Information Sciences and Technology Department

Course Syllabus

IT 102 Discrete Structures
(3 credits)

updated 03/15/2019

Catalog Description
Introduces ideas of high-level program design and discrete structures. This course focuses on problem-solving, supporting both abstraction and modeling providing the foundation needed for programming.

Prerequisites
MATH 108 (or MATH 113) is a prerequisite or a co-requisite. Prerequisite enforced by registration system.

This requirement will be strictly enforced. Any student who does not meet the requirement will be dropped from the course at the start of the semester and the student will be responsible for academic or financial consequences of being dropped.

Course Outcomes
1. Students will be able to apply concepts of logic and truth tables to expressions and Digital Circuits. Students will apply Boolean Algebra concepts to create robust selection statements in programs. Students will be able to identify the domain and range of mathematical functions.

2. Students will define and use functions in programs and understand the concept of recursion. Students will implement pre-defined functions by investigating a current language API.

3. Students will be able to identify Arithmetic and Geometric Sequences and determine terms and/or sums of terms within those sequences. Students will select the correct repetition structure and implement iterations in programs.

4. Students will be able to calculate probabilities, permutations and combinations.

5. Students will be able to identify graphs of and plot basic trigonometric functions. Students will be able to simplify expressions using trigonometric identities.
Textbook

Discrete Structures, 3rd Edition
Author: Irene E. Bruno, PhD
Publisher: Pearson
ISBN: 978-1-323-91361-1
Availability: George Mason University Bookstore

Faculty and Staff

Instructor and Course Coordinator:

Irene Bruno
Associate Professor IST Department
Phone: 703-993-8541
Email: ibruno@gmu.edu

Contact and Office Hours: Please contact your instructor via email with any questions you have or to make an appointment. Office Hours are listed on your Blackboard site.

Administrative support:

Fairfax campus
Engineering Building
http://eagle.gmu.edu/map/buildings/engineering.php , Room 5400
Phone: 703-993-3565

Science and Technology campus
Bull Run Hall
Bull Run Hall, Suite 102
Phone: 703-993-3565
Grading

The grading scale for this course is:

<table>
<thead>
<tr>
<th>Percentage Range</th>
<th>Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>99 – 100%</td>
<td>A+</td>
<td>Passing</td>
</tr>
<tr>
<td>92 – 98%</td>
<td>A</td>
<td>Passing</td>
</tr>
<tr>
<td>90 – 91%</td>
<td>A-</td>
<td>Passing</td>
</tr>
<tr>
<td>88 – 89%</td>
<td>B+</td>
<td>Passing</td>
</tr>
<tr>
<td>82 – 87%</td>
<td>B</td>
<td>Passing</td>
</tr>
<tr>
<td>80 – 81%</td>
<td>B-</td>
<td>Passing</td>
</tr>
<tr>
<td>78 – 79%</td>
<td>C+</td>
<td>Passing*</td>
</tr>
<tr>
<td>72 – 77%</td>
<td>C</td>
<td>Passing</td>
</tr>
<tr>
<td>70 – 71%</td>
<td>C-</td>
<td>Passing*</td>
</tr>
<tr>
<td>60 – 69%</td>
<td>D</td>
<td>Passing*</td>
</tr>
<tr>
<td>0 – 59%</td>
<td>F</td>
<td>Failing</td>
</tr>
</tbody>
</table>

* 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>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>10%</td>
</tr>
<tr>
<td>Discussion and Peer Assessment</td>
<td>30%</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>30%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>30%</td>
</tr>
</tbody>
</table>

Notes:

- There are approximately 12 course content modules
- Late assignments are not accepted, for any reason
- Quizzes not taken as scheduled are scored at 0 points
- There are no extra credit opportunities
- Students are required to sit for the scheduled exams
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. While in the spirit of collaboration, students are encouraged to work together on practice problems, homework should be completed without assistance. It is considered an Honor Code violation to post any homework problem or solution on any Internet site or to seek assistance with homework problems from anyone other than an IT102 GTA or an instructor. No late assignments will be accepted for any reason. Students may submit incomplete assignments for partial credit.

**Discussion Board and Peer Assessment Assignments (online sections)**

Every unit has either a Discussion Board or Peer Assessment assignment. These activities are to be completed by the student, with the help of any materials desired (but not other people.) Students are prohibited by the Honor Code to post material that is not their own but not properly cited.

**Exams**

The midterm and final exam will be held as scheduled on the Blackboard site and are held on campus. Online students that are not in the Northern Virginia area may schedule exams to be taken in a proctored environment. Exams will be retained by the Information Sciences and Technology Department 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 (See Blackboard Site for Course Schedule and dates)

**NOTE:** The summer session is accelerated, and the course schedule presented on your Blackboard site requires covering TWO chapters each week.

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Class Content</th>
</tr>
</thead>
</table>
| 1       | Course introduction  
Boolean Algebra  
Logic/Digital Circuits |
| 2       | Truth Tables |
| 3       | Introduction to Programming and Python  
Variables  
Built-in Python Functions  
Algorithms |
| 4       | Set Theory  
Mathematical Functions |
| 5       | Selection: Boolean Expressions and if-elif-else statements in Python  
Iteration: Python while loops  
Algorithms |
| 6       | Counting Principles  
Permutations  
Combinations |
| 7       | Probability |
| 8       | Conditional Probability and Bayes Theorem |
| 9       | Sequences, Sums  
Iteration: Python for loops |
| 10      | Python Functions |
| 11      | Recurrence Relations, Recursion and Mathematical Induction |
| 12      | Introduction to Trigonometry, Trig Graphs and Identities |

The information provided by the instructor corresponding to the material covered in each lecture should be completed **prior to** that lecture. Please note: the chapters may 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](https://blackboard.gmu.edu) for the latest class schedule.*

**Important Dates**

**Dates for adding, dropping the course, etc. are available via:** [registrar.gmu.edu](https://registrar.gmu.edu)
Religious Holidays

Mason values diversity and seeks to create and sustain inclusive learning environments where all are welcome. It is a student’s obligation, within the first two weeks of the semester, to provide the instructor the dates of major religious holidays on which they will be absent due to religious observances. Mason University Life religious holiday calendar.

Attendance Policy

Students are expected to participate as stipulated by the instructor in course activities for each chapter, 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 their 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 (which can be accessed with your Mason login credentials) 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.

On admission to Mason, students agree to comply with the requirements of the Mason Honor Code. 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.

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. Submissions deemed by the instructor to be more than 50% identical to another student’s submission will be submitted to the George Mason University Honor Committee.

- The individual student for this course must newly create all work 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.

Student Services

All Mason students may access the following services:

- Online Education Services, University Libraries
- Writing Center
- Counseling and Psychological Services
- Volgenau School Peer Mentors