

ISAT 252—Programming & Problem Solving—2016 Spring Syllabus

Overview

Welcome to ISAT 252, Programming and Problem-Solving! This course is designed to introduce you to the basics of computer programming and also to the ways that programmers approach problems. “Computational Thinking” is a term coined by Jeanette Wing, Chair of the Computer Science Department at Carnegie-Mellon University. According to Dr. Wing, Computational Thinking:

- is a way of solving problems, designing systems, and understanding human behavior that has become a fundamental part of the way people think and understand the world.
- means creating and making use of different levels of abstraction, to understand and solve problems more effectively.
- means thinking algorithmically to develop more efficient, fair, and secure solutions.
- means understanding the consequences of scale, not only for reasons of efficiency but also for economic and social reasons.

The goal of this course is to give you a new set of tools that will expand your ability to solve real problems for real people.

Schedule and Flow

One of my favorite quotes of all time is:

80% of success is showing up. –Woody Allen

The most important thing you can do in this class is show up and do work. Here’s a great story of what can happen when you do:



From your instructor's viewpoint, **class time belongs to the class**, and we should make decisions together about how it should be spent. In general the use of class time will be fluid. Any given day may be used in the following ways:

- Teams or individuals working on labs independently
- Mini or full lectures delivered by anyone in the class
- Code review sessions, where the class offers feedback on other teams' code
- Status updates or reports by teams or individuals

The schedule for the course will roughly follow the timeline of the semester project.

Week	Date	Topic(s)
1	1/12	Hello, World!; Variables; Comments
2	1/19	Operators; Collections
3	1/26	Decisions; Loops
4	2/2	Strings
5	2/9	Functions
6	2/16	Exceptions
7	2/23	Events
8	3/2	Classes
★	3/9	SPRING BREAK!
9	3/16	Project Idea Development
10	3/23	Writing Project Tests
11	3/30	Project Coding
12	4/6	Project Coding
13	4/13	Project Coding
14	4/20	Practice Presentations
15	4/27	Presentations

Grades

A great deal of research on learning indicates that really [the only good predictor of how much someone will learn is the actual amount of time they spend engaged in learning activities](#). Therefore, here is how the point accumulation system will work.

1 point \approx 1 hour of effort (maybe very approximate)

For financial aid purposes, the federal government considers you to be a “full time” college student if you are taking at least 12 credit hours per semester. That typically represents about 4 courses. A full-time job is typically 40 hours per week, so:

$$40 \text{ hours/week} \div 4 \text{ courses} = 10 \text{ hours/course/week}$$

A semester at JMU is 15 weeks long, so:

$$10 \text{ hrs/course/wk} \times 15 \text{ wks} \times 1 \text{ pt/hr} = 150 \text{ pts/course}$$

In other words, you need to be spending about 10 hours per week on this course to get the maximum expected value. In order to translate points into letter grades, I'll divide 150 by 5, and assign +/- to the top and bottom 9 points of any grade range so to get into the “A” range, you'll need to plan to spend 8-10 hours per week on this course:

Grade	Points
A	129-150
A-	120-128
B+	111-119
B	99-110
B-	90-98
C+	81-89
C	69-80
C-	60-68
D+	51-59
D	39-50
D-	30-38
F	0-29

How will you earn points?

- **Complete badges**

Each badge is designed to be mostly self-contained and to allow you to develop proficiency in a specific skill or set of related skills. I will assign points for each badge and the number of points I assign will be my rough estimation of how long I think it should take you to complete it. Therefore, you can manage your time for any

given week by adding up the number of points in the badges you plan to complete. Most will likely be 3-5 points. More trivial ones may only be 1 or 2 points.

- **Create new badges for your classmates**

I am a big fan of peer teaching and also entrepreneurship. Creating badges is time-consuming for me, and also not that exciting since I already know most of this stuff. If there's a skill or concept you'd like to know and/or that you think your classmates would benefit from, and if there's not already a good badge for it, you can earn points by creating one. I will have to do your badge myself and give you feedback before your classmates can earn points by completing it. You will earn 5 points for creating the badge in addition to the number of points assigned to the badge. As an added bonus, you will earn the privilege of being the person to sign off on and assign points to your classmates who complete your badge.

- **Plan and present a lecture/tutorial for your classmates**

Pick a slice of relevant content and put together a lecture or hands-on tutorial. It should be targeted at anywhere from a 5-minute mini-tutorial to a full 45 minutes and should be clear and hopefully fun. You will need to coordinate with me well ahead of time BEFORE you start working before we schedule it. You can publicize the talks to other sections so that they can attend as well. I may consider awarding extra points for exceptionally well-attended talks. The point range for these talks will be the same as for newly created badges. If they are exceptionally good, I may also award extra points if you go the extra step to record the tutorial in a web-accessible format for future students. [Hint: a good tutorial on how to make high-quality tutorial videos for the web might be a good first lecture for someone to do!]

- **Community/Entrepreneurship points**

You can earn points by doing things that take time, contribute to your own learning, and also make life better for me and/or your classmates. For example, Dr. Radziwill typically selects 3-4 talented people from her classes to be her deputies, and gives them authority to sign off on points for their classmates. Be creative! Wow us. Entrepreneurship is about taking initiative and having follow-through. Community awareness is about having empathy and compassion.

Here are some other things to keep in mind:

- **You can do nearly everything in teams**

I **strongly** encourage collaboration. Keep in mind that regardless of actual effort, everyone in the team will receive all of the points or none of them. That means that if in our post-lab conversation, one of the team members doesn't seem to be up to speed, nobody will get any points until that person is able to demonstrate the same level of proficiency as everyone else. This is to encourage to help each other out with understanding content. [Remind me to tell you the story about the difference between heaven and hell.]

- **Some activities might take longer than the number of points suggests**

While unfortunate, [this is unavoidable](#). If you feel disgruntled by this, then you will feel the same way that thousands of people do every day who are involved in

software projects that have taken longer than estimated. I will not be adjusting the number of points for any of the labs or assignments.

- **There is no partial credit**
- **I don't negotiate points**

I am more than happy to talk about the content, and work with you to overcome challenges you are having. I'm happy to suggest ways in which you might have accomplished a task more efficiently. It is vital for you to understand that the point system is heuristic at best, and completely arbitrary and wildly inaccurate at worst. After all, this is why I have not used a point system in years and developed the [choose-your-own-grade approach](#).

As a final note, I know this point system is not perfect. I have not had any sort of point system in any of my classes in years. It's kind of like Winston Churchill said about democracy ([Churchill by Himself](#), p574):

...it has been said that democracy is the worst form of Government except for all those other forms that have been tried from time to time...

This point system is the best/worst point system, except for all of the other point systems. Please keep in mind that it is your choice to follow the point system, so if you don't think you'll be happy with it, don't choose it.

Personal Integrity

First:

If I catch you cheating, or doing anything else dishonest, you will fail the course. Period.

Second, that being said, ***I strongly encourage sharing and collaboration in most every aspect of the course.*** That means that I think it's a smart idea for you to:

- Download code you find on the web (include the URL of where you found it and some notes about how you got there)
- Download your classmates' code and use it, even before an assignment is due
- Pay someone to help you write code
- Get code from upperclassmen or people in previous semesters
- Ask your neighbor to give you a hint on a question on a test that you're stumped on
- Use whatever notes, websites, books, or other materials you need to complete most any assignment or test

You'll note that many of the above behaviors would be considered "cheating" in many or most other courses. Here are some guidelines I'd like you to follow:

- **Never EVER copy without attribution**
Even on tests, if someone or something helped you out, acknowledge it. Make notes

in your code if you got it from someone or somewhere else. Copying without attribution is stealing and is a breach of integrity. If you got the code off of the web, there should be a URL and some notes about how you found it. If you paid someone to help you write it, say so.

- **Never copy without understanding**

The point of the class is to learn and understand stuff. Since you don't get any grades on individual tests or assignments, it's pretty stupid to copy something that you don't understand. Think about it. What point could it possibly serve?

- **Be very hesitant to copy an ENTIRE project**

While there's a lot to be gained by incorporating parts of your classmates' code in your own project, copying someone else's entire project doesn't really provide you much of a learning experience and wastes people's time.

- **Try to figure it out yourself first**

90% of writing programs is learning how to write them, and this will stay the same throughout your entire programming career. Being a self-sufficient learner is one of the primary goals of the course.

Code re-use is a HUGE part of hacker culture. What hackers hate more than anything is not understanding stuff. I want you to get a sense for what it's like to be a part of the fun world of professional hackers.

Okay, so what do I consider a breach of integrity worthy of failure?

- **Lying about anything to anyone in the class**

It could be as trivial as the reason why you didn't show up for class or do your part of a group assignment. Everybody screws up sometimes. Don't compound the mistake by lying about it. We can forgive mistakes but it's VERY difficult to regain trust once it's broken. Swallow your embarrassment or fear and fess up.

- **Stealing anything-this includes copying without attribution**

Stealing is just wrong, and since you have a blanket license to copy most any code you can find, there's no reason not to give people credit for the work they did. Passing someone else's original work off as your own is frankly disgusting.

- **Threatening, antagonizing, or intimidating anyone in our learning community**

This is unacceptable behavior and will get you at least fired, if not sued in most every company you'd ever work for.

If you are in doubt about something, please ask your prof. Please feel free to come speak to your prof in confidence about anything in this course that troubles you. So far at JMU I've never had a problem with anyone's integrity (that I know about). Don't be the first group to ruin my perfect record. Thanks!

Important Dates and Deadlines

At the behest of the registrar, a list of dates you may wish to take note of:

- Tuesday, January 19th: Last day of add/drop
- Thursday, January 28th: Last day to add a class with Department Head signature
- Friday, January 29th: Last day to withdraw from JMU with charges canceled

So if I scare you off, get out early. Or conversely, if I turn you on, join us soon!

My academic integrity policy is different from JMU's standard policy, but I will adhere to JMU's standard policies listed on the [JMU Syllabus Information for Students page](#) with respect to add/drop, disability accommodations, inclement weather and religious accommodations.

The Prof

My research mainly involves coming up with pedagogical alternatives that maximize student motivation and learning. Being a tech geek, web-based technology plays a pretty heavy role in what I came up with.

My favorite part of my job is getting to hang out with students and play with technology. Feel free to come see me any time. My info:

Office	ISAT/CS 124
Office Hours	Make an appointment
Mobile	973-495-7736 (calls and texts are ok within reason)
Email	bentonmc@jmu.edu
Facebook	http://www.facebook.com/morgan.benton
Twitter	http://twitter.com/morphatic
Blog	http://www.burningmindproject.org

