19CSE201 :Advanced Programming

Lecture 0
Course Administrivia

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Course Objectives

- Primary objective of this course is to introduce advanced programming concepts such as Object-oriented paradigm, advanced pointers etc..,

- This course focuses on learning Python and C++ with an emphasize on ADT and STL usage for implementing data structures

Pre-Requisite(s): 19CSE102 Computer Programming

Course Outcomes

	Course Outcome	Bloom's Taxonomy Level
CO 1	Understand the static object-oriented programming concepts and thereby to understand a given program.	L3
CO 2	Understand the dynamic object-oriented programming concepts and thereby to understand a given program.	L3
CO 3	Implement ADT in static and dynamic object-oriented paradigm.	L3
CO 4	Analyze the similarities, differences and code efficiency among object-oriented programming languages.	L4
CO 5	Develop computer programs that implement suitable algorithms for given problem scenario and applications.	**L4**

Lab Based Course

L-T-P-C: 2-0-3-3

Evaluation Pattern:

Component	Weightage
Quizzes	20 Marks
Assignments/Tutorials	20 Marks
Programming Evaluations	30 Marks
End Semester Exam	30 Marks
Total	100 Marks

Syllabus

- Unit 1
- Overview of Object Oriented Paradigm, Programming in C++: Objects as a group of variables, Classes as a named group of methods and data, Morphing from structures to classes, Input and Output, Access Specifiers, Member functions: Accessor, Mutator and Auxiliary, Constructors and Destructors, New and Delete Operators, Overloading, Inheritance: Handling Access and Specialization through Overriding, Polymorphism: Virtual Functions, Abstract Class and Virtual Function Tables.

Syllabus Cont.

- Unit 2
- Revisiting Pointers: Pointers to Pointers, Pointers and String Array, Void Pointers and Function Pointers, Standard Template Library, Implementation of Stack, Queue, Hash Table and Linked Lists with STL.
- Basic Python: Multiparadigm language, Data Types and Variables, Indentation, Input and Output statements, Lists and Strings, Deep and Shallow Copy, Tuples and Dictionaries, Set and Frozen Sets, Control Statements and Loops, Iterators and Iterable, Functions, Recursion and Parameter Passing, Namespaces and Variable Scope, Exception Handling.

Syllabus Cont.

- Unit 3
- Object Oriented Concepts in Python: Class, Instance Attributes, Getters, Setters, Inheritance, Multiple Inheritance, Magic Methods and Operator Overloading, Class Creation, Slots, Meta Classes and Abstract Classes, Implementation of Stack, Queue, Hash Table and Linked Lists

Syllabus uploaded on
Intranet/AUMS/AMPLE

Study Materials

- Text Book(s)
  - Stroustrup B. Programming: principles and practice using C++. Second edition, Addison Wesley; 2014.
  - Charles R. Severance. Python for Everybody: Exploring Data Using Python 3, Charles Severance; 2016.
- Reference(s)
  - Guttag J. Introduction to Computation and Programming Using Python: With Application to Understanding Data. Second Edition. MIT Press; 2016.
  - Gaddis T. Starting Out with Python. Third Edition, Pearson; 2014.
  - Lambert KA. Fundamentals of Python: first programs. Second Edition, Cengage Learning; 2018.

Lab Environment

- HPOJ
  - Register yourself on https://hpoj.cb.amrita.edu:8000/
  - Username should be complete roll number in lowercase without dots.
    - Example: if roll no is CB.EN.U4CSE19432, your username should be cbenu4cse19432
  - Use only Amrita email.
  - WARNING: Make no spelling mistakes in either username or email
- Additional installation required: SEB – Safe Exam Browser
  - https://safeexambrowser.org/download_en.html

IMPORTANT INSTRUCTIONS

- Ask Relevant Questions!!
  - If you don't understand the topic or have any relevant doubts, ASK!
- Take Notes
  - The slides are useful, but class notes and discussion notes are even more useful
- Be Prompt
  - Whether it's a programming assignment or a researched theoretical assignment or even a written tutorial, Submit them within the deadline. It will not be accepted beyond deadline
- Be Honest
  - Being honest has its own rewards as will be evident during the course.

Welcome to the Course..!

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