Introduction Information Systems

A Practical Approach

(Text in red may/will change)

Monday: 1:00 pm - 4:00 pm, Room BL224/225

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NOTE: Text items in blue are clickable hyperlinks.

Course Description

The purpose of this course is to provide a common basis for understanding the nature of information systems in their organizational contexts; the various perspectives for analyzing them and how they can be studied in a rigorous way in terms of organizational purposes and functions. This course is meant to be a practical discovery of some internals of information systems. Topics covered will include: definition of an information system; methods of development of information systems; interaction among components; principal systems technologies (e.g. file system, database, networking); implementation of small information system components (e.g. text analyzer); use of a programming language to perform basic tasks.

Note effective September 2013

In transitioning to the new IS&D concentration (from the current status of IS&D as a path), we are (re)introducing an updated version of INF1340H (previously taught until 2009). Building upon the basic knowledge acquired in INF1003H, this course will explore fundamental concepts of information systems in greater depth. There will be a deeper coverage of technical topics, including software principles and practices, programming concepts and techniques, data structures, and system development methods and practices. As in INF1003H, there will be an emphasis on a critical understanding of the interaction between technical systems and their components on one hand and organizational actors and contexts on the other. These will be explored through in-depth discussions of case studies, live programming in-class by the instructor and team programming for the students. The course will provide a firm foundation for specializing in Information Systems and Design.

Prerequisites

Students are expected to have some familiarity with information technology concepts such as hardware, software, networks, and systems/program design. Students with little or no experience with IT systems are encouraged to take 1003 concurrently with or before taking 1340.

Note:

Replaced by INF1003, Fall 2009, only for those wishing to adhere to requirements effective until August, 2013. Required for the IS&D concentration effective September 2013. Not equivalent to INF1003H under the requirements effective September 2013.

Course Structure

The course is intended to give you skills for writing programs as part of Information Systems. We will focus on tasks that are related to simple data analysis.

Three (3) in-class hours per week will be divided into lectures and tutorials, in which we discuss and further probe topics covered in the lectures and readings. Note that for every one (1) hour of class time, students can expect to do 2.5 hours of reading and preparation work on their own, outside class. **Since this class will include code writing, it is highly recommended that you practice programming on your own**.

During the class hours, students will be assigned to groups and work together on various activities that will assist in completing course work. We will conduct in-class programming exercises that may or may not (pen-and-paper) need a computer.

Deliverables and Evaluation

Course evaluation	Due Date	Worth
Midterm test: This is an in-class individual test covering material from the first five weeks of the course. The time allowed is 3 hours and it will be an open-book, open-notes exam. It will be written on paper.	Oct. 21 (week 6)	15%
Assignment 1: In this assignment, students will develop a set of functions that perform simple arithmetics tasks in Python.	Oct. 7 (week 5)	10%
Assignment 2: In this assignment, students will develop a set of functions that perform simple text analysis tasks in Python.	Nov. 20 (week 9)	10%
Assignment 3: In this assignment, students will develop an application that perform numerical and text analysis tasks in Python.	Dec. 9 (week 12)	10%
Final exam: This will be a final exam. It will be an open-book, open-notes exam.	Dec. 9 (week 12)	55%

Every effort will be given to respect the above deadlines. If necessary changes need to be made, they will always affect students in a positive manner, e.g., extension to a deadline. There can be no change in the final exam data and no extensions given after week 13 of classes.

Notes about coursework: Groups: Students will be assigned to groups of 2 in the first couple of weeks of the course. These groups will work on activities during the classes, all term, to complete Assignment 2 together.

Self and peer assessment: Assignment submission will include self and peer assessment forms that must be completed by each group member separately. When students upload their assignments (on Blackboard) they will be asked to upload a special form discussing the teamwork. These forms are strictly confidential and will be provided during the course (on Blackboard).

Labs: They will be made small enough so that they can be completed within an hour or so. Students are encouraged to complete them during or after tutorial times.

Exercises: After each lecture we will solve small tasks in-class. We will focus on working towards your labs. Students are encouraged to stay in the labs and work in their groups in order to get full marks.

Assignments: Students will work with a partner on their assignments. We expect that partners working together will use a team-programming approach similar to the one used in labs. Splitting the work and performing the tasks separately will not help prepare you for the tests and final exam. More details about a team-programming paradigm will be given in class.

All coursework will be available on Blackboard with detailed instructions and submission deadlines (date/time). There will also be an announcement section, which students should be responsible for checking regularly.

Readings

NOTE: The following schedule and reading material is tentative and may change during the semester. Readings may be removed or merged and new ones may be added. In all cases, the readings will be assigned and posted prior to each class.

Textbook:

- **[GCM]** Practical Programming (2nd edition).
  Paul Gries, Jennifer Campbell, Jason Montojo.
  Publisher's Website

Every effort will be made to get some copies on-reserve in the IFORUM and the University of Toronto bookstore.

Programming Resources:

- **Python 3 compiler**: It can be downloaded from the official Python website. NOTE: make sure you download the version available for your operating system.
- **Online Python Tutor**: An in-browser visual tutor for Python can be found here.
- **WingWare Python IDE**: An integrated Development Interface (IDE) for Python can be found here. NOTE: Mac OS X users need to download XQuartz.

Weekly Schedule

The course material is broken down per week. Information and handouts for exercises and labs will be given on Blackboard during the semester.

1. **[9/9] Course Introduction**: Introduction to programming, shell sessions.

   [GCM]: Chapters 1 and 2.

2. **[16/9] Hello World, Hello Python**: How does a computer run a program.

   [GCM]: Chapters 1 and 2.

3. **[23/9] Functions, Modules, Classes**.

   [GCM]: Chapters 3, 4, 6.1, 6.2.

4. **[30/9] Data types**.

   [GCM]: Chapters 4, 5, 6.

5. [**7/10**] **Working with Strings**.

   [**GCM**]: Chapters 4, 5, 6, 9.2.

6. [**21/10**] ***** In-class midterm***

7. [**28/10**] **Lists**.

   [**GCM**]: Chapters 8, 9.

8. [**11/11**] **Working with files**.

   [**GCM**]: Chapter 10.

9. [**18/11**] **Tuples and Dictionaries**.

   [**GCM**]: Chapter 11.2 - 11.7.

10. [**25/11**] **Databases**.

    [**GCM**]: Chapter 17.1 - 17.3.

11. [**2/12**] **Visualization with Python**.

    [**GCM**]: Chapter 17.

12. [**9/12**] ***** In-class final test***

Learning Outcomes

Students will learn to implement modules that can form parts of larger Information Systems. More specifically students:

1. will learn what are the main component of implementing an Information System;
2. will be introduced to an intuitive and highly used programming language, Python;
3. will perform coursework in a team programming paradigm;
4. will design, implement and execute function that perform numerical and textual analysis of data;

Relationship to Masters of Information (MI) Program-Level Student Learning Outcomes

Master of Information Program-Level Student Learning Outcomes can be found here.

Information Systems are composed of smaller components. Designers, systems analysts and programmers need to have a good understanding of the internals, in order to take more accurate and knowledgeable decisions. To achieve this, INF1340H is a fundamental course that defines Information System components in terms of functions and modules that can be practically implemented. This course will help students to become conversant with Information Systems fundamentals and theories (**Outcome 1**). Given the case studies and practical assignment in this course, the students will develop an understanding of the development of theory concerning information, where it is found, and how it is used (**Outcome 4**). Through the use of a programming language, students will develop an understanding of the application of new technological developments to the preservation and communication of information, and in the identification of the impact of such developments on society (**Outcome 5**). Finally, the course will allow students to develop their own goals and continue in life-long intellectual growth beyond graduation (**Outcome 6**).

General Expectations

1. **Communication Policy:** Please do not email questions to the instructors or TAs. If you have a question, there is a pretty good chance that other people in the course have the same question or, at least, will benefit from the answer. Please post all the questions to Blackboard (forum threads to be announced) so everyone in the course can benefit from your questions and our answers. Questions posted to Blackboard will be answered within two (2) business days. Students are encouraged to post answers to the questions of other students where appropriate.

   IMPORTANT: Please prefix the subject of your emails to the instructor and TA with "INF1340H" and include some more details, e.g., "INF1340H: book appointment October 1st".

2. **Readings:** It is important to complete the required readings before the lecture in order to fully benefit from the class activities.

3. **Late policy:** Late submission of an assignment carries a penalty of one grade (e.g. from B+ to B) for each week, to a maximum of two weeks; submissions will not be accepted after two weeks. Exceptions will be made only when supported by appropriate documentation.

4. **Academic Integrity:** The essence of academic life revolves around respect not only for the ideas of others, but also their rights to those ideas and their promulgation. It is therefore essential that all of us engaged in the life of the mind take the utmost care that the ideas and expressions of ideas of other people always be appropriately handled, and, where necessary, cited. For writing assignments, when ideas or materials of others are used, they must be cited. You may use any formal citation format, as long as it is used consistently in your paper, the source material can be located and the citation verified. What is most important is that the material be cited. In any situation, if you have a question, please post it to Blackboard. Such attention to ideas and acknowledgment of their sources is central not only to academic life,

but life in general. Please acquaint yourself with UofT's Code of Behaviour on Academic Matters.

5. **Participation and Attendance:** Discussion and interaction in the classes are important ways to learn. Sharing your experiences and ideas with your classmates is central to your learning experience in this course. As such, you should attend and participate in every class. There will also be exercises and discussions that you will participate in within your groups in your class. Some of the activities will be very helpful in completing your assignments.

6. **Students with Special Needs or Health Considerations:** All students are welcome in this course and we will make every effort to ensure a meaningful, respectful, and positive learning experience for everyone. If there are special considerations that you require to help you successfully fulfill the requirements of the course, please feel free to see one of the instructors, the Faculty of Information Student Services, and/or contact the Accessibility Student Office as soon as possible so we can ensure you are able to successfully meet the learning objectives for this course.

7. **Writing Resources:** Please review the material you covered in Cite it Right, familiarize yourself with the How Not to Plagiarize site and UofT's policy, and consult the Office of English Language and Writing Support as necessary.