tests or the Mid/Final Examination. Such devices MUST be turned off in the class room.
10. **E-Mail and online learning tool:** Each student in the class should have an e-mail id and a pass word to access the LMS system regularly. Regularly, important information – Date of conducting class tests, guest lectures, via online learning tool. The best way to arrange meetings with us or ask specific questions is by email and prior appointment. All the assignments preferably should be uploaded on online learning tool. Various research papers/reference material will be mailed/uploaded on online learning platform time to time.
11. **Attendance:** Students are required to have minimum attendance of 75% in each subject. Students with less than said percentage shall NOT be allowed to appear in the end semester examination.

This much should be enough to get you organized and on your way to having a great semester! If you need us for anything, send your feedback through e-mail to your concerned faculty. Please use an appropriate subject line to indicate your message details.

There will no doubt be many more activities in the coming weeks. So, to keep up to date with all the latest developments, please keep visiting this website regularly.

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RELATED OUTCOMES

1. The expected outcomes of the Program are:

PO1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Individual and team-work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	Communication: Communicate effectively on complex engineering activities with the engineering 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 and finance: Demonstrate knowledge and understanding of the 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: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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2. The expected outcomes of the Specific Program are:

PSO1	Perform system and application programming using computer system concepts, concepts of Data Structures, algorithm development, problem solving and optimizing techniques.
PSO2	Apply software development and project management methodologies using concepts of front-end and back-end development and emerging technologies and platforms.
PSO3	-

3. The expected outcomes of the Course are:

CO1	Relate programming on the basis of syntax and semantics.
CO2	Practice various types and constructs that are common to every programming language.
CO3	Plan subprograms with an understanding of their internal implementations.
CO4	Classify problems on the basis of object orientation, Concurrency, functional programming and Logic programming.

4. CO-PO/PSO Relationship Matrix

1- Slight (low) 2- Moderate (Medium) 3-Substantial (high)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1		1	2									3		-
CO2	1	2	1	2									3		-
CO3	1	2	3	2									3		-
CO4	1	2	1	2	1							2	1	1	-
Average	1	1.5	1.5	2	0.25	0	0	0	0	0	0	0.5	2.5	0.25	-

5. Course Outcomes assessment plan:

Components / Course Outcomes	Assignment 1	Assignment 2	Quiz 1	Quiz 2	Quiz 3	Quiz 4	Quiz 5	Mid Semester	End Semester
CO1	✔		✔					✔	✔
CO2	✔			✔				✔	✔
CO3		✔			✔		✔		✔
CO4		✔				✔	✔		✔

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BROAD PLAN OF COURSE COVERAGE

Course Activities:

S.No.	Description	Planned			Remarks
		From	To	No. of Sessions	
1	Overview of Computer organization and Programming fundamentals			12	CO1
2	Data Types, Operators and Expressions			10	CO2
3	Functions and its aspects			8	CO3
4	Object Oriented Concepts			14	CO4
5	Functional Language Paradigms			4	CO5

Sessions: Total No. of Instructional periods available for the course

SESSION PLAN

UNIT-I

Lecture No.	Topics to be Covered	CO Mapped
1	Basic Computer Organization	CO1
2-3	Evolution of programming languages	CO1
4	Program Execution	CO1
5	Data Storage/Representation	CO1
6	Basics of programming environment	CO1
7	Concept of compiled program	CO1
8	Text editors, Debuggers	CO1
9	Basic Program Design and Abstractions	CO1
10	Flow chart and Algorithms	CO1
11	Syntax and semantics	CO1
12	Problem representation for Programming	CO1
Online	Quiz-1 (Unit 1)	CO1

UNIT-II

Lecture No.	Topics to be Covered	CO Mapped
1	Variable Names, variables, binding	CO2
2	Type checking	CO2
3	Scope, scope rules, Lifetime and garbage collection	CO2
4	Primitive data types, Strings	CO2
5	Array types, associative arrays	CO2
6	Record types, union types	CO2

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7	Pointers and references	CO2
8-9	Arithmetic expressions, type conversions, relational and Boolean expressions, Assignment statements, mixed mode assignments	CO2
10	Control structures – selection, iterations, branching, guarded statements	CO2
Online	Quiz-2 (Unit 2)	CO2

UNIT-III

Lecture No.	Topics to be Covered	CO Mapped
1	Subprograms, design issues, Local referencing	CO3
2	Parameter passing	CO3
3	Overloaded methods, Generic methods	CO3
4	Design issues for functions	CO3
5	The semantics of call and return	CO3
6	Implementing simple subprograms	CO3
7	Stack and dynamic local variables	CO3
8	Nested subprograms, blocks, dynamic scoping	CO3
Online	Quiz-3 (Unit 3)	CO3

UNIT-IV

Lecture No.	Topics to be Covered	CO Mapped
1	Object-orientation, Design issues for OOP languages, Benefits of OOPs	CO4
2-3	Implementation of class	CO4
4-6	Implementation of object oriented constructs	CO4
7	Message passing	CO4
8	Threads	CO4
9	Operator overloading	CO4
10	Exception handling	CO4
11	Event handling	CO4
12	Concurrency	CO4
13-14	Semaphores, Monitors	CO4
Online	Quiz-4 (Unit 4)	CO4

UNIT-V

Lecture No.	Topics to be Covered	CO Mapped
1	Introduction to Functional programming languages, Fundamentals of functional programming languages	CO4
2	Brief use of Scheme, ML	CO4
3	Introduction to logic and logic programming	CO4
4	Brief use of Prolog	CO4
Online	Quiz-5 (Unit 5)	CO4

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