Syllabus

Catalog Description:
Introduces basic procedural and object-oriented programming. Topics include: variables, data types, assignments, conditionals, loops, arrays, input/output, static methods, libraries, recursion, data types, API, classes, access modifiers, instance variables, constructors, instance methods, testing, encapsulations, immutability, interface inheritance, implementation inheritance, exceptions, assertions, analysis of algorithms, order of growth, memory usage, binary search, insertion sort, merge sort, stacks, array implementation of stacks, linked list implementation of stacks, queues, generics, autoboxing, iteration, symbol tables, hash tables, binary search trees, examples and applications.

Expected outcomes:
At the end of the course students will achieve the following outcomes:
- Students understand and apply basic procedural programming principles.
- Students understand and apply basic object-oriented programming principles.
- Students understand, analyze, compare and apply basic data structures and their implementation.
- Students understand, analyze, compare and apply basic sorting methods.
- Students understand, analyze, compare and apply basic searching methods.

Prerequisites:
The course requires basic information technology knowledge. This is a remedial programming course for the MS Applied Information Technology.

Sections

<table>
<thead>
<tr>
<th>Section</th>
<th>Instructor</th>
<th>Online Session</th>
<th>GTA</th>
<th>GTA Office Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>DL1</td>
<td>Mihai Boicu (mboicu)</td>
<td>Friday: 4:30PM-5:30PM; Tuesday: 9:00AM-10:00AM;</td>
<td>Amrita Jose (ajose4)</td>
<td>Monday: 4:30PM-5:30PM;</td>
</tr>
</tbody>
</table>

Online Session, GTA Office Hours
You must either participate or watch the recordings of the instructor online sessions. The GTA office hours are not recorded. The GTA will provide feedback based on a first come first served basis. Details are published on the Blackboard site of the course.
Instructor Information

The following instructors are teaching this course in various semesters. Check above to see who is teaching your section this semester.

Dr. Mihai Boicu (Associate Professor)
Email: mboicu@gmu.edu (preferred communication method)

Prof. Emilia Butu
Email: ebutu@gmu.edu (preferred communication method)

Course Coordinator

Dr. Mihai Boicu (Associate Professor)
Email: mboicu@gmu.edu (preferred communication method)
Email subject: CC-AIT502

Please contact the course coordinator only after you discussed the issue with your GTA and course instructor. In the email subject please include the course number and section.
The course coordinator will be contacted by the department or school for all the issues related to this course. Therefore, contacting first the course coordinator will determine a faster response.

(the syllabus continues on the next page)
Textbook

Introduction to Programming in Java: An Interdisciplinary Approach  
by Robert Sedgewick (Author), Kevin Wayne (Author) – Princeton University

You must have one of the following editions. Many assignments and readings are based on the textbook. Without access to the textbook your performance in the course will suffer.

First Edition:
- ISBN-10: 0321498054
- Amazon: [https://www.amazon.com/Introduction-Programming-Java-Interdisciplinary-Addison-Wesley-dp-B00ME3LSA2/dp/B00ME3LSA2](https://www.amazon.com/Introduction-Programming-Java-Interdisciplinary-Addison-Wesley-dp-B00ME3LSA2/dp/B00ME3LSA2)

Second Edition:
- ISBN-10: 0672337840

Course Web Site:
- [https://introcs.cs.princeton.edu/java/home/](https://introcs.cs.princeton.edu/java/home/)

Additional readings, tutorials and online materials will be recommended during the course.

*(the syllabus continues on the next page)*
Schedule

This is a preliminary schedule that might be changed during the semester. The instructor will announce on Blackboard all the changes to this schedule.

All the assignments for the module are due at 11:59PM on the due date. It is highly recommended to submit the assignments before 11:00 PM to avoid last moment technical issues. No exception will be made for last moment technical issues. Late policy is explained below.

Due dates and exam dates are posted on Blackboard for each module (week) as they might vary for each section. The section schedule posted on Blackboard is considered as an integrated part of the syllabus.

<table>
<thead>
<tr>
<th>Module/Week</th>
<th>Topic / Readings</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Chapter 1. Elements of programming</td>
</tr>
<tr>
<td></td>
<td>1.1. Elements of programming; 1.2. Built-in types of data;</td>
</tr>
<tr>
<td>2</td>
<td>1.3. Conditionals and Loops</td>
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<tr>
<td>3</td>
<td>1.4. Arrays</td>
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<tr>
<td>4</td>
<td>1.5. Input and Output; 1.6. Case Study: Random Web Surfer Exam 1 (Chapter 1: Section 1-4)</td>
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<tr>
<td>5</td>
<td>Chapter 2. Functions and Modules</td>
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<tr>
<td></td>
<td>2.1. Defining Functions</td>
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<tr>
<td>6</td>
<td>2.3. Recursion</td>
</tr>
<tr>
<td>7</td>
<td>2.2. Libraries and Clients; 2.4. Case Study: Percolation Exam 2 (Chapter 1; Chapter 2: Section 1,3)</td>
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<tr>
<td>8</td>
<td>Chapter 3. Object Oriented Programming</td>
</tr>
<tr>
<td></td>
<td>3.1. Using Data Types</td>
</tr>
<tr>
<td>9</td>
<td>3.2. Creating Data Types</td>
</tr>
<tr>
<td>10</td>
<td>3.3. Designing Data Types</td>
</tr>
<tr>
<td>11</td>
<td>3.4. Case Study: N-Body Simulation Exam 3 (Chapter 1, 2; Chapter 3: Section 1-3)</td>
</tr>
<tr>
<td>12</td>
<td>Chapter 4. Algorithms and Data Structures</td>
</tr>
<tr>
<td></td>
<td>4.1. Performance; 4.2. Sorting and Searching</td>
</tr>
<tr>
<td>13</td>
<td>4.2. Stacks and Queues</td>
</tr>
<tr>
<td>14</td>
<td>4.3. Symbol Tables; 4.5. Case Study: Small-World Phenomenon</td>
</tr>
<tr>
<td>15</td>
<td>Final Exam 1 (Chapter 1-4)</td>
</tr>
</tbody>
</table>
Grading:

The students will be assigned a grade based on the following components:

- Weekly Assignments (4%*14 = 56%)
- Exams 1-3 (8%*3 = 24%)
- Final Exam (20%)
- Bonus points might be provided during the semester at the discretion of the instructor (max 3% for a student)

The grading scale for this course is:

<table>
<thead>
<tr>
<th>Numeric Grade</th>
<th>Letter Grade</th>
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<tbody>
<tr>
<td>97 – 100%</td>
<td>A+</td>
</tr>
<tr>
<td>93 – 96%</td>
<td>A</td>
</tr>
<tr>
<td>90 – 92%</td>
<td>A–</td>
</tr>
<tr>
<td>87 – 89%</td>
<td>B+</td>
</tr>
<tr>
<td>83 – 86%</td>
<td>B</td>
</tr>
<tr>
<td>80 – 82%</td>
<td>B–</td>
</tr>
<tr>
<td>70 – 79%</td>
<td>C</td>
</tr>
<tr>
<td>0 – 69%</td>
<td>F</td>
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</table>

Late Policy

For full grade, students must submit all the work based on the due dates published on Blackboard. There are two exceptions to this rule.

Non-academic exception: The student must provide a documented case for a non-academic exception (e.g. doctor notice if an illness prevented the student to perform the course assignments). Contact information for any third party must be provided and written approval for the instructor to contact the third party for confirmation. A new due date must be requested by the student. If the exception is approved by the instructor, the student may submit the work with no penalty.

Late submission penalty: For all submissions there is one day grace period, followed by a 10% of assignment points penalty each day (full or partial). For instance, a 4-point assignment submitted 2 days and 4 hours late that obtained 3 points will have an additional 0.8 penalty (one day grace period for first day, 0.4 penalty for the second day and 0.4 penalty for the partial third day). Therefore the grade for the assignment is 2.2 points.

Exams (during COVID)

There are four exams in this course – 3 short one-hour exams, and the final exam. The exams must be taken during online session at the scheduled date. The student must have 2 devices.
A computer prepared for a Blackboard Respondus with monitor exam (you must have microphone and video camera connected to the computer)

• A ZOOM connection (may be on a mobile device – phone, iPad or on another computer)

The exam must be taken in a quiet, isolated room. The ZOOM device must point from a short distance to the workplace showing, the computer monitor, student hands and face.

A pool of students may be selected for an oral examination based on the exam. The students in the pool will be selected on 2 criteria. (i) 3 students randomly (ii) around 7 based on the analysis of the monitor video and ZOOM connection. The students who are not able to explain correct solutions provided in the exam will have the grade for the exam changed to 0 and may be referred to the honor committee.

Hardware and Software requirements

For all sections you must have a personal computer with internet connection. It is strongly recommended that you have a powerful enough laptop on which you can perform code development that you can bring to class.

For the online section you must have a personal computer with internet connection, with video camera, speakers and microphone. Also you must have a mobile device with ZOOM installed, and having a video camera and microphone.

We require either a Mac OS X or Windows 10 computer.

Course Delivery Methods

The course will be delivered using various methods. You must have your MASON email account activated and you must check your email daily for announcements related to the course. You must have access to Blackboard Learning System and to know how to use its features.

There are video presentations posted on the Blackboard. You must have an environment in which you can watch these videos.

You will have several assignments and assessments to be performed each week. A summary of weekly requirements will be sent at the beginning of the week.

COURSE CANCELED (SNOW DAYS)

If the courses are canceled the first option is to have a synchronous meeting online during the same times. If you cannot be online the course will be recorded and posted on the course Blackboard site.
Intellectual Property

There is a strong recommendation that all work in the class projects to be done based on an open source license (e.g. Academic Free License http://en.wikipedia.org/wiki/Academic_Free_License). This will allow a rich, shared exchange of ideas and will allow each member of the class to further benefit with no restriction from the work performed in the class.

Privacy

Instructors respect and protect the privacy of information related to individual students. Specific issues relating to an individual student will be discussed via email, telephone or in person. Instructors will not discuss issues relating to an individual student with other students (or anyone without a need to know) without prior permission of the student. There is no guarantee related to the security of email and telephone conversations.

Assessable work other than final exams will be returned to individual students directly by the Instructor (or by a faculty or staff member or a Teaching Assistant designated by the Instructor, or via another secure method). Under no circumstances will a student's graded work be returned to another student.

Faculty and staff will take care to protect the privacy of each student's scores and grades.

Because of the nature of this class, some work performed by the student will be published and discussed in the class. Other students will be able to make comments and suggestions related to the published work, without seeing the actual grade the student earned for the work.

There are several competition opportunities during the class, with optional participation. Participation in a competition implies your agreement that the other students may see your work and points obtained during that competition.

Disability Accommodations

The Office of Disability Services (ODS) works with disabled students to arrange for appropriate accommodations to ensure equal access to university services. Any student with a disability of any kind is strongly encouraged to register with ODS as soon as possible and take advantage of the services offered.

Accommodations for disabled students must be made in advance – ODS cannot assist students retroactively, and at least one week's notice is required for special accommodations related to exams. Any student who needs accommodation should contact the Instructor during the first week of the semester so the sufficient time is allowed to make arrangements.
Honor Code

All members of the Mason community are expected to uphold the principles of scholarly ethics. Similarly, graduating students are bound by the ethical requirements of the professional communities they join. The ethics requirements for some of the communities relevant to Applied IT graduates are available via the following links:

- ACM Code of Ethics and Professional Conduct
- IEEE Code of Ethics
- EC-Council Code of Ethics

On admission to Mason, students agree to comply with the requirements of the Mason Honor System and Code\(^1\). The Honor Code will be strictly enforced in this course. Honor Code cases are heard by a panel consisting of students – students who meet the requirements are encouraged to nominate themselves to serve on the Honor Committee.

Any use of the words or ideas of another person(s), without explicit attribution that clearly identifies the material used and its source in an appropriate manner, is plagiarism and will not be tolerated. There is a "zero tolerance" policy for plagiarism within The Volgenau School. The Instructor reserves the right to use manual and/or automated means (including such services as Turnitin.com) to detect plagiarism in any work submitted by students for this course, and to direct Teaching Assistants and/or other faculty and/or staff members to do likewise in support of this course.

For this course, the following requirements are specified:

- All assessable work is to be prepared by the individual student, unless the Instructor explicitly directs otherwise.
- All work must be newly created by the individual student for this course for this semester. Any usage of work developed for another course, or for this course in a prior semester, is strictly prohibited without prior approval from the instructor.
- For team work a summary at the end of the submission must identify mutually agreed individual contributions.
- You must not publish your work and distribute your work for this course. Sharing your work with other students in the current or future sessions of this course is prohibited.

Students may seek assistance with assigned work (and are encouraged to do so if they feel the need), provided:

\(^1\) Available at [http://catalog.gmu.edu/](http://catalog.gmu.edu/) and related Mason Web pages.
- The directions for the assigned work do not prohibit such assistance.
- Such assistance is acknowledged in the submitted work, clearly identifying the person(s) giving assistance and the nature of the assistance given.
- Any work to be submitted is prepared entirely and exclusively by the student submitting it. Students are expressly prohibited from sharing any assessable work for this course in any manner with other students (except students assigned as Teaching Assistants or Undergraduate Peer Mentors to this course and the student's section), unless all students involved have had their work graded and returned by the Instructor, or the Instructor has explicitly approved such sharing.