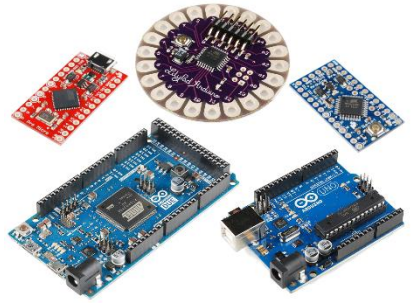
CSN-103: Fundamentals of Object Oriented Programming

Instructor: Dr. Rahul Thakur

Assistant Professor, Computer Science and Engineering, IIT Roorkee

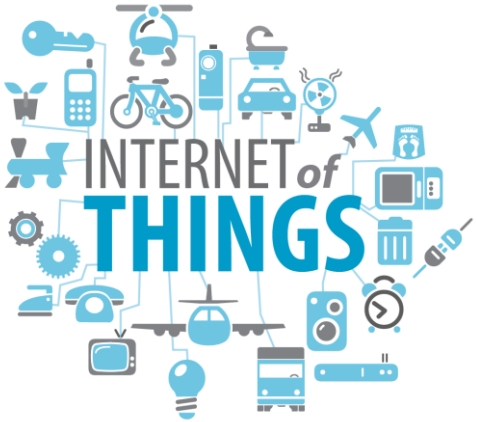
Instructor Biography



- **Name: Dr. Rahul Thakur**

  Assistant Professor, CSE, IIT Roorkee

  - Assistant Professor, **BITS Pilani Goa Campus**
  - Ph.D., **IIT Madras**
  - M.S., **IIT Madras**
  - B.E., **Barkatullah University**
- Teaching Interest: Computer Networks and Wireless Communication
- Research Interest: Cellular and Wireless Networks, Home Automation, Vehicular Networks, Internet of Things….



Course Information & Prerequisites

- Course Information
  - Course Title: **Fundamentals of Object Oriented Programming**
  - Course Code: **CSN-103**
  - Instructor In-charge: **Dr. Rahul Thakur**
  - Office: **S-131**
  - Email and VOIP: **rahulfcs@iitr.ac.in, +91-1332-285644**
- Prerequisites
  - None, however, **C Programming** (Desirable)
- Only CS and Electronics students can enroll
    - 160-180 Student Registrations
    - Expected number of TAs: 3

Course Plan and Modules

- Introduction: (3 Hr)
  - Introduction to computer systems, computer as a programmed machine; machine language, assembly language, high level languages; concept of flow chart and algorithms, algorithms to programs, object oriented programming concept, difference in approach from procedural programming
- Introduction to Java Programming Environment: (3 Hr)
  - Java compiler and virtual machine, Structure of a Java program, stand-alone programs and applets; concepts of portability
- Programming Elements in Java: (6 Hr)
  - Data types, variables and array operators
  - Assignment and selection statements
  - Iterative structures, nested loops
  - String handling in Java, I/O mechanism, command line arguments.

Course Plan and Modules

- Classes in Java: (10 Hr)
  - General form of a class, creating objects, access control in classes
  - Constructors, methods, parameters, method overloading
  - Recursive methods, returning objects, static members
  - Finalization, final qualifier, nested and inner classes
- Dynamic Memory: (5 Hr)
  - Pointers, references and dynamic memory handling in C++
  - Objects as references in Java
  - Dynamic memory allocation and garbage collection in Java
- Inheritance: (5 Hr)
  - Super classes and subclasses
  - The keyword extends, multilevel hierarchy
  - Method overriding; run time polymorphism
  - Abstract classes, final in inheritance, the object class

Course Plan and Modules

- Packages and Interfaces: (3 Hr)
  - Defining package, access protection
  - Importing classes and packages
  - Defining and implementing interfaces, nested interfaces, use of interfaces, variables in interfaces
- Exception Handling: (4 Hr)
  - Fundamentals, types of exceptions, catching exceptions, multiple catching,
  - Nested try statements, uncaught exceptions, throw and throws
  - Finally mechanism, built-in exceptions, creating exception subclasses, using exceptions
- Applets: (3 Hr)
  - Applet fundamentals, native methods, static import, the
  - applet class, applet display method, requesting repainting

Books

1. *Herbert Schildt,* **"Java The Complete Reference Java,"** Tata McGraw Hill Publishing, 9th Edition
2. *Bert Bates*, **"Head First Java,"** O'Reilly, 2nd Edition
3. *Dietel H.M., Dietel P.J.,* **"Java: How to Program",** Prentice-Hall, 7th Edition
4. *Flanagan D., "Java in a Nutshell", O'Reilly Media, Inc., 5th Edition*
5. *Eckel B.,* **"Thinking in Java",** Prentice-Hall.
6. *Gosling J., Joy B., Steele G., Bracha G.,* **"The Java Language Specification"**, Prentice-Hall, 2nd Edition.
7. *Xavier C.,* **"Java Programming – A Practical Approach",** Tata McGraw-Hill

- Additional Books and Reference Material

Evaluation Components and Schedule

- **Evaluative Component**
  - **Mid-Term Exam: 30%**
  - **End-Term Exam: 40%**
  - **Class Work Sessional: 15% → Tutorials\Assignments**
  - **Practical: 15% → Labs**

- **Schedule**
  - **Class (LHC-005)**
    - **Tuesday: 03:00 – 03:55 PM**
    - **Wednesday: 02:00 – 02:55 PM**
    - **Friday: 02:00 – 02:55 PM**
  - **Lab Sessions (Computer lab 1)**
    - **Wednesday: 11:00 – 01:00 PM**
    - **Thursday: 11:00 – 01:00 PM**
  - **Extra Classes (if necessary)**

Problem with the Schedule?

Lab Sessions

- Students are divided into 4 batches
  - Batch 1: (O1-O2) → CSE 1st year (Top 50%)
    Alternate Weeks
  - Batch 2: (O3-O4) → CSE 1st year (Bottom 50%)

Thursday: 11:00 – 01:00 PM

  - Batch 3: (O5-O6) → ECE 1st year (Top 50%)
    Alternate Weeks
  - Batch 4: (O7-O8) → ECE 1st year (Bottom 50%)

Wednesday:11:00 – 01:00 PM

- **CHEATING** and

USE OF UNFAIR MEANS

Other Relevant Information

- Mode of Teaching: PPT (Preferred) and Board
- Attendance: Not Compulsory (Classes) and Strict (Lab)
- Re-Examination: Medical/Exceptional Cases Only
- Resources: Piazza -- Slides, Notes, Assignments, Updates

  www.piazza.com/iitr.ac.in/summer2019/csn103
- Mode of Communication
  - **Email:** rahulfcs@iitr.ac.in (Preferred)
  - **VOIP:** Availability is not guaranteed
  - **Class Representative (CR)**
- First Lecture: 24th July 2019
- Last Lecture: 8th November 2019
- Number of Lectures: ~ 35-42

Questions?