Name: Rush Sanghrajka
Topical Area: Computer Science
Day and Time of your FIGS class: Tuesday 11:30-12:50pm

AV Checklist

 X Check AV set-up in your classroom under "Classroom Quick Search" at
https://dcs.rutgers.edu/

Does your room have internet access? X Yes   No

Does your room have data projector? X Yes   No

> If not, you will need to reserve any necessary technology at
> https://secure.rutgers.edu/ecs/RequestForm.aspx
>
> You may not exceed 4 requests within the semester.
>
> To reserve a computer lab, go to https://www.nbcs.rutgers.edu/webtools/mrbs/ccf/request.php

Supply Checklist

To request supplies for any class activities, contact Lauren Foster at least one week in advance at
lfoster@echo.rutgers.edu

Chronology Checklist

Exploring Diversity/Multiculturalism should be covered in week 4 or later.

Is your coverage of this topic scheduled during week 4 or later? X Yes   No

The final group project rubric should be handed out and discussed between weeks 5 and 7.

Have you noted the review of your final project rubric during weeks 5, 6, or 7? X Yes   No

Exploring Academic Planning & Requirements should be covered during weeks 7 or 8.

Is your coverage of this topic scheduled during week 7 or 8? X   Yes   No

Requested observation date is noted in your lesson plans (should be lesson where peer instructor is teaching the full class and during weeks 2, 3, 4 or 5).

Is your observation request noted and between weeks 2 and 5? X Yes   No

Back Up Activity: Describe 3 activities you can use at any point in your class. Include purpose of the activity, approximate length of time needed, supplies needed, instructions, and processing questions/answers. Activities should be more significant than icebreakers and topical area connection is preferred. These should be activities that you can do at a moment's notice. If your back-up activities require resources, these resources should be with you at each class.

1. 168 hours activity (20 minutes). This activity helps students to look more closely at how they are spending their time and how they can practice more effective time management as first-year students. The only supplies needed would be copies of the 168hours activity sheets. Students will complete the activity and identify how many hours they have left/are using in their week. I will ask students to share by show of hands ranges of hours left. Questions I will ask are:

   ● Are you surprised by the number of hours you should have free in your week? Why?

   ● If you feel like you do not have as many free hours as the sheet indicates you should have, where do you think you are spending that time?

   ● What could you do to maximize the minutes of your week more effectively?

   Expected responses will be that they are spending a lot of time on social media, hanging out with friends in the residence halls, or not identifying specific times to study so they are distracted while studying and something that should take two hours to complete ends up taking four hours. We will discuss strategies for using time effectively (studying on bus, studying between classes instead of returning to res hall, etc.).

2. **Puzzle: Travelling Salesman Problem (10 mins)**

Supplies: None

This is a well-known complex puzzle in Computer Science, and while it doesn't deal with Databases, it is an interesting research topic. The premise is easy so I intend to discuss it with the students. We draw a map on the board with a few cities and paths connecting them, with the distance. They need to find an "algorithm" which allows a salesman to travel from city A to be in the shortest time. Discussion questions:
   ● Now that we have drawn the map, can you find a path to go from New York to Dallas? What is the distance?

   ● Let's suppose that the salesman needs to travel to five cities, which is the best route he should take?

   ● How much would the result change if we added a new path, or modified the distance in one of the paths?

Expected Responses: To find a path, we simply trace the route from one city to another, and add up their distances. When multiple cities are involved, this becomes trickier. We try to look at the shortest distances and compare them, however, the best route can only be calculated with the help of an algorithm which computes all paths and compares them. On adding a new path or modifying an existing one, **all** minimum distances would need to be calculated once again.

3. Watch video and talk about the important advice! (15 minutes)

Supplies: Video

Video: "Extra Credits- So you want to be a Developer (part 1)"

https://youtu.be/WCuUWGmatpU

Length: 6 mins (the video is a little longer, but the rest is credits)

The video talks about what being a developer in computer science fields means, and what skills are required. It talks about analytical skills, problem solving capabilities, and building a "toolbox". It is a really helpful video full of quick tips.

Activity: Try to recount as many points as you can, because the video is filled with loads of advice. Moreover, talk a little bit about every piece of advice that the students point out, and why they think it is important or not important.

Week ONE, Date: September 13, 2016	

Name of Lesson: Bits and pieces

Objectives:
- Students will be able to classify programming languages based on their uses in computer science.
- Students will be able to solve problems by utilizing algorithmic approaches such as thinking in terms of steps, simplifying using loops, and conditional solving.
- Students will be able to discuss the domains of Computer Science and apply these concepts to understanding the courses in the Rutgers Computer Science Department.
- Students will get an overview of the various domains present in Computer Science.
- Students will get an insight about the startup culture in Computer Science.

FIGS Element(s) covered: Creating a Supportive Learning Environment & Community Building, Career Development, Academic Success (different strategies for learning).

Pre-class preparation *(include technology needs, requests- copies, supplies, computer lab, etc., PowerPoint creation, uploading of article to Sakai, confirming speakers, etc.):*
- PowerPoint presentation on different programming languages and data structures
- Flash cards with topics for the rest of the course and flash cards with definitions
- Basic puzzle pieces for programming problems
- Syllabus printouts
- Questionnaires
- Make CS kits, each one comprising one flash card, puzzle piece, and one questionnaire.

READINGS completed for today as homework OR read in class as short in-class reading assignment (include citation and summary):
- NONE

VIDEOS to be Shown Today OR viewed as homework for today's class (include link, length/section and summary):
- Why Computer Science for Every Child? https://youtu.be/GsagBkLXtRE ,2 min 44 secs.
  This video talks about why computer science is a basic tool that every school must teach and inspires people to gain some level of computer science because of what it can teach one.

ASSIGNMENTS Completed for Today (include title and description of assignment as noted on syllabus):**:**
- NONE

CLASS OUTLINE (Includes opening and closing, discussion questions, expected responses, transitions, clear explanation of how elements are connected to topical areas, clear explanation of connection to Rutgers, etc.)	Resources / Materials Needed:	Timing (i.e. 11:00 am-11:15 am 15 min):
- Play some music while students are walking in, and make sure you hand them the CS kits.		Before Class
- Introduce myself. Talk about my CS story: how I got into CS, what I wanted to do with a degree in Computer Science, moving away from what I wanted, and coming right back to it like doing a full circle. *As a child, I loved storybooks and was crazy about novels. I always imagined being a writer or working with stories someday. As I grew up, I combined my love for stories with my love for games by creating Pokemon-based RPGs at school. The idea of creating these stories and bringing these games to life making it a playable video game got me interested in coding, and I took up Computer Science. However, as I kept pursuing it, the gaming aspect got left out and I moved towards aspiring to become a Computer Engineer, developing applications. I also realized that I liked teaching, and started teaching underprivileged children in middle school. After two years in college, I moved to US and came to Rutgers, where I got a chance to explore other options due to the Core Curriculum by the SAS. This got me back to my interests, and I took courses on Creative Writing. I also got involved in the study group community, and started taking classes in Computer Animation and Graphics. This kind of experience brought me back to my roots, and I figured that I wanted to combine my interests in stories, games, coding and teaching together. And this is what Rutgers offered me: I'm currently working towards going into the computer-generated interactive storytelling field of computer science, and aspire to be a professor in that profession someday! Life came a full circle for me and brought me back to what I wanted from it in the first place.*	- CS Kits	11:30am -11:35am (5 min)
- Play the video "Why Computer Science for Every Child?"	-Video	11:35am- 11:38am (3 min)
- Talk about the video and start a discussion in the class. Make it more of a reflection. **Sample Discussion Topics:** - So, what do you guys feel about this video? Do you guys agree with Partovi? Why/ Why not? **Expected Answers:** Partly agree, as computer science definitely teaches a new way to solve problems. It teaches you to adapt and reach the same solution with different tricks. I've learnt some amazing ways to structure information as well with my Computer Science knowledge.		11:38am -11:45am (7 min)

However, I would point out that a lot of schools do teach computer science now.
- What exactly is the importance of Computer Science? Or, in other words, what made you take this FIGS course?
    Expected Answers:
    It teaches you technology, and today technology is the thing that is evolving faster than anything. People find it hard to switch from iOS to Android, or Snapchatting seems hard for some to get. Learning a little bit about the basics makes you feel connected to how things work, and might even motivate you to go build your own Instagram.
 	
- This video was simply suggesting everyone should study computer science. How many of you studied something relating to computer science? How was your experience studying it?
    Expected Answers:
    Mixed opinions, half of them raise hand... Ask a few of them why they feel in a particular way.
    I personally studied programming in eighth grade as part of an elective course, and a lot of it felt amazing. We built seemingly basic things like calculators but the experience when I built something and it worked was what made me feel amazing about the topic.
 	
<u>Transition:</u>
That's interesting, and I'm hoping you guys are as excited to learn about CS as I am excited to teach you guys. Let's first get to know each other!
 	
<u>Introductions</u>
- Play the memory game around the class with each one introducing themselves, their previous school, why they're interested in taking this class, and end with mentioning something that they like and starts with the same alphabet as their name. For example, "James likes Jellybeans." The next person repeats the previous person's line and adds on to it. <u>Twist</u>: Memory words should start with the same alphabet as the first letter of your name.
		
		11:45am – 11:55am
		(10 min)

- Start the Programming Languages slideshow. Show slides about what programming languages are, show different programming languages, and why they're used.
(Topics cover: database languages, website markup languages, styling languages, programming languages, server side languages).
Have a discussion about decision-making, involving asking around the class questions like:
a. "Tell me the steps you would take to plan a birthday party"
   Expected answers: Logistics such as "buy cake", "invite people"
b. "What decisions did you make?"
   Expected answers: Time, Location, Invitees, Expenses
	Slideshow	11:55am – 12:15pm
		(20 min)

c. Could you make categories of the type of decisions involved? Are they repetitive, or similar? Expected answers: you need to ask similar questions for the same kind of questions. For example, if you have a set of games to be played, you would need to decide the time, requirements and the prizes for *each* of the games in the birthday party. You could group those decision making steps together. Introduce the concept of decision-making, repeating a task and storing values (using the slideshow again). **Transition:** *So now that we have learnt these problem solving skills, let's use them! We're going to do some puzzle solving and build some basic but cool programs today!*		
Bits and Pieces Activity Students open their CS kits and take the puzzle block that they've been given. They team up into teams based upon the colors of the puzzle blocks. Each team is given an exercise to build a computer program using puzzle blocks from the members. **Make sure you hand over extra puzzle blocks in case there are more kits than students.** One group builds a calculator program, another group builds a salary finder program.	Bits and Pieces Question Cards	12:15pm – 12:30pm (15 min)
Exploring the Syllabus Ask the students to open the second piece in their CS kits. The second piece is a card with either a field or a description. **Ensure you show the cards from the extra CS kits.** The students need to find their matching description or field that fits the description. All the pairs make up the topics for the syllabus, and their respective definitions/ descriptions. Distribute copies of the syllabus and go over the syllabus and the course requirements, with the help of the pairs made by the students. Ask students to fill out the short questionnaire, to gauge their interests.	Bits and Pieces Syllabus copies Questionnaire	12:30pm – 12:45pm (15 min)
Closing Revisit the idea of algorithms and problem solving as the core of computer science and its importance in building code. Welcome them to the course once again and collect the questionnaires.		12:45pm-12:50pm (5 min)

Announcements (add in week before lesson):

None at this time.

Readings Due for Next Week (include APA citation and summary):**:**

- None.

Assignments Due for Next Week (include title and description of assignment as noted on syllabus):**:**

- None.

Week TWO, Date: September 20, 2016

Name of Lesson: Do we have a website?

Objectives:
- Students will be proficient with background knowledge of the languages involved in website development.
- Students will be able to modify static webpages built using web markup languages.
- Students will learn the different approaches and features involved in making websites and web applications.
- Students will be able to analyze existing websites by identifying features such as plugins, static vs. dynamic webpages, and hence evaluate the level of interactivity a website has to offer.
- Students will learn about the various services offered to them by the Rutgers Career Services through CareerKnight, including resume builder, job and internship search, and mock interviews.
- Students will be introduced to services provided by the Learning Centers and be able to independently navigate through the Learning Center website to see study groups available, tutoring schedules, and get information about Learning Centers.
- Students will be made aware of the dining services available to them on campus and how to find out more about them.

FIGS Element(s) covered:
Creating a Supportive Learning Environment & Community Building
Career Development (UCS Website and CareerKnight)
Academic Success (Learning Center websites)
Personal Wellness (Rutgers Dining Services /Eating Healthy on campus).

Pre-class preparation *(include technology needs, copy requests, supplies requests, computer lab requests, etc., PowerPoint creation, uploading of article to Sakai, confirming speakers, etc.):*
- Collect big sheets of chart paper and sketch pens from the office.
- Compile a list of features from the following Rutgers websites:
  a. Rutgers Dining Services
  b. Career Services and Career Knight
  c. Rutgers Learning Centers
- Download offline versions of the three websites.
- Download the video.
- Print out copies of the websites mentioned above for distribution among the students.
- Prepare PowerPoint slides for "Website Design".

READINGS completed for today as homework OR read in class as short in-class reading assignment *(include APA citation and summary):*
NONE

VIDEOS to be Shown Today OR viewed as homework for today's class *(include video title, link, 2-3 sentence summary, and length/section. Video length should not exceed 10 minutes):*
- "What is Web Design? The Truth About Websites in 3 Minutes", https://youtu.be/j33Iit-Hbu0
  This video simply briefs up and gives an overview of website design. We will be covering the first five phases of the video during the class. Length: 3 minutes.

ASSIGNMENTS Completed for Today *(include title and description of assignment as noted on syllabus):*
NONE

CLASS OUTLINE (Includes opening and closing, discussion questions, expected responses, transitions, clear explanation of how elements are connected to topical areas, clear explanation of connection to Rutgers, etc.)	Resources / Materials Needed:	Timing (i.e. 11:00 am-11:15 am 15 min):
- **Ice Breaker: Memory Game:** Students go around the classroom reintroducing themselves to each other along with mentioning one website that they like. <u>Twist</u>: At the end, ask students to discuss the mentioned websites among themselves and collectively vote the top three websites (from the ones they mentioned in the memory game) which they think are innovative ideas. To be used towards the website making activity.		11:30am-11:40am (10 mins)
- **Startups:** Introduce the topic for this week in terms of tech startup companies. Talk a little bit about how companies generally make websites. **Transition:** *"So when we decide to form a company and gain some skills, we need to tell people about ourselves! And what reputation does a company have if it doesn't even have its own website?"*		11:40am-11:41am (1 mins)
- **Show video on "The Truth about Websites".**	Video	11:41am-11:45am (4 mins)
- **Discussion:** <u>Question:</u> So, out of the seven phases mentioned in the video, which one would you like to work in? Why? <u>Expected Response</u>: Development, because that's mostly CS related. <u>Expected Response</u>: All of it, because working in a startup means that you are involved in the entire process from beginning to end. Even the designing part of the cycle is often done internally, or with advice from a consultant in case of big projects. <u>Question:</u> How long do you think each phase takes? Which phase is the longest? What do you think it depends upon whether a phase is long or short? <u>Expected Response:</u> Depends on the time remaining for the project to launch, based on the market conditions. Also depends on the number of people involved in the decision-making and development stages. Research projects take a longer planning and design phase.		11:45-11:50 (5 mins)

Question: What phases have you already seen or are aware of? Expected Response: Support and Maintenance is the phase which most of us have seen in day to day life for any product. They're extremely consumer oriented. We may have also seen the planning phase while working on school projects. **Transition:** *"Now that we have gotten a glimpse of the various phases, let's take a look at the computer science behind website development."*		
- **Presentation:** Use the PowerPoint Presentation to guide the class. The presentation slides focus on some basic website development, talking about webpages and going into some basic HTML, and modifying a webpage. I do this by showing them how to use a "What you see is what you get" editing interface to make their website, and then going into the HTML side and talking about the various markup elements. All this will be demonstration. I will then proceed to talk to them about common features used by websites frequently, such as: combo lists, sliders, calendars, hover-over menus and flash media. **Transition:** *"The best way to see what features can be built in websites is to go and look at a few websites! I've got three different Rutgers websites here with varying features for us to observe in class today!"*	PowerPoint Presentation	11:50am – 12:00pm (10 mins)
- **Rutgers Websites Showcase Session** We review some Rutgers websites briefly and look at various features used by websites today and how they function. **Website 1: Rutgers Dining Services** Talking Points: a. Static Webpages: used mainly for information purposes b. Navigation tabs: Easily displays all subtopics the website has to offer. c. Places to eat tab: Static image with animated icons used to show different campus links. (Talk about popular places on each campus while showing the webpages, asking students which of the places they've been to so far). d. Informative website: Pages displaying restaurants that accept RU Express. **Website 2: Rutgers Learning Centers (all three)** Talking Points: a. Not entirely static anymore: More regularly updated because of events and spotlight.	The three websites Handouts	12:00pm- 12:20pm (20 mins) (5 mins) (10 mins)

b. Students can sign up for tutoring/ academic coaching: talk about the services offered.
   c. Access Tutoring Schedule: Tables used
   d. Forms: Student Request forms/ contact us forms.
 	
Website 3: Rutgers Career Services
<u>Talking Points:</u>
   a. Give a brief overview about Career Services with the help of their website.
   b. Show the events calendar and talk about that. Calendars are common features observed in websites.
   c. Talk about the main feature: a log in system, to log into Career Knight.
   d. Talk about Career Knight's features
   e. Show job listings, and talk about consumer websites, and how important filtering and searching is in websites like these.
   f. Show them the Documents Feature, where we can upload resumes.
   g. Demonstrate Mock Interviews, talking about Flash Players in websites as plug-ins.
		(5 min)

- Build a Startup Website
Students group together into three teams and each of them gets one of the three decided themes (from the Icebreaker Memory Game in the beginning of the session). They have to come up with their own website with the following:
   a. List of features : ANALYSIS
   b. Website Design :PLANNING
   c. Show three sample pages : DESIGN
	Chart Paper
	Colored Pens
		12:20pm -12:35pm
		(15 mins)

- Present your Website Students present their website to the entire class in turns. **<u>Closing</u>** *So now that we have learnt what exactly happens in website development, this should give you guys a perspective about what goes into web design and web development. Next week we will look at the other technical aspect used often by websites: databases.* *Websites that we just saw need to store this information in a manner which is easily accessible, and databases serve that purpose. You'll actually get a tiny glimpse at databases when you perform the assignment that's due next week: RIOT. RIOT is a tutorial that teaches you research skills, and some of it revolves around picking the database and searching for the right things, which will be a vital thing to know when we cover databases next week. See you guys next week!*		12:35pm-12:45pm (10 mins) 12:45pm – 12:50pm (5 mins)

Announcements *(add in week before lesson):*
Readings Due for Next Week *(include APA citation and summary):* NONE
Assignments Due for Next Week *(include title and description of assignment as noted on syllabus):* RIOT Assignment (10 points) Complete all 5 modules of the RIOT (Research Information Online Tutorial) which can be found at http://www.libraries.rutgers.edu/rul/lib_instruct/riot/. Following completion of all 5 modules, print out certificate of completion to bring to our FIGS class. **It is recommended to take a screen shot prior to printing to avoid possible technical glitches.**

Name of Lesson: Deal With Thy Databases

Objectives:

- Students will be able to read basic SQL and understand SQL commands used for database tasks.
- Students will be able to participate in discussions about common problems and challenges that occur in the database domain.
- Students will be introduced to the RU Libraries website, and will learn about research and how to go about researching in the field of Computer Science.
- Students will be able to talk about some classic problems in Computer Science, and will learn some approaches towards it using research skills.

FIGS Element(s) covered: Creating a Supportive Learning Environment & Community Building, Information Literacy (RIOT and processing Information Literacy).

Pre-class preparation *(include technology needs, copy requests, supplies requests, computer lab requests, etc., PowerPoint creation, uploading of article to Sakai, confirming speakers, etc.):*

- Create PowerPoint slides for the following topics:
  a. SQL
  b. Databases
  c. Visuals for Barber's Problem, Travelling Salesman, Towers of Hanoi, and Dining Philosophers.
- Assemble Tower of Hanoi piece by finding different sized stackable objects.
- Print out copies of the SQL Quiz webpage to distribute.
- Bring forks for the Dining Philosopher's problem.
- Print out copies of Content Literacy and Information Literacy Quiz

READINGS completed for today as homework OR read in class as short in-class reading assignment (*include APA citation and summary*):

- SQL Quiz, http://sqlzoo.net/wiki/SELECT_Quiz
  A webpage that we will access for students to test their SQL skills.

- Content Literacy: A Brief Introduction.
  This is a brief document provided as reading in Pedagogy Fall 2015 (for the Learning Assistant Program). There is no link, I'm attaching the document along with the syllabus.

- Information Literacy Tutorial:
  https://content.sakai.rutgers.edu/access/content/group/8911c2fc-3cba-4e30-ac47-211e2573f355/Assigned%20Readings/Week%206%20-%20Content%20Literacy/Information%20Literacy%20Tutorial.pdf
  This is a short pop quiz which asks general questions about the do's and don'ts of information literacy. This was once again part of the course readings for Pedagogy Fall 2015.

VIDEOS to be Shown Today OR viewed as homework for today's class *(include video title, link, 2-3 sentence summary, and length/section. Video length should not exceed 10 minutes):*

None

ASSIGNMENTS Completed for Today *(include title and description of assignment as noted on syllabus):*

RIOT Assignment (10 points)

Complete all 5 modules of the RIOT (Research Information Online Tutorial) which can be found at http://www.libraries.rutgers.edu/rul/lib_instruct/riot/. Following completion of all 5 modules, print out certificate of completion to bring to our FIGS class. **It is recommended to take a screen shot prior to printing to avoid possible technical glitches.**

CLASS OUTLINE (Includes opening and closing, discussion questions, expected responses, transitions, clear explanation of how elements are connected to topical areas, clear explanation of connection to Rutgers, etc.)	Resources / Materials Needed:	Timing (i.e. 11:00 am-11:15 am 15 min):
Introduction Welcome the class, collect the RIOT assignment printouts. Inform the students about how today's class will go, and make sure everyone is logged in and has a computer to work with.		11:30am-11:32am (2 min)
SQL Use the PowerPoint presentation to explain to the students what databases are. Use the example of Universities (from SQLZoo) as a database and travel through the databases, asking students to add data from the other classes they're taking at Rutgers as entries to the database.	PowerPoint Presentation	11:32am-11:40am (8 min)
Exercise with SQL Students will look at exercises on the SQLZoo website, and then collectively solve the pop quizzes together. While the semantics and syntax of SQL is not the focus, understanding the concept is key. This will be more of an interactive session, where students volunteer to solve a specific problem by verbally answering the query.	SQLZoo website printouts	11:40am-11:50am (10 min)
Databases Students will get a short top level overview on database systems: their implementation, file based databases vs. table based databases, and applications. The PowerPoint will focus more towards what are some problems with database systems: namely deadlocks and synchronizations.	PowerPoint Presentation	11:50am-12:00pm (10 min)
Transition *In order to better understand the kind of problems that we come across, let's have an interactive activity and see the kind of problems that can occur with database systems!*		
Puzzle: Sleeping Barber's Problem The Barber's Problem is a popular computer science theory, with the context being a case where the barber alternates between giving customer haircuts and sleeping, and the customers either waking up the barber to give them a haircut, or waiting in the waiting room if the barber is attending to other customers. This problem is a classic example of synchronization issues, which are common problems with databases.		12:00pm-12:10pm (10 min)

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I intend to do this topic with students by having half of them enact it, and then have an interactive discussion about the possible problems. Problems: Deadlock and starvation Solution: Synchronization and locks	Forks	12:10pm-12:20pm (10 min)
Puzzle: The Dining Philosophers This is another common puzzle in the Computer Science world. The problem talks about a group of philosophers sitting on a round table, alternating between eating and thinking. This is a classic example and deals with locks. I intend to do this topic once again with some students enacting the scenario. In this scenario, it is easy to spot the issue where a deadlock is created, however, it will be interesting for the students to fix the deadlock by brainstorming a solution here. I will tell the students that the solution to this problem will be covered later in Week Four. **Transition** *So now that we know a few challenging problems, in Computer Science, it is often helpful to know how to look for resources in academia to look at different approaches to the problems. In Rutgers SAS/SEBS too, you'll come across a lot of classes which will have a research component to it as well, so let's go on and see what research in computer science is about!*		
Research Skills and Information Literacy Use the RU Libraries page and navigate to different databases, showing students how to search for documents and access various documents. Talk to the students how to approach research papers in Computer Science and other Science fields. I talk about the different parts of the research paper, and how to read them and understand them better. Students are encouraged to relate what they learnt in the RIOT tutorial with content literacy and information literacy.		12:20pm – 12:25pm (5 min)
Distribute the Content Literacy handout and talk about it. In the end, pass on the Information Literacy Tutorial and ask students to discuss among themselves on what the answers should be. Talking points: - Scholarly journals: how useful are they, and how to find them - Internet articles: authenticity vs. readability - Going to the library vs. research online	Content Literacy Handouts Information Literacy Quiz Handouts	12:25pm – 12:35pm (10 min)
		12:35pm-12:40pm

		(5 min)

Discussion Questions:
1. How can you relate this to the RIOT exercise that was assigned to you for this week? Are we learning something that the RIOT tutorial touches upon?
    Expected Answers: Being specific in research, authenticity of internet articles, and narrowing the question are things that the RIOT tutorial also talks about.
2. Why are citations necessary?
    Expected Answer: Citations give the reader information about where you are getting your facts from. If the reader would like to find out more, they have some kind of reference to look up and learn more about a particular topic.
3. Why do you think research papers are important in Computer Science, as compared to, for example, information manuals or textbooks?
    Expected Answer: In computer science, whenever a new technology is discovered, it is necessary to document the approaches taken, even if some of them were only partially unsuccessful, in order to let future researchers know what all has been attempted in the particular domain. Information manuals list the features and the accomplishments of a technology, while the research article can talk about the various attempts and challenges in implementing the new technology.		

Puzzle: Towers of Hanoi I use this puzzle as a brain teaser for students, where I introduce the Tower of Hanoi and allow students to solve the problem of moving around blocks from one tower to another using only one block at a time and placing a smaller one on a bigger one at all times. This is a fun activity while it still tackles a computer science tactic used very often: recursion. We'll talk about how recursion (which means breaking a problem into smaller problems of the same sort) works and can be used to solve this puzzle. **Closing** So today we did quite a lot! We went from databases and looked at various problems with them, to other problems in the Computer Science domain. We also went over how to do research in the domain, which will be really important when we look at the final project for this class!	Towers of Objects	12:40pm – 12:50pm (10 min)

Announcements *(add in week before lesson):*
Readings Due for Next Week *(include APA citation and summary):* None
Assignments Due for Next Week *(include title and description of assignment as noted on syllabus):* **None**

Week FOUR, Date: October 4, 2016
Name of Lesson: Inside the Box and Out There in Society: Systems

Objectives:

- Students will be able to gauge various system specifications and understand the terminology.
- Students will be able to understand what goes into building an operating system, and the functions performed by an operating system.
- Students will be able to learn about the diversity in Rutgers, and how to respect people with different cultures.
- Students will be able to have a debate with their peers on system requirements and operating systems.

FIGS Element(s) covered: Creating a Supportive Learning Environment & Community Building, Diversity and Multiculturalism (Study Abroad and LGBTQ)

Pre-class preparation *(include technology needs, copy requests, supplies requests, computer lab requests, etc., PowerPoint creation, uploading of article to Sakai, confirming speakers, etc.):*

- Prepare place-cards for dividing the class into two groups based on the debate topics.
- Take sticky notes for the icebreaker activity.
- Go to the CAVE and collect hardware parts to show students: objects such as modems, condensors, hard disks, CD drives.
- Print out pictures of different hardware parts.
- Print copies of "Language Matters" flyer.
- Purchase candy to give to members of the winning team for the debates.
- Download the Ted Talk Video offline.

READINGS completed for today as homework OR read in class as short in-class reading assignment *(include APA citation and summary)*:
 None.

VIDEOS to be Shown Today OR viewed as homework for today's class *(include video title, link, 2-3 sentence summary, and length/section. Video length should not exceed 10 minutes):*
- **"Valerie Hoaeks: Cultural Difference in Business", https://youtu.be/VMwjscSCcf0**
 This video talks about the journey of experiencing a foreign culture and ties in with the abroad study program I want to talk about. 10mins (0:00 to 2:27, 4:04 to about 12:00)

ASSIGNMENTS Completed for Today *(include title and description of assignment as noted on syllabus):*
None.

CLASS OUTLINE (Includes opening and closing, discussion questions, expected responses, transitions, clear explanation of how elements are connected to topical areas, clear explanation of connection to Rutgers, etc.)	Resources / Materials Needed:	Timing (i.e. 11:00 am-11:15 am 15 min):
Systems: It's different inside the box Introduce the class to what systems are. Go around asking people what their interpretation of the word "System" means. Build towards the computer science definition of the term, and talk about what happens in systems programming. Talk about what parts of the computer science field does Systems Software concern: Operating Systems (**privileges** and file management: which includes dealing with deadlocks/ philosopher's problem), Stack Development (which is how operating systems are built), and Cybersecurity. **Discussion** **Question**: What, according to you is a system in Computer Science? Could we form a definition? **Expected Answer**: Operating system, something that can run your computer mobile phone. System basically means a set of interdependent components acting together in a way to make the machine function. **Question**: What should the functions of an operating system be? **Expected Answers:** To allow the user to perform the functions necessary. To allow the device be run in a good condition. To allow the user to add more features and customize the device based on his needs. **Question**: What systems do you guys think are great operating systems for your phone or tablets? Why? **Expected Answer:** Varied answers, with most people describing why they like their Operating System. **Question:** What according to you is an important thing you learnt from Cybersecurity? **Expected Answers:** Varied answers, example: I personally learnt about being cautious about the amount of information I share on my social networks, and how easy it would be for someone to hack my account using that information. **Transition**		11:30am-11:40am (10 mins)

Now that we have a basic idea about what systems are, let's look at some hardware objects, and learn more about it! Because afterall, systems heavily serve as a connection between hardware and software!		
Show and Tell Distribute the hardware objects around for students to see. (Use pictures as back up incase objects are not available). Students can talk about what they know about the objects, and then I go over what each of them is used for as well. **Transition** *Okay, now let's take some time to see what you grasped! Let's play a game!*	Hardware objects taken from CAVE Printouts of images of various parts in a computer	11:40am-11:50am (10 mins)
Icebreaker This is a common icebreaker activity: each person has a word (one of the hardware objects) on the post it at their back, and they need to go around finding the partner with the same word. The catch here is that they can only ask other people what they are with yes/no questions based on what the object does. **Transition** *Now that we have all moved around a bit, and learnt about common hardware objects, let's learn more through having a debate!*	Post it notes	11:50am-12pm (10 mins)
Debates The purpose of this section is to get students to be able to converse on topics related to technology, which is a skill necessary irrespective of their major. The students will be given sides based on their partners in the ice breaker activity (post-it notes will have numbers, even numbers and odd numbers take opposite sides). I'll talk a little bit about each topic, and then let students plan their points, and the last ten minutes will be the debate. Topic: Apple vs. Google (Apple products are more closed to the user, stronger privileges and less customizability for developers, while Google products have lower privileges and allow developers to develop applications to use the features of the Operating System more openly). **Transition** *Today's class is not just about the systems inside computers. It is also about systems around us. So, in Operating Systems, there is an important concept that privileges that we saw today: every file has different privileges: read, write and access. Let's look at privileges that we have in society as well.*	Debate place cards Candy for the winners	12:00pm-12:20pm (20 mins)

Cultural Competency: A Discussion about Diversity		12:20pm-12:50pm (30 min) BROKEN DOWN TO:
Talk about different cultures in society, especially a diverse society like Rutgers. Talk to students about how the Computer Science field has people from all over the world coming together: mention my internship experience working with people from Germany as an example.		(5 mins)
Show the video on Cultural Diversity.	Video	(10 mins)
Use the video to talk about what the students feel about different cultures and use it as segue to build towards cultural diversity. **Discussion:** Question: What other cultures do you all personally wish to share about, based on this video? Answer: Varied, depending upon students' backgrounds. I personally come from a metropolitan city in India, and my culture makes me seem a bit loud compared to New Jersey culture I feel. Question: What part of the video really stood out to you? Answer: Personally, what stood out to me is the concept of owing people favors. I was not aware of this concept in Chinese culture and I wish had I known it before, I may have actually kept that in mind while interacting with my Chinese friends. Moreover, this same concept applies to other cultures as well, and we should make sure to interact in a manner which doesn't hurt anyone else.		(10 min)
Mention the Asian American Cultural Center as another community to go and check out, tell the students what if offers. Pass around the "Language Matters" flyer and use it to talk about the Centre for Social Justice and LGBT. Mention the fact that even though these communities may focus on certain groups, they welcome everyone and it is great to just visit them and sit and talk with them. The AACC even has cool events such as the Moon festival which is a great attraction for non-Asian students on campus. Asian American Cultural Center: http://aacc.rutgers.edu/	Language Matters Flyer	
Come back to the video and ask students how they felt about the idea of going to China or any other foreign country to study. Talk to students about Study Abroad options at Rutgers to go outside and see how other systems work. **Discussion:**		(5 mins)

Question: So what do you think is the benefit of a study abroad program? Expected Response: It gives you an insight into the culture of other communities. It sort of helps you to see the big picture, by seeing other customs, and an entirely different world. Some Study Abroad Programs offer you a better community to learn, such as learning French in France or studying Art in Rome. Question: Where would you like to go if you wanted to do a study abroad program? Why? Expected Response: Varied responses, based on people's personal opinions. I personally would like to go to Germany to study automobile engines and how they work. Question: What do you think are the benefits of a study abroad program, or joining a multicultural community back home? Why? Expected Response: A multicultural community back home would give you expose to different communities at the comfort of your home, and it is a financially viable option. A Study Abroad program does however, completely immerse you in the new culture and that may be an experience which is arbitrary: depends on person to person. Question: Since we are talking about multicultural communities, how can we make sure that we aren't hurting anyone with our words or actions? Expected response: Various responses from students. One way to do this is to implement the oh, oops and ouch policy. (Explain the policy). End the class with telling the students that it's a great opportunity to get to know how other systems work and they should use their time at Rutgers to do the same.		

Announcements *(add in week before lesson):* None
Readings Due for Next Week *(include APA citation and summary):* None
Assignments Due for Next Week *(include title and description of assignment as noted on syllabus):* *None.*

Week FIVE, Date: October 11, 2016

Name of Lesson: B1G D/\T/\

Objectives:

- Students will be able to look at career options present in the industry with a major in Computer Science, such as software development, database administration, QA and testing, training in new technologies, cybersecurity, infrastructure and systems administration, and research in new technologies.
- Students will be able to utilize the concept of data structures and a few algorithms that use data structures.
- Students will be able to define Bigdata, its importance of the domain in the industry today, and the challenges faced in this field.
- Students will be able to recognize various health issues popular while working in an office environment and learn how to deal with them.
- Students will be able to find services offered on campus by Student Health Services, such as CAPS, HOPE, and the various Health Centers on campus.

FIGS Element(s) covered:

Creating a Supportive Learning Environment & Community Building
Personal Wellness (Eating Healthy, Recreation Services, Health Centers).
Career Development (Specific career opportunities in Computer Science).

Pre-class preparation *(include technology needs, copy requests, supplies requests, computer lab requests, etc., PowerPoint creation, uploading of article to Sakai, confirming speakers, etc.):*

- Get handouts from University Career Services (Career Services kit)
- Get handouts from Student Health Services (Health Services kit)
- Prepare PowerPoint presentations for data structures, algorithms and bigdata.
- Prepare materials for the activity on big data processing.
- Purchase candy for today's class.
- Carry colored balls for picking teams
- Carry sheets with sequences of 1's and 0's.

READINGS completed for today as homework OR read in class as short in-class reading assignment (*include APA citation and summary*):
None.

VIDEOS to be Shown Today OR viewed as homework for today's class *(include video title, link, 2-3 sentence summary, and length/section. Video length should not exceed 10 minutes):*

"What is Big Data and how does it work?", https://youtu.be/TzxmjbL-i4Y
An introduction to BigData, and more importantly why big data is being used, and what factors lead to it being known as bigdata. 1 min 33 sec

ASSIGNMENTS Completed for Today *(include title and description of assignment as noted on syllabus):*
None.

CLASS OUTLINE (Includes opening and closing, discussion questions, expected responses, transitions, clear explanation of how elements are connected to topical areas, clear explanation of connection to Rutgers, etc.)	Resources / Materials Needed:	Timing (i.e. 11:00 am-11:15 am 15 min):
- This Week *"Now that we have learnt design, decided features while making products, done research, talked about databases and programming languages, let's look at larger and more specific topics".* Also use this time to talk about B1G being a reference to Rutgers being a part of the B1G 10 and how it benefits the University: access to resources from the B1G 10 university libraries, more funding for research, recognition in sports.		11:30am-11:35am (5 min)
- Data Structures and Algorithms Go over some basic and valuable data structures used to store information, and some smart ways to access them, with the help of some algorithms. The Data Structures I talk about are: 1. Arrays, 2. Linked Lists, 3. Trees, 4. Graphs. The smart ways I talk about to access them are 1. Binary search for arrays 2. Sorting on Arrays using Tree Sort 3. Soring on arrays using Insertion Sort. 4. Graph traversal algorithms. **Transition** *"Now that we have learnt the basics, we start looking at domain specific topics. These topics are specialized, and most companies heavily rely on such domains to work Now, since we are talking about big companies, it is important to look at major health problems while working, since working in a corporate environment is different from the Startup culture and can be stressful!"*	PowerPoint Presentation	11:35am-11:50am (15 min)
- Health and Stress Talk about the main health issues seen in people working in the IT industry in the recent years. 1. Obesity: Due to sedentary lifestyle of programmers, they have a desk job and end up losing out on exercise, or not eating healthy food. Introduce the dining services and the Recreation Centers on Campus as valuable resources to stay healthy, and talk about them. 2. Stress and Pressure: Due to work-pressure. Introduce HOPE, Counseling and other services offered by Student Health Services.	Health Services Kits	11:50am-12:05pm (15 min)

3. Carpal Tunnel Syndrome: Caused because of keyboard typing, pinching of nerves in the wrist. Talk a little bit about it, and introduce the Rutgers Health Centers on campus and them being a really valuable resource if anything happens to students or if they need primary care. **Transition** *Now that we know how to take care of ourselves, we can successfully devote our time to do productive work! Let's also look at the kind of work we do in big corporate companies!* - **Careers in the Industry** Talk about career opportunities that students can have with a major in Computer Science. List a few of them and have a discussion with students about what they think about careers in the Computer Science field. For each career, talk about the kind of work involved, and its scope in the industry. List of Careers: 1. Software Developer- front end, 2. Software Developer- back end, 3. Database Administrator, 4. QA and Testing, 5. Training in new technologies, 6. Cybersecurity Analyst, 7. Infrastructure and Systems Administrator, 8. Researcher in new technologies.	Career Services Kits/ Booklets PowerPoint Presentation	12:05pm -12:15pm (10 min)
Introduce UCS goals for first year students. Show the four year plan by the UCS and spend a few minutes talking to students about choosing a major and taking self-assessments to see what one likes. Move on to show them opportunities on Career Knight. Show them the steps that they should take in their freshman year regarding careers. **Discussion Topics:** Q: "So, what job do you think of working when you think of yourself as a graduate in computer science? Describe the perks!" Expected Answers: "Doing cool stuff everyday" "Similar to Silicon Valley" "Working a normal desk job which pays well" Q: What kind of a work schedule do you imagine yourself in a computer science profession? Expected Answers: "Is there travel involved?" "Working from home would be cool" "Working flexible hours is cooler since you may have teams internationally located!"		12:15pm- 12:30pm (15 min)

Q: Which job opportunity sticks out to you from the one we discussed? Why? Expected Answers: Open ended question- varied responses. To me, QA and Testing is an interesting option as it has a different feel to it. It is for those who are interested in technical things but also would like to pursue something which needs business skills.	PowerPoint Presentation	
Transition *Now that we have seen the various career opportunities in the professional domain, let's start looking at topics in computer science that tie in to specific domains; topics which are advances and are the "buzz" in computer science currently. And since today we have been going over data, let's turn towards BigData!*		
- **Bigdata** Bigdata is one of the domains of Computer Science, often an advanced domain which needs specialization or graduate school. I introduce the students to what it is and give a brief overview, basically demonstrating what is typically done in this field of computer science. I use a simple video to talk about bigdata and the challenges and applications. This is very brief as students have already seen data and databases in Week Three ("Deal with thy databases").	Video	12:30pm- 12:35pm (5 min)
- **Understanding Bigdata** This is a collaborative exercise. Students form teams (with colored balls), where each team comprises of Database Administrators, Software Testers, and Analysts. The Software Testers start speaking in sequences of 1s and 0s, the administrators try to capture all the data correctly, while the analysts analyze the data, counting the 1s and 0s, and tracking which person do they belong to (the students are saying the 1's and 0's based on a sheet I've prepared and given to them). They use techniques from the data structures learnt in the beginning of today's class. The logic here is basically to explain to the students that this is the speed and the volume of data input generally observed in the case of bigdata, and the students come up with their own way to become efficient in recording it and analyzing it. Importantly, the students can start using tactics such as sorting the 1's and 0's as soon as they come in. (This is called bucket sort, which we saw earlier in the lecture). This will form an important part as reflection, as students reflect upon how the simple activity can connect to bigger ideas such as Twitter feed coming in quickly and so on.	Balls for picking teams Prize for winning team	12:35pm -12:45pm (15 min)

Closing **Question:** So today we dealt with Bigdata. Can any of you connect this with our Week Three lesson on databases? **Answer:** Bigdata is technically amplification of the problems that we saw previously with databases. The activity we just played is one more example of large scale synchronization issues. **Question:** We also saw a few careers in the CS industry today. Which ones stuck out to you from the ones we looked at? **Answer:** Varied responses. Example response: Database Administrator is one of the careers we saw in the discussion as well as right now during the activity on bigdata. **Question:** We also looked at Health and Stress today. Looking at the activity that we performed right now tells us that this would be quite a stressful one in real life. How would you tackle the kind of stress from such a task? **Answer:** Scheduling breaks is important in such a task, where the participants can switch in order to take rest. Having great sleep and diet is also important to keep functioning longer in such strenuous activities!		12:45pm – 12:50pm (5 mins)

Announcements *(add in week before lesson):* None.
Readings Due for Next Week *(include APA citation and summary):* None.
Assignments Due for Next Week *(include title and description of assignment as noted on syllabus):* **None**

Week SIX, Date: October 18 2016
Name of Lesson: Offshore Consultants
Objectives: - Students will be able to visit the CAVE (Collaborative Academic Versatile Environment), a lab in the CS department which acts as a hub for CS majors. - Students will be able to gain information about various Computer Science Clubs in Rutgers, such as USACS and WCS among many others. - Students will be able to interact with other students in the Computer Science community.
FIGS Element(s) covered: Creating a Supportive Learning Environment & Community Building, Out of Class Excursion, Involvement & Peer Perspectives.
Pre-class preparation *(include technology needs, copy requests, supplies requests, computer lab requests, etc., PowerPoint creation, uploading of article to Sakai, confirming speakers, etc.):* - Confirm participants for the Peer Panel session. - Send out email to students reminding them about the Excursion and the meetup spot. - Print out copies of the rubric for final year project.
READINGS completed for today as homework OR read in class as short in-class reading assignment *(include APA citation and summary)*: None.
VIDEOS to be Shown Today OR viewed as homework for today's class *(include video title, link, 2-3 sentence summary, and length/section. Video length should not exceed 10 minutes):* **None.**
ASSIGNMENTS Completed for Today *(include title and description of assignment as noted on syllabus):* **None**

CLASS OUTLINE (Includes opening and closing, discussion questions, expected responses, transitions, clear explanation of how elements are connected to topical areas, clear explanation of connection to Rutgers, etc.)	Resources / Materials Needed:	Timing (i.e. 11:00 am-11:15 am 15 min):
EXCURSION Location: The CAVE, Located in CORE, in the Busch Campus. Meetup spot: The CORE Bus stop in the Busch Campus. Host: A Member from USACS, possibly Jamie Liao Contact: rutgersusacs@gmail.com (Jamie can be reached at this email) Status: Confirmed. Today, I take the students to the Computer Science department, and show them the resources and help available to them in the Computer Science community. I first take some time to talk to the students about the department, giving them an overview and an overall idea of the department, while we make our way to the CAVE.		11:30am-11:40am (10 mins)

The CS Clubs of Rutgers
I take them first to the CAVE, and talk to them about various CS clubs, such as:
   - USACS (Undergraduate Student Alliance of Computer Scientists) - confirmed
   - WCS (Women in Computer Science)
   - RUMAD (Rutgers Mobile App Development)
   - COGS (Creation of Games Society)
   - RU Autonomous - confirmed
(I'm currently in talks with several of them to work out if they can be present in the CAVE).
USACS will be talking about a mentorship program especially for freshmen students interested in Computer Science.
One representative from RU Autonomous will also be present to talk about their club personally.
		11:40am-12:05pm (25 mins)

A Demo from HackRU In this segment, members from USACS talk about HackRU, and conduct an activity with the students showing them projects from HackRU participants. This will be more of an interactive session, where the students can ask questions and will learn about cool things built by CS students. RU Autonomous has confirmed that it will bring some of its projects for demo as well for the students.		12:05pm – 12:20pm (15 mins)
Final Project Rubric	Rubric	12:20pm – 12:25pm (5 mins)

I take a few minutes to talk about the Final Project, and distribute the Rubric, so that students can start thinking about the Final Project now that they've seen the different resources in the CAVE. **Peer Panel** There will be a peer panel within the CAVE itself (confirmed), where students can talk to seniors. I am currently in talks with the members, but as of now these are the list of tentative members: 1. Tanya Balaraju: Computer Science Major, Junior Year. Committee Member of USACS and member of Women in Computer Science. Unconfirmed. 2. Daivik Sheth: Computer Science Major, Senior Year. Interned at Verizon for two summers. Confirmed. 3. Aditya Geria: Computer Science and Mathematics major, Senior Year. Education Director in COGS, committee member in USACS. Unconfirmed. 4. Dylan Herman: Computer Science Major, Senior Year. Acting President for Cyber Knights, and team lead of RU Autonomous. Confirmed. 5. Nidhi Desai: Computer Science Major, Junior Year. Interned at JPMorgan Chase. Unconfirmed. These are tentative, they may change based on the clubs sending different people. List of questions for Peer Panel: 1. What would your top advice be for CS students in their freshmen year? 2. Where did you gain the most experience and knowledge from? What activities or events motivated you? 3. What part of Rutgers do you like the most? 4. What were your fears when you came to Rutgers? 5. Share an interesting moment in Rutgers that defined your life in your opinion. 6. How hard is it to get an internship? What was your internship experience? 7. How does being part a club help you academically, or outside of academics? What skills do you think you gained from your experience being part a CS club? **Closing** So to wrap things up, today's class was more about you discovering what Computer Science has to offer you. This session helped you explore the community, see clubs and their projects, as well as give you		12:25pm-12:50pm (25 mins)

other insights into the major that I may not have been able to give you. Hope that the amount of stuff we did today gives you a lot of things to think about for your final project!		

Announcements *(add in week before lesson):*
None.

Readings Due for Next Week *(include APA citation and summary):*
None.

Assignments Due for Next Week *(include title and description of assignment as noted on syllabus):*

Event Reflection (10 points): Attend an event on campus that is connected to your FIGS topical area or academic success. Provide a summary of the event. What did you learn? What did you enjoy most about the event? How will this information learned help you as a student? The event must be approved by instructor prior to attending.

Final Group Project Topic
The final project must involve conducting a literature review of research done in a specialized domain of Computer Science, and must tackle a sort of challenge in the domain. The final project must talk about the importance and implications of the challenge, along with approaches used in order to overcome the challenge. The project must also focus on what kind of results, if any, have been observed, and how solving or approaching the problem has helped the domain.

Week SEVEN, Date: October 25 2016

Name of Lesson: Corporate Culture- Intricate Planning

Objectives:

- Students will be able to explain the software development life cycle and its stages, a vital concept for working in large corporations.
- Students will be able to gain an insight into the culture in corporate companies, and the do's and don'ts of corporate culture.
- Students will be able to access WebReg and navigate their way through other important websites necessary for academic planning.
- Students will be able to understand the academic degree requirements for the School of Arts and Sciences.

FIGS Element(s) covered: Creating a Supportive Learning Environment & Community Building, Academic Planning and Requirements.

Pre-class preparation *(include technology needs, copy requests, supplies requests, computer lab requests, etc., PowerPoint creation, uploading of article to Sakai, confirming speakers, etc.):*

- Confirm with Academic Dean about the location and time of the academic planning session, and the topics to be discussed.
- Print out copies of the reading.
- Carry posters and marker pens for the Learning Circles Activity.
- Download the two videos for offline viewing.

READINGS completed for today as homework OR read in class as short in-class reading assignment (*include APA citation and summary*):
SDLC - Quick Guide. (n.d.). Retrieved June 28, 2016, from
http://www.tutorialspoint.com/sdlc/sdlc_quick_guide.htm
This is a guide to the SDLC process, an essential concept in Software Development.

VIDEOS to be Shown Today OR viewed as homework for today's class *(include video title, link, 2-3 sentence summary, and length/section. Video length should not exceed 10 minutes):*
- **Culture Inside Google, https://youtu.be/c1jlmdkApTQ.**
  This video talks about the corporate culture inside Google, focusing on the kind of workspace Google has to offer to its employees, and attributing the success and productivity of the firm to the work environment. 3 min 8 seconds

- **Corporate Culture Apple Example. https://youtu.be/EcHpgsTg458**
  This video shows the culture inside Apple, focusing on the state of art technologies that they invent, and the people who work in the company. 4 mins 35 seconds

Assignments Completed For Today *(include title and description of assignment as noted on syllabus):*
Event Reflection (10 points): Attend an event on campus that is connected to your FIGS topical area or academic success. Provide a summary of the event. What did you learn? What did you enjoy most about the event? How will this information learned help you as a student? The event must be approved by instructor prior to attending.

Final Group Project Topic
The final project must involve conducting a literature review of research done in a specialized domain of Computer Science, and must tackle a sort of challenge in the domain. The final project must talk about the importance and implications of the challenge, along with approaches used in order to overcome the challenge. The project must also focus on what kind of results, if any, have been observed, and how solving or approaching the problem has helped the domain.

CLASS OUTLINE (Includes opening and closing, discussion questions, expected responses, transitions, clear explanation of how elements are connected to topical areas, clear explanation of connection to Rutgers, etc.)	Resources / Materials Needed:	Timing (i.e. 11:00 am-11:15 am 15 min):
Today, the class looks at corporate culture and policies in other tech companies. We also learn the Software Development Lifecycle, a vital technique in developing technology in corporate companies today.		
Corporate Cultures We look at two videos that show the corporate cultures of Google and Apple, two large tech giants. The class then has a discussion to arrive to a collective definition of corporate culture in tech companies.	Videos	11:30am – 11:45am (15 mins)
Discussion **Question:** What are the themes that you see specifically in the two videos? **Expected Answer:** Apple's corporate culture focused a lot on the products and the employees being experts, while Google's video focused a lot on the employees being productive because of the culture Google offers them.		
Question: Everyone has their own idea of a perfect corporate culture? What do you think will be your ideal culture? Why do you think so? **Expected Answer:** Varied- depending upon person to person. Example: my ideal work environment is based on my work experience. I would like a work environment which allows its employees to be productive by reducing any stressful elements in the workplace. Allow them to go for hikes, keep team sizes small, less bureaucracy.		
Task: Discuss among yourselves and come up with your own ideal corporate culture that should be developed for a company. Write down the qualities on the board.		(will take 5 mins)
Transition *Now that we have seen how the environment in tech companies is, let's focus on the working of these companies as well! All companies use a form of a process of software development. This process is called the Software Development Life Cycle!*		
Software Development Life Cycle The students did something similar during Week Two, looking at the life cycle for website development. In this section, I go over the phases of the SDLC in detail and delineate what each of them signifies. I do this without using PowerPoint, just using the chalkboard to make points, and make students write down the points on the different boards/ posters in the classroom instead. Phases of SDLC: 1. Planning	Readings Posters/ Markers	11:45am-12:10am (25 mins)

2. Defining
3. Designing
4. Building
5. Testing
6. Deployment/ Maintenance
 	
I use a collaborative teaching method called learning circles, where each group learns what one phase is and tries to explain it by presenting it to the rest of the class.
   - Each group is assigned one phase of the SDLC, i.e. the students split up into six groups.
   - The groups work on their assigned phase, using the readings as material for reference, to understand what the particular phase is, and then decide the best way to present it, and create a poster or represent it on the board.
   - After the groups are done working within themselves, each group takes turns to explain their section to the rest of the class.
		(this will take up 15 mins)

Transition

Now that we have seen how much planning goes into software development, let's change our perspectives. Seeing that planning is the starting phase of the SDLC, planning is also the starting phase of your academic life at Rutgers. We have Dean _____ here today to help us out with Academic Planning, which is an extremely important concept for any Rutgers student!

Academic Planning Session with Academic Dean

Topics: Requirements for graduation, Declaring a major, using Degree Navigator, Registration for courses, WebReg.

12:10pm-12:50pm (40 mins)

Closing
Thank you very much Dean _____ for providing us such helpful advice, I hope the students find it easier to do preregistration for the Spring! Please remember, you can always reach out to the deans during this period, and there's an online chat feature available to help you out in case you get stuck! I hope that today's lecture on the lifecycle and planning a software also gave you an idea of how important planning is!

Announcements *(add in week before lesson):*
None

Readings Due for Next Week *(include APA citation and summary):*
Riedl, M. O., & Bulitko, V. (2013, March 22). Interactive Narrative: An Intelligent Systems Approach. *AI Magazine*.
This paper talks about the field Computational Narratives, which is about making stories interactive in nature so that they change depending upon the user's choice, making the stories more immersive.

Assignments Due for Next Week *(include title and description of assignment as noted on syllabus):*
None

Week EIGHT, Date: November 1, 2016
Name of Lesson: RU Game?
Objectives: - Students will be able to understand the role that Computer Science plays in developing Games. - Students will be able to interact with a professor in the Computer Science Department. - Students will be able to gain an insight into Computational Narratives, a new upcoming domain in the field of Computer Science. - Students will be able to read an academic article in computer science effectively.
FIGS Element(s) covered: Creating a Supportive Learning Environment & Community Building, Faculty Connections, Information Literacy.
Pre-class preparation *(include technology needs, copy requests, supplies requests, computer lab requests, etc., PowerPoint creation, uploading of article to Sakai, confirming speakers, etc.):* - Download the video for offline viewing. - Confirm with Prof. Kapadia about the time and location of the class. - Print out copies of the paper on Stories.
READINGS completed for today as homework OR read in class as short in-class reading assignment *(include APA citation and summary)*: Riedl, M. O., & Bulitko, V. (2013, March 22). Interactive Narrative: An Intelligent Systems Approach. *AI Magazine*. This paper talks about the field Computational Narratives, which is about making stories interactive in nature so that they change depending upon the user's choice, making the stories more immersive.
VIDEOS to be Shown Today OR viewed as homework for today's class *(include video title, link, 2-3 sentence summary, and length/section. Video length should not exceed 10 minutes):* **"Making Your First Game: Basics - How To Start Your Game Development - Extra Credits"** https://youtu.be/z06QR-tz1_o This video talks about what non-programmers/ programmers with no game experience should think about when considering building a game. It lists down the steps involved while making a game, and gives important tips, such as shooting for a basic game over finished commercial level products, or finding help on the forums if one comes across an obstacle.
ASSIGNMENTS Completed for Today *(include title and description of assignment as noted on syllabus):* **None.**

CLASS OUTLINE (Includes opening and closing, discussion questions, expected responses, transitions, clear explanation of how elements are connected to topical areas, clear explanation of connection to Rutgers, etc.)	Resources / Materials Needed:	Timing (i.e. 11:00 am-11:15 am 15 min):
Begin the lecture by asking students what games do they like to play, and have they ever thought about getting into Game Development.		11:30am-11:32am (2 mins)
Game Development Briefly talk about how important physics is in the Game world, and talk about what game engineers are. Show the students the video, and then have a discussion about it. **Discussion Question:** Why does the video emphasize so much on the fact that the games you make will not be even close to commercial games such as God of War? **Response:** Mainstream games don't just involve programming skills, a lot more goes into the game apart from programming. This includes but is not limited to art skills, direction skills, story writing skills, and design skills, along with some animation experience as well. **Discussion Question:** Can we come up with a basic example of a game that we could build, based on what the video said? **Response:** My first game was simply a circle moving up and down on the left of the screen while smaller circles kept randomly shooting leftwards from the right side of the screen. I later added images to make it an "avoid the bullets" game. **Discussion Question:** Can you think of a way in which we can make the game non-linear? That is, it changes every time the user plays it. **Response:** A lot of games rely on the random aspect to work. For example, games like Snake, or even shooter games rely on objects spawning in different locations so as to make the game feel different every time. However, is it possible to make a story based game different…? (This is what the guest speaker will talk about.) **Transition** *Let's think about that concept more: how can we make games more immersive? Our next activity will actually tell us more about adding more perspective to the kind of games we can build!* **Reading a Research Paper**	Video	11:32am – 11:45am (13 mins)
I now split up the class into groups, and distribute copies of the research paper for them to read. The sections itself are pretty independent from each other after the introduction part and don't rely on technical	Research Paper printouts	11:45am – 12:05pm (20 mins)

knowledge, they rely on concepts in games, which is something that is already being discussed in the lecture. They should have read the paper beforehand, but I give them about five to ten minutes to discuss the points of the paper within their groups.

The groups will be asked to focus on the following: understanding the abstract terms and the concept behind them, understanding how the work mentioned in the section fits into the objective of the paper, and finally make a connection to a game or give an example of how a game could use the existing concept. (I will put this up on a slide during the activity so the students can refer to it).

The groups will be responsible for presenting a part of the reading to the rest of the class in their own words. I will go around helping the students understand the paper and we will revise what we had learnt previously about Information Literacy.

Sections:

2, 3, First half of 3.1, Second half of 3.1, 3.2, 3.3, 4

Transition *Now that you have seen what reading a research paper feels like, you may understand when I say that sometimes companies may need an expert in a particular domain to help them out with a challenge. And this is where research comes in: people who excel at research focus on problems currently in the field, and let's welcome Prof. Kapadia from the Computer Science Department here today. His field of research involves Crowd Simulation, Digital Storytelling and Character Animation.*		12:05pm-12:10pm (5 mins)
Faculty Connection Talk **Name:** Prof. Mubbasir Kapadia **Contact:** mk1353@scarletmail.rutgers.edu **Status:** Confirmed that he is interested and is tentatively free, but need to remind him once Fall starts. **Bio:** Mubbasir Kapadia is an Assistant Professor in the Computer Science Department at Rutgers University. Previously, he was an Associate Research Scientist at Disney Research Zurich. He was a postdoctoral researcher and Assistant Director at the Center for Human Modeling and Simulation at University of Pennsylvania. His field of research involves Crowd Simulation, Digital Storytelling and Character Animation. **Topic:** Basic overview of what he researches in, and the domains he is into. He will also give a presentation about Digital Storytelling, which is on similar lines to the research paper the students read. He intends to go		12:10pm-12:50pm (40 mins)

over his research project based on an interactive game with Winnie-the-Pooh bear characters.

Closing
So today we learnt interesting stuff about games, as well as did some reading of a research paper! Hope that the research paper exercise is helpful for your group projects as well!

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Announcements *(add in week before lesson):*
None

Readings Due for Next Week *(include APA citation and summary):*
None

Assignments Due for Next Week *(include title and description of assignment as noted on syllabus):*
"One Step Ahead" Assignment:

In this assignment, students must foray into computer science on their own, using the topics done in the classroom as a starting point.

Learn a new data structure

Students interested in learning about data structures or algorithms can delve deeper into one of the topics done during week five (data structures and algorithms), and write a reaction paper on what their interpretation of the particular topic is.

Possible data structures include but are not limited to: stacks, queues, linked lists, multi-dimensional arrays, trees, binary search trees.

Important questions to answer: What is the data structure and how does it work? How is it utilized? In what situations is it commonly used?

Submission: Typed word document, Times New Roman, 12pt. double spaced. Suggested length: 2 pages.

Week NINE, Date: November 8, 2016
Name of Lesson: Cool Stuff- IoT and Robotics

Objectives:

- Students will be able to participate in discourse on new upcoming technologies in the computer science domain and what they mean, such as Internet of Everything and Robotics.
- Students will be able to comprehend and compose their own ideas for converting everyday objects into technology.
- Students will be able to locate research opportunities on campus and find more resources on them.

FIGS Element(s) covered: Creating a Supportive Learning Environment & Community Building, Information Literacy (reviewing research opportunities on campus)

Pre-class preparation *(include technology needs, copy requests, supplies requests, computer lab requests, etc., PowerPoint creation, uploading of article to Sakai, confirming speakers, etc.):*

- Prepare questions for the quiz game.
- Prepare PowerPoint presentation for cyber security and data warehousing.
- Bring blocks / cubes for the Build your Robot Activity.
- Get materials for sketching: sketch pens and paper.
- Get a jar of marbles as points for today's class.
- Download the video for offline access.

READINGS completed for today as homework OR read in class as short in-class reading assignment (*include APA citation and summary*):
 None

VIDEOS to be Shown Today OR viewed as homework for today's class *(include video title, link, 2-3 sentence summary, and length/section. Video length should not exceed 10 minutes):*
The Basics of Robotics, https://youtu.be/Nj-zCvPY_Wo
This video explains the basics of robotics through Cubelets, a learning technology that allows people to build robots without coding. The parts of a robot, and the functions that robots perform are shown very well in this video. Length: 10 min 28 sec (the last 30 seconds are credits)

ASSIGNMENTS Completed for Today *(include title and description of assignment as noted on syllabus):*
"One Step Ahead" Assignment:

In this assignment, students must foray into computer science on their own, using the topics done in the classroom as a starting point.

Learn a new data structure

Students interested in learning about data structures or algorithms can delve deeper into one of the topics done during week five (data structures and algorithms), and write a reaction paper on what their interpretation of the particular topic is.

Possible data structures include but are not limited to: stacks, queues, linked lists, multi-dimensional arrays, trees, binary search trees.

Important questions to answer: What is the data structure and how does it work? How is it utilized? In what situations is it commonly used?

Submission: Typed word document, Times New Roman, 12pt. double spaced. Suggested length: 2 pages.

CLASS OUTLINE (Includes opening and closing, discussion questions, expected responses, transitions, clear explanation of how elements are connected to topical areas, clear explanation of connection to Rutgers, etc.)	Resources / Materials Needed:	Timing (i.e. 11:00 am-11:15 am 15 min):
IoT I give a talk about Internet of Everything, what comes with it and how it is developed. I use popular examples of IoT devices in today's world, such as watches, refrigerators, Amazon button devices, and a few more. I go into details about the applications of the above products and the usability/cost of these products.	PowerPoint Presentation	11:30am – 11:40am (10 mins)
Come up with your own IoT idea The students divide into groups, and each group brainstorms over a possible object that they could use IoT on, how they would use it, and how usable they are. The activity mainly focuses on: -Creativity of ideas - Use of popular technologies - Presentation. TWIST: The groups get 3 minutes to think, and after that, it's time to present. The next seven minutes are for presentation, and groups try to come up with something within the ten minute timespan. As each group presents, I give each member a marble to hold on to for an activity		11:40am-11:55am (15 mins)
Transition *I hope you guys had fun adding internet to daily objects around you! Our next topic is on similar lines, where instead of adding internet to objects to perform tasks, we build agents which can perform those daily tasks for us! Let's look at Robots!*		
Robotics Show the students the video about the basics of Robotics using cubelets. **Discussion:** **Question:** Since this video does show a lot of cool stuff, which gadget/ block introduced did you find the most intriguing? Which one would you really try to experiment with? **Expected Response:** Varied responses. Sample response: I found the proximity sensor the most interesting, more because of the possibilities that the video shows. It would be really cool to connect a proximity sensor in a way that the bot will always follow you where you go. Imagine having a robot that carries	Video	11:55am-12:10pm (15 mins)

your stuff where you go, and maybe I can hook up my phone to it, it turns into a moving Dock (and with Siri, it's a talking Butler!) **Question:** This product is intended for young children to play around with, which makes its features understandable. What advanced feature or block do you think you would introduce, based on what you've learned in Science classes? **Expected Response:** Varied responses. Sample Response: I think there's a lot of cool stuff that can still be added to it. For example, I would like to see the concept of electromagnetism being added in the actor blocks. Imagine the robot going around sensing walls, and when it comes in contact to the wall, the magnet turns on, this could be used in many ways! (I thought of using this to open a door.) **Question:** Since this is built in such an easy manner, there is no coding involved at all. Where do you think do Computer Science majors add in their work in this Cubelets project? **Expected Response:** The thinking block is the first place that comes into mind, since the video references to the thinking blocks as the CPU of the robot. A lot of work goes into the thinking blocks, depending on how complex the actions performed by the robot are going to be. However, there can be scope for the Computer Science major in the other blocks too. What if you want a sensor block that senses a color or a line? What if you want a Robot with facial recognition sensing? We can also have the actor block do complex actions such as draw on paper, which would need some commands to be given to the motor, and there's coding involved. **Question:** Can you tie this back to the presentation by RU Autonomous during our excursion a few weeks ago? How? **Expected Response:** Varied responses, depending upon the presentation by RU Autonomous (which confirmed that they will be presenting).		
Build your Neighbor's Robot! In this activity, I divide the class into an even number of groups. Each group needs to come up with a robot idea, and build the blueprint of the robot, by simply drawing a rough sketch what blocks they would use from the video and how would they place them. TWIST: The groups switch ideas among each other (not blueprints), and then I distribute cubes. The task is to build the other team's robot correctly with the cubes, labelling the cubes for what parts they are. The groups can then compare their robots with the blueprints made by the other group.	Materials for sketching Cubes	12:10pm-12:30pm (20 mins)

Transition *Alright, now this was our final topic for this course! If you guys really enjoyed coming up with your own ideas, I suggest looking at research, it does involve looking at the latest technology and working with it!* **Research on Campus** Talk a little bit about research opportunities on campus. Talk about Aresty Research Center, and Independent Study in Computer Science, both of which offer amazing opportunities to do research. Talk about Rutgers being a public research school, and what that means. **Transition** *And now, let's review what we have done over the nine weeks so far. I was thinking that the best way to do this would be with a fun game!*		12:30pm – 12:35pm (5 mins)
Quiz Time! In this activity, I play a simple team based Q and A type of game, where the entire class can participate as their robot activity teams instead of just a few people. The team who gets the right answer gets a marble, and in the end, the *team* with the most marbles wins. The same team cannot answer twice in a row. I will have about 10 questions: 9 for each week, and one random question. **Closing** *Alright everyone so this was our last class where we did some learning. I hope that this activity provided a good brush up of our nine weeks for you, and were a great way to reflect upon what we covered! See you next week for the final presentations!*	Quiz Cards/ slides Marbles	12:35pm-12:50pm (15 mins)

Announcements *(add in week before lesson):* Remember to send final project digital presentations if needed by the night before our next class.
Readings Due for Next Week *(include APA citation and summary):* None

Assignments Due for Next Week *(include title and description of assignment as noted on syllabus):*
       Final Group Project (30 points)
 	
       All students must participate in both the planning of the final project and the group presentation on the last day of class to pass the FIGS course. Group presentations should be 6-8 minutes in length. All presentations should have a visual aid component with at least

three scholarly sources cited appropriately (i.e. PowerPoint, handout, etc.) to be posted on Sakai.

- *The final project must involve conducting a literature review of research done in a specialized domain of Computer Science, and must tackle a sort of challenge in the domain. The final project must talk about the importance and implications of the challenge, along with approaches used in order to overcome the challenge. The project must also focus on what kind of results, if any, have been observed, and how solving or approaching the problem has helped the domain.*

- *The choice of domain and the problem needs to be submitted to the instructor by week seven.*

A rubric and more detailed description of the final project will be distributed in class and posted on Sakai at a later date. A portion of each student's final grade will be based on peer evaluations of his/her contributions. Final group projects must be completed by the groups assigned by the peer instructor.

Week TEN, Date: November 15, 2016

Name of Lesson: Exit(0): The Final Presentation!

Objectives:

- Students will be able to articulate their computer science related projects to the class.
- Students will gain skills in presenting a project in front of an audience.

FIGS Element(s) covered: Creating a Supportive Learning Environment & Community Building, Final Group Project.

Pre-class preparation *(include technology needs, copy requests, supplies requests, computer lab requests, etc., PowerPoint creation, uploading of article to Sakai, confirming speakers, etc.):*

- Ensure that all groups send in their presentation slides.
- Download all the presentations offline.
- Make arrangements to order pizza for the students

READINGS completed for today as homework OR read in class as short in-class reading assignment (*include APA citation and summary*):
 None.

VIDEOS to be Shown Today OR viewed as homework for today's class *(include video title, link, 2-3 sentence summary, and length/section. Video length should not exceed 10 minutes):*
None.

ASSIGNMENTS Completed for Today *(include title and description of assignment as noted on syllabus):*
Final Group Project (30 points)

All students must participate in both the planning of the final project and the group presentation on the last day of class to pass the FIGS course. Group presentations should be 6-8 minutes in length. All presentations should have a visual aid component with at least three scholarly sources cited appropriately (i.e. PowerPoint, handout, etc.) to be posted on Sakai.
- *The final project must involve conducting a literature review of research done in a specialized domain of Computer Science, and must tackle a sort of challenge in the domain. The final project must talk about the importance and implications of the challenge, along with approaches used in order to overcome the challenge. The project must also focus on what kind of results, if any, have been observed, and how solving or approaching the problem has helped the domain.*

- *The choice of domain and the problem needs to be submitted to the instructor by week seven.*

A rubric and more detailed description of the final project will be distributed in class and posted on Sakai at a later date. A portion of each student's final grade will be based on peer evaluations of his/her contributions. Final group projects must be completed by the groups assigned by the peer instructor.

CLASS OUTLINE (Includes opening and closing, discussion questions, expected responses, transitions, clear explanation of how elements are connected to topical areas, clear explanation of connection to Rutgers, etc.)	Resources / Materials Needed:	Timing (i.e. 11:00 am-11:15 am 15 min):
<u>Importance of Presentations</u> I talk about the importance of presentations in tech companies. I talk about my experience during my internship itself and the types of presentations I had to do, and their impact. I focus on how presentations should be done, and offer quick tips to the students to not feel anxious.		11:30am – 11:34am (4 mins)
<u>Stressbuster Yoga</u> I perform a stressbuster activity (a small one-minute Yoga tactic that involves stretching).		11:34am-11:35am (1 min)
<u>Group Presentations</u> Each group goes ahead and presents their project to the rest of the class. Their presentation should last about 7 minutes, with all members taking part in it. After that, I encourage the other students to ask questions and personally ask questions based on their project. The last one minute I applaud them for their work and ask the next group to come and present. There are approximately 6 to 7 groups, so this will take up most of the class.	PowerPoint Presentations	11:35am-12:30pm (55 mins)
<u>Closing Wrap-up and Discussion</u> I talk about how the experience in class was, and perform the SIRS survey. I ask a couple of open ended discussion questions, time permitting. **Question 1: What's your favorite place in Rutgers? Why?** Questions basically asking which is their favorite spot, and why. This is more of a generic question to get the students to feel lighter by talking about something interesting. Move the topic ahead by asking questions like "Which campus do you like the most?" "Have you gone to see the horse treadmill on Cook Campus?" "Which Rec Center did you feel is the best?" **Question 2: Which in-class activity was the most memorable?** Talk about what worked the most, and why the students enjoyed it. Ask questions such as "Which was the most memorable video?" "What topic do you wish you learned more about?" "How well do you feel you know about Rutgers?"		12:30pm – 12:50pm (20 mins)

"How well do you feel you know about Computer Science at Rutgers?" **<u>Closing</u>** *Thank you for this amazing class guys, I really enjoyed teaching it and hope you guys enjoyed it as well. Don't hesitate to reach out to me after this course if anything, and I wish you guys good luck with the rest of your semester!*		51

Announcements *(add in week before lesson):* None.
Readings Due for Next Week *(include APA citation and summary):* None.
Assignments Due for Next Week *(include title and description of assignment as noted on syllabus):* **None.**