Course IME 603, Odd (Fall) Semester 2017

Time and Place: W 10:30 – 12:00 C3*
F 10:30 – 12:00 C3
*hands-on classes will be in IME bridge

Course: IME 603, Introduction to Computing
Instructor Name: Shankar Prawesh, Ph. D.
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Teaching Assistant:

Faculty Office Hours: Tuesday 12:00 – 12:30 (IME 307)

Course Description and Objectives

Computing - Computer organization, Java basics, Number systems - Data representation, Control flow, Arrays, Functions (methods) and modules, Object-oriented programming, Algorithms for searching and sorting, Data structures like linked-lists, stacks, queues and trees, Complexity of algorithms, File processing and file management, case-studies on programming.

Student Learning Outcomes:
- Understanding of the basic concepts behind programming and software development
- An ability to design and analyze an algorithm for the given problem
- An ability to translate research/business problems in algorithms

Prerequisite

Basic knowledge of calculus, linear algebra and probability & statistics will be assumed.

Course Materials, Text etc.

Course Material: Power point slides if used for lectures will be provided to students. But students should recognize the slides are mnemonics for the instructor, and in no way substitute for lecture notes and text material. Hence students are STRONGLY ADVISED to take class notes.

The following texts will be used for reference.

Text Book:

Introduction to Programming with Java: A Problem Solving Approach, John Dean and Ray Dean, *McGraw Hill Education* (2012).

Data Structures and Algorithms in Java 6/e, Goodrich, Tamassia, Goldwasser, *Wiley India Pvt Ltd*. (2015).

Online Resources:

Course website: www.piazza.com

http://highered.mheducation.com/sites/007337606x/information_center_view0/index.html

http://as.wiley.com/WileyCDA/WileyTitle/productCd-EHEP003087.html

Teaching method and course emphasis: The course will be mostly based on lectures, quizzes and take home assignments. Learning outside the class from other sources is highly encouraged. The course emphasizes the application of learned programming techniques in all possible domains.

Other material/readings, if necessary, will be handed out in the class or will be posted on the course website.

Course Policies

Assignments related to different topics will be made available as the course progresses. These assignments are designed to provide you with a chance to apply the concepts learned in the class into real life problems.

Attendance Policy Class attendance and participation is expected, and in past class attendance has been proven as a prerequisite for doing well in the course. Students are expected to be prepared for class and able to contribute to the class discussion. Students may be called on at random to offer their views. If you miss a class it is your responsibility to cover the material.

Cell phone Smart phone, iPhones, iPads, MP3 players are to be turned off during class. The use of phones during class is strictly prohibited.

Food and drink No food inside the classroom. Only a water bottle is permitted (No other beverages).

Use of laptops/tablets No emails/chatting/social-media are allowed during the class. Use computers judicially in the class. Please note, they are a privilege and abuse will lead to loss of use.

Course Grade Determination

Exams and grading policy There will be two exams (including the final). Mid-term exam and the final exam constitute 30% and 45% of your grade, respectively. There will be quizzes at regular interval that constitute 15% of your grade, and one take home assignment worth 5% of your grade. Remaining 10% of your grade will be awarded based your class attendance and participation. No make-up exams will be given nor deadlines extended for the assignment. Failure to turn in any one, exams or the assignment, will result in a grade of 0.

Note: All assignment will be submitted online through Turnitin for plagiarism check.

Marks Distribution and Grades: <u>Mid-Semester Exam:</u> 30 + <u>Quizzes and the take-home assignment:</u> 20 (15+10) + <u>Final Exam:</u> 45 + Attendance: 10.

Marks	Grades
85 and above	A
75-85	B
65-75	C
50-65	D
Below 50	F

Resource Guide

Official Class Cancellation

In the event that the Institute officially cancels classes for any reason, the class activity (homework, test, etc.) scheduled for the canceled date is automatically rescheduled for the next date that class is officially in session.

Honor System: Plagiarism and Academic Integrity

The honor system assumes the responsibilities of students and faculty in upholding academic integrity, while at the same time respecting the rights of individuals to the due process offered by administrative hearings and appeals. Accordingly, "members of this academic course are required to conduct themselves in accordance with the highest standards of academic honesty and integrity." In addition, all members are required to:

- Agree to be bound by the Honor System and its procedures;
- Report suspicion or knowledge of possible violations of the Honor System;
- Support an environment that reflects a commitment to academic integrity;
- Answer truthfully when called upon to do so regarding Honor System cases, and,
- Maintain confidentiality regarding specific information in Honor System cases.

Most importantly, "All students are presumed upon enrollment to have acquainted themselves with and have an understanding of the Honor System".

In this class, because coursework may be collaborative at times, particular issues of integrity arise. You should not copy or print another student's work without permission. Any material (this includes IDEAS and LANGUAGE) from another source must be credited, whether that material is quoted directly, summarized, or paraphrased. **In other words, you should respect the work of others and in no way present it as your own.**

Student with Disabilities

If you have a physical or mental impairment that requires an academic adjustment or accommodation, arrange a meeting with me at your earliest convenience.

Student Conduct in the Classroom

The instructional program is based upon the premise that students enrolled in a class are entitled to receive instruction free from interference by other students. Accordingly, in classrooms, laboratories, studies, and other learning areas, students are expected to conduct themselves in an orderly and cooperative manner so that the faculty member can proceed with the customary instruction. Faculty members (including graduate teaching assistants) may set reasonable standards for classroom behavior in order to serve these objectives.

Religious Observances Students desiring to observe religious holiday of special importance must provide advance written notification to the instructor by the end of the second week of classes.

Email Policy e-mail is the most convenient way to contact the instructor.

Important Dates

 http://www.iitk.ac.in/doaa/data/calendar2017.pdf

Tentative Schedule

Schedule of Topics (Subject to Change)

Outline of Topics and Course Schedule Because of unforeseen circumstances and responsibilities it is possible the instructor will not be able to meet the scheduled class period. In case this event occurs, barring an emergency, the class will be notified and the class period will be rescheduled. So, be advised that the following class schedule is *tentative* and subject to alteration as dictated by the pace, ability and interest of the students. In class discussions, material difficulty and external forces may also dictate alterations.

Date	Course Content
Class 1	Introduction, Course Logistics, Eclipse, Ch.1 (Dean & Dean)
Class 2-3	Java syntax Ch.2 (Dean & Dean) Data types, primitive and reference variables Ch 3. (Dean & Dean)
Class 4-7	Control flow, conditionals and loops: if, while, for loop, switch Ch 4. (Dean & Dean)
Class 8-9	Methods: static methods, arguments in a method, libraries, random numbers, standard statistics Ch 4. (Dean & Dean)
Class 10-12	Object Oriented Programming Ch. 6, 7 (Dean & Dean)
Class 13-14	Inheritance and Polymorphism Ch. 13 (Dean & Dean)

(Mid-semester exams)	
Class 15	Arrays Ch. 10 (Dean & Dean)
Class 16-17	Files Ch. 15 (Dean & Dean)
Class 17-20	Data structure: Linked-list, Stacks, Queues Ch. 3, Ch. 6 (Goodrich)
Class 21	Complexity analysis, (Ch. 4)
Class 22-23	Trees, Ch. 8 (Goodrich)
Class 24	Recursion, Ch. 5 (Goodrich)
Class 25	ArrayList, Ch. 7 (Goodrich)
Class 26-28	Sorting and Selection, Ch. 13 (Goodrich)