Applied Information Technology Department

Course Syllabus

IT 499 Discrete Structures
updated 06.16.2014

Catalog Description
Introduces ideas of discrete mathematics including sets, logic, graphs, trees, basic counting arguments, and discrete probability. The course will also introduce high-level pseudocode. Students who have received credit for MATH 112 or MATH 125 may not receive credit for this course.

Prerequisites
A passing score on the Mathematics Placement Test or C or better in MATH 105 or MATH 108. Prerequisite enforced by registration system.

This requirement will be strictly enforced. Any student who does not meet the prerequisite requirement will be dropped from the course by the Instructor at the start of the semester and the student will be responsible for any consequences of being dropped.

Rationale
This course supports the BSAIT program requirement of Discrete Mathematics and will serve as equivalent to MATH 112 for purposes of degree completion as well as prerequisite.

Distance Education
Students taking this as an online course MUST have access to a scanner. Students will be REQUIRED to scan their written homework and upload it to the course Blackboard site.

Textbook
There is one required textbook for this course:

- Discrete Mathematics for BSIT
- Custom book for George Mason University
- Pearson Custom Publishing 2007
- ISBN: 0-536-29756-8

NOTE: Information regarding an available e-text is available: http://www.pearsoncustom.com/va/gmu_math112/
Faculty and Staff

Instructor and Course Coordinator:

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Grading

The grading scale for this course is:

| 99 – 100% | A+ | Passing |
| 92 – 98%  | A  | Passing |
| 90 – 91%  | A- | Passing |
| 88 – 89%  | B+ | Passing |
| 82 – 87%  | B  | Passing |
| 80 – 81%  | B- | Passing |
| 78 – 79%  | C+ | Passing |
| 72 – 77%  | C  | Passing |
| 70 – 71%  | C- | Passing* |
| 60 – 69%  | D  | Passing* |
| 0 – 59%   | F  | Failing |

* Grades of "C-" and "D" are considered passing grades for undergraduate courses. However, a minimum grade of "C" is required in the BSAIT program for any course that is a prerequisite for one or more other courses. This course is a prerequisite for several courses in BSAIT Program – see http://www.gmu.edu/catalog/courses/it.html for more information on those courses.

Raw scores may be adjusted by the Instructor to calculate final grades.
Final grades will be determined based on the following components:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Distribution</th>
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</thead>
<tbody>
<tr>
<td>Homework</td>
<td>40%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>25%</td>
</tr>
<tr>
<td>Exam(s)</td>
<td>35%</td>
</tr>
</tbody>
</table>

Notes:
- There are approximately 12 course content modules
- Late assignments are not accepted, for any reason
- Quizzes not submitted by the due date are scored at 0 points
- There are no extra credit opportunities
- Students are required to sit for the scheduled final exam – which is on-campus in a classroom

The grading components are outlined in the following sections. Note that not all assignments are given an equal weight.

Homework
Homework will be assigned for each course module. To receive credit for any part of any homework question – all written work must be shown in detail. No credit will be awarded for answers (even if they are correct) that are not supported by written work.

No late assignments will be accepted. Students may submit incomplete assignments for partial credit.

Quizzes
Quizzes will be given (either written or via Blackboard) to tests students’ mastery of the course material. Quizzes are closed notes, closed book: no external resources are permitted.

Exams
The final exam will be held during the scheduled final exam session (see [http://registrar.gmu.edu/](http://registrar.gmu.edu/)) and will be based on topics addressed throughout the entire course. The final exam will be “closed book” – no reference materials other than those provided with the exam paper will be permitted. Final exams will be retained by the Department of Applied Information Technology and will not be returned to students.

Final grades will be posted to PatriotWeb, which is the only vehicle for students to obtain those grades. A student with a "hold" on his/her PatriotWeb account will be unable to access final grades until the hold has been removed by the Registrar.
Course Outline

<table>
<thead>
<tr>
<th>Module</th>
<th>Chapter</th>
<th>Class Content</th>
</tr>
</thead>
</table>
| 1      | 5.1     | Course introduction  
|        |         | Introduction to Python |
|        |         | Introduction to Programming |
|        |         | Variables |
|        |         | Sets and Functions |
| 2      | 7       | Sequences, Sums and Iterations |
| 3      | 12      | Logic |
| 4      | 12      | Circuits and Bitwise Operators |
| 5      | 5.2     | Fundamental Principle of Counting |
|        | 5.3     | Venn Diagrams and Counting |
|        | 5.4     | Multiplication Principle |
| 6      | 6.1     | Introduction to Probability |
|        | 6.2     | Experiments, Outcomes, and Events |
| 7      | 6.3     | Assignment of Probabilities |
|        | 6.4     | Calculating Probabilities of Events |
| 8      | 6.5     | Conditional Probability and Independence |
|        | 6.6     | Tree Diagrams |
| 9      |         | Strings, Lists and Files |
| 10     |         | Matrices, Sets and Dictionaries |
| 11     | 13      | Graphs |
| 12     |         | Number Theory and Cryptography |

The textbook chapter(s) corresponding to the material covered in each lecture should be completed prior to that lecture. Please note: the chapters are not covered in order and there is some material that will be provided by the instructor.

This schedule is subject to revision before and throughout the course.  
Registered students should see the Blackboard Learning System for the latest class schedule.

Important Dates

Dates for adding, dropping the course, etc. are available via: registrar.gmu.edu

Religious Holidays

A list of religious holidays is available on the University Life Calendar page.  Any student whose religious observance conflicts with a scheduled course activity must contact the Instructor at least 2 weeks in advance of the conflict date in order to make alternative arrangements.
Attendance Policy

Students are expected to attend each class (or if the class is online to participate as stipulated by the instructor), to complete any required preparatory work (including assigned reading) and to participate actively in lectures, discussions and exercises. As members of the academic community, all students are expected to contribute regardless of their proficiency with the subject matter.

Students are expected to make prior arrangements with Instructor if they know in advance that they will miss any class and to consult with the Instructor as soon as possible if they miss any class without prior notice. Any student who expects to miss more than one class session is strongly advised to drop the course and take it in a later semester when he/she can attend every class.

Departmental policy requires students to take exams at the scheduled time and place, unless there are truly compelling circumstances supported by appropriate documentation. Except in such circumstances, failure to arrive to the exam site on time for a scheduled exam will result in a score of zero (0) for that exam, in accordance with Mason policy on final exams. Students should not make travel plans or other discretionary arrangements that conflict with scheduled classes and/or exams. If the University is closed due to weather or other unforeseen conditions, final exams may be rescheduled – students are strongly advised not to make plans that would prevent them from attending exams that may be rescheduled during the entire exam period.

Classroom conduct

Students are expected to conduct themselves in a manner that is conducive to learning, as directed by the Instructor. Any student who negatively impacts the opportunity for other students to learn will be warned – if disruptive behavior continues, the student will be asked to leave the course.

Discussion Board communication should be thoughtful and respectful.

Communications

Registered students will be given access to a section of the Blackboard Learning System for this course. Blackboard will used as the primary mechanism (outside of lectures) to disseminate course information, including announcements, lecture slides, homework and other assignments, and scores for homework and exams.

Communication with the Instructor on issues relating to the individual student should be conducted using Blackboard Mail, GMU email, via telephone, or in person - not in the public forums on Blackboard. GMU Mail is the preferred method – for urgent messages, you should also attempt to contact the Instructor via telephone. Federal privacy law and GMU policy require that any communication with a student related in any way to a student's status be conducted using secure GMU systems – if you use email to communicate with the Instructor you MUST send messages from your GMU email account.
Lecture slides are complements to the lecture process, not substitutes for it - access to lecture slides will be provided in Blackboard as a courtesy to students provided acceptable attendance is maintained.

All course materials (lecture slides, assignment specifications, etc) are published on Blackboard in Adobe® Portable Document Format (PDF) or in a format for which a free reader is available (such as Microsoft PowerPoint). This allows users of most computing platforms to view and print these files. Microsoft® Word (or a compatible word processing application) is required for preparing assignments – it is available on computers in the Mason open labs.

Privacy

Instructors respect and protect the privacy of information related to individual students.

As described above, issues relating to an individual student will 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.

Assessable work other than 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.

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 GMU 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. Dean Griffiths has mandated 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 Safe Assign and MOSS – Measure of Software Similarity) 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.

Students may seek assistance with assigned work, (and are encouraged to do so) **provided**:

- 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 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.

\(^1\) Available at [www.gmu.edu/catalog/apolicies](http://www.gmu.edu/catalog/apolicies) and related GMU Web pages.