CIS111 – Discovering Computer Science
Syllabus Spring 2019

Meeting Time & Location:	Instructor:
Tapley 227	Andrea Johnson
Sec 03 MWF: 1:00 PM - 1:50 PM	ajohn308@spelman.edu
	Office Location: Tapley 218
Course Lab Hours & Location:	**Office Hours & Location:**
Tapley 227	ACC 105
Sec 02: M 2:00 PM - 3:15 PM	M:
	W: 2 - 3:30 PM
	T: 2:30- 4:00 PM
Main Text: Python for Everyone, 2nd Edition by Horstmann & Necaise ISBN-10: 978-1-119-05655-3	**Prerequisites:** None

Course Supplies:
1. Storage device for saving files (any of the following: Cloud storage, flash drive, portable Hard Drive, etc.)
2. Notebook (spiral, loose leaf)

Course Description:
> This course introduces the study of Computer Science based on an algorithmic problem-solving approach. The course covers a brief history of computer science, basic computer science principles, including, problem solving methods, the definition of an algorithm, pseudocode to represent algorithms, sequential, conditional and iterative operations, the binary number system, Boolean logic, and an introduction to programming concepts using the high-level Python programming language. Upon completion of this course, students will have demonstrated the application of computational algorithmic thinking skills to solve problems. This course is designed for computer science majors, STEM majors and computer science minors.

Goals
The goals of this course include:
1. Introduce problem solving methods via computational algorithmic thinking;
2. Develop techniques for effectively using the computer as a problem-solving tool;
3. Develop skills for computer programming in Python
4. Develop the students' understanding of applications of computer science in their various majors
5. Developing team skills

Learning Objectives:
Upon completion of this course, the student will be able to:
- Demonstrate thorough examination of computing fundamentals.
- Develop computational algorithms for problem solving;
- Demonstrate algorithmic thinking in a variety of contexts, including cooking, everyday problems and creating games;
- Translate algorithms into a high-level programming language that executes correctly;
- Develop strong communication skills via oral presentation of projects and written assignments.
- Develop team working project management skills.
- Demonstrate usefulness of computer science and programs for their field a of study.

Method of Instruction:
Instruction will consist of assigned readings, classroom discussions, preparation activities, homework assignments, in-class exercises, laboratories, and projects.

Assigned Readings & Videos: All readings and/or videos should be completed prior to class time to aid understanding of the material.

Classwork & Homework Assignments: Homework and classwork assignments are designed to reiterate algorithmic concepts. You are expected to complete homework problem sets as given. These problems may or may not be found within the textbook, and some problems may require the use of a computer to complete.

In-class & Lab Assignments: You are expected to complete in-class activities and lab assignments during the allotted laboratory time. You may work in groups of two for lab assignments, however your submissions will be done <u>individually</u>.

Projects: You will engage in three projects during this course. For the "*How Computing Affects your Future Career website*" project, you will prepare and present a 5-minute PowerPoint presentation to the class.

> *How Computing Affects your Future Career website:* This project will allow you to create and design a webpage that introduces you and your desired future career. You will have to highlight how computing affects that future career and ways in which you can use what you will learn to help in your career.

> *Individual Python Project:* This project you will design and implement a software solution to a problem using the Python Programming Language.

> **Group Python Project:* This project you along with 3-4 others will design and implement a software solution to a problem using the Python Programming Language, and project management practices

Modifications to Syllabus:

I reserve the right to modify the syllabus based upon students' progress, instructor evaluation of students' performance and/or unforeseen acts of nature that impact progression of course content and rubric. I will provide written notification at the time of modification for record keeping purposes.

Evaluation Summary:

Exams	20%	Quizzes, Homework & Programming Assignments	15%
Projects	30% (10% each)	Lab Final	10%
Final Exam	20%	Labs	5%

Numerical Grade	Letter Grade	Numerical Grade	Letter Grade
94 – 100	A	77 – 79	C+
90 – 93	A-	74 - 76	C
87 – 89	B+	70 – 73	C-
83 – 86	B	60 – 69	D
80 – 82	B-	<60	F

Note: Save all checked and graded assignments and exams/quizzes for possible future inquiries regarding grades.

Appeals Policy/Grade changes: To appeal a grade, send an email to your instructor's email address within one week of the grade having been received. Overdue appeals will not be considered.

Cell Phone Usage:
Cell phones are not to be used during class time for any purposes unless the instruction gives permission. No texting, placing or answering calls will be tolerated. Student will be asked to leave the class and will receive no credit for in-class activities on that day if she cannot adhere to this policy. On exam days, cell phones will be collected at the beginning of class and returned at the end of the exam.

Late Policy:
No late assignments will be accepted unless there was a written prior agreement with the professor, or if the absence on the due date is an excused absence according Spelman College's excused absence policy. The professor has the option to drop the assignment if accepting the assignment late will affect the integrity of the assignment.

Attendance:
Students are required to be present and on time for each class and are responsible for all material covered in class whether they are present or absent. Frequent absences may negatively result the student's academic performance in the course and be reflected in a lower grade than earned. **The instructor may withdraw students with excessive unexcused absences.**

Class Cancellation Policy:
If for any reason a class is not held at the assigned time, all work scheduled for that day is automatically rescheduled for the next scheduled class period. Any projects, assignments, or homework due on a missed day

are due at the next scheduled class period. Similarly, any tests scheduled for a class period which is not held at the assigned time will be given at the next scheduled class period.

Academic Honesty:

At the heart of Spelman College's mission is academic excellence, along with the development of intellectual, ethical and leadership qualities. These goals can only flourish in an institutional environment where every member of the College affirms honesty, trust, and mutual respect. All members of the academic community of Spelman College are expected to understand and follow the basic standards of honesty and integrity, upholding a commitment to high ethical standards. Students are expected to read and abide by the Spelman College Code of Conduct (see the current Spelman College Student Handbook) and are expected to behave as mature responsible members of the Spelman College academic community. Students are expected to follow ethical standards in their personal conduct and in their behavior towards other members of the community. They are expected to observe basic honesty in their work, words, ideas, and actions. Failure to do so is a violation of the Spelman College Academic Integrity Policy. Violators will be subject to the sanctions outlined in the Spelman College Bulletin.

What is cheating? Cheating can be defined by the following list of actions:
- Turning in work done by another student as if it's your own work;
- Using someone else's work, research or publications without giving them credit for their work (plagiarism);
- Failure to cite references of previous research in your research paper or literature review;
- Copying someone else's work and pasting it into a document to pass it off as your own work;
  In Programming, this also means,
  - using the same code as a classmate and only changing variable names
  - simply changing the placement of code to look different than someone else's
- Misrepresenting events to the instructor so that you benefit.

If you cheat, some or all of the following actions will be taken:
- You will receive a zero for that particular assignment or exam.
- A report of the incident may be forwarded to the Dean of Undergraduate Studies. The Dean may file the report in your permanent record and/or take further disciplinary action.

Accommodations:

Spelman College is committed to ensuring the full participation of all students in its programs. If you have a documented disability (or think you may have a disability) and, as a result, need a reasonable accommodation to participate in class, complete course requirements, or benefit from the College's programs or services, you should contact the Office of Disability Services (ODS) as soon as possible. To receive any academic accommodation, you must be appropriately registered with ODS. The ODS works with students confidentially and does not disclose any disability-related information without their permission. ODS serves as a clearinghouse on disability issues and works in partnership with faculty and all other student service offices. For further information about services for students with disabilities, please contact the ODS at 404-270-5289 (voice), located in MacVicar Hall, Room 106.

Topical Outline: This is meant to serve as an approximate schedule. Any significant modifications to the schedule will be made as early as possible.

CIS111 – Discovering Computer Science
Syllabus Spring 2019

Wk	Date	Topic	LAB	Assignments*	Reading
01	1/16	First Day of Classes: Introduction/Syllabus	NO LAB	Lynda.com signup	Horstmann Ch. 1
02	1/21 MLK Day (no classes)	Horstmann Ch. 1 -	NO LAB	**CS Unplugged Activities** **Project 1 Future Career (Assigned)**	Horstmann Ch. 2 (Introduction)
03	1/28	Horstmann Ch. 2 - Variables, Arithmetic	LAB 1: Intro to algorithmic thinking	Quiz 1	Horstmann Ch. 2 (Programming with Numbers and Strings)
04	2/4	Horstmann Ch. 2 - Strings, I/O	LAB 2: Intro to IDLE	Quiz 2 **Project 1 (DUE)**	Horstmann Ch. 3 (Decisions)
05	2/11	Horstmann Ch. 3 -	LAB 3:	Quiz 3 Study For Exam 1	Horstmann Ch. 4 (Loops)
06	2/18	Horstmann Ch. 4 - While, Sentinel, Common Loop Algorithms	LAB **Exam 1 (Chapters 1-2)**	Quiz 4	Horstmann Ch. 5 - Functions
07	2/25 *SIGCSE CONFERENCE 2/27-3/2, 2019 (no classes)*		LAB 4:		**Study for Midterm**
08	3/4	Horstmann Ch. 4 - for loops, Nested loops, Processing Strings	LAB: **Midterm Exam (1-3)**	**Project 2 (Assigned)**	Horstmann Ch. 5 - Functions
09	3/11 *SPRING BREAK (no classes)*			Quiz 5	
10	3/18	Horstmann Ch. 5 - Functions, Parameter Passing, (Non) Return Values	LAB 5: Formatting Numbers	Quiz 6 **Project 2 (Due)**	Horstmann Ch. 6 - Lists
11	3/25	Horstmann Ch. 5 - Reusable, Stepwise, Variable Scope	LAB 6:	Quiz 7 **Project 3 (Assigned)**	Horstmann Ch. 6 & 7 - Files
12	4/1	Horstmann Ch. 6 - Basic properties of lists, List operations, Common list algorithms	LAB 7: **Exam 3 (4-5)**	Quiz 8 Study for Lab Final	Horstmann Ch. 7 - Files
13	4/8 *FOUNDER'S DAY 4/11*	Horstmann Ch. 6 - Using lists with functions, Adapting algorithms	LAB 8:	Quiz 9	Study for Lab Finals

14	4/15 *GOOD FRIDAY 4/19* *(College closed)*	Horstmann Ch. 7 - Reading and writing text files Text input and output	LAB 9: Lab final Review?	**Quiz 10** **Project 3 (Due)**	
15	4/22 *RESEARCH DAY 4/25* *(no classes)*	Horstmann Ch. 7 - Command line arguments	**Lab Final Exam**		
16	4/29	Last Day of Class 5/1			
17	5/6	FINAL EXAMS			

* Weekly homework and programming assignments will be assigned by the professor

CIS111 02/111L Discovering Computer Science

Spelman College Computer & Information Sciences Fall 2019

COURSE ADMINISTRATION *Instructor:* Andrea E Johnson, Ph.D. ajohn308@spelman.edu (404) 270-5285

Office Hours: ACC105

Tuesday 1:00pm – 3:00pm
Wednesday 2:00pm –
3:00pm Friday 2:00pm –
3:00pm

Course Lecture Hours: Monday, Wednesday, Friday 10:00a – 10:50a, Tapley 227
Course Lab Hours: Wednesday 3:00p – 4:15p, Tapley 227

COURSE INFORMATION Course Description

This course introduces the study of Computer Science based on an algorithmic problem- solving approach. The course covers a brief history of computer science, basic computer science principles, including, problem solving methods, the definition of an algorithm, pseudocode to represent algorithms, sequential, conditional and iterative operations, the binary number system, Boolean logic, and an introduction to programming concepts using the high-level Python programming language. Upon completion of this course, students will have demonstrated the application of computational algorithmic thinking skills to solve problems. This course is designed for computer science majors, STEM majors and computer science minors.

Learning Objectives Upon completing the course,
a student will be able to:

● Demonstrate thorough examination of computing fundamentals;

● Develop computational algorithms for problem solving;

● Demonstrate algorithmic thinking in a variety of contexts, including cooking, everyday problems and creating games;

● Translate algorithms into a high-level programming language that executes correctly;

- Develop strong communication skills via oral presentation of projects and written assignments;

- Develop team work skills;

- Demonstrate usefulness of computer science and programs for their field a of study.

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Prerequisites: None

Course Credits: 4

Computer Resources Computer labs in Tapley 223, Tapley 227 and Science Center 230 are available for student use. Note that while SC 230 is open 24 hours for student use, Tapley 223 and 227 are used as classrooms during the day and are not available for use at such times.

Tutorial Services Students needing tutorial services can refer to the Student Success Center, Milligan Building, 2nd Floor and the Directed Supplemental Instruction Program, Science Center 281.

Required Textbooks

    Zybooks, CIS111: Discovering Computer Science
    1. Sign in or create an account at learn.zybooks.com
    2. Enter zyBook code:
    SPELMANCIS111JohnsonFall2019 3. Subscribe

Method of Instruction Instruction will consist of assigned readings, classroom discussions, preparatory participation activities, homework assignments, in-class exercises, laboratories, and projects.

- *Assigned Readings*: All readings should be completed prior to class time to aid understanding of the material.

- *Homework Problems (Participation activities)*: Homework and classwork assignments are designed to reiterate algorithmic concepts. You are expected to complete homework problem sets as given. These problems may or may not be found within the textbook, and some problems may require the use of a computer to

complete.

- **In-class & Lab Assignments:** You are expected to complete in-class activities and lab assignments during the allotted laboratory time. Students may discuss concepts in groups of two for lab assignments, however your submissions will be done individually.

- **Programming Assignments:** Programs for this course will be developed in Python 3. Students are strongly encouraged to install Python 3 on their personal laptops.

- **Projects:** You will engage in three projects during this course. For the "**In the Mix website**" project, you will prepare and present a 5-minute PowerPoint presentation to the class.

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- **It's in The Mix:** This project is designed to help you understand algorithms in a deeper way. The project focuses on studying recipes as algorithms, examining how algorithms are designed, expressed, and articulated. Your project will involve designing, creating, and adapting "your favorite" recipe for an online cookbook.
- **Individual Python Project:** This project you will design and implement a software solution to a problem using the Python Programming Language.
- ***Group Python Project:** This project you along with 3-4 others will design and implement a software solution to a problem using the Python Programming Language, and project management practices

Modifications to Syllabus: I reserve the right to modify the syllabus based upon students' progress, instructor evaluation of students' performance and/or unforeseen acts of nature that impact progression of course content and rubric. I will provide written notification at the time of modification for record keeping purposes.

COURSE GRADING INFORMATION Evaluation Summary Projects 30% Exams 20%
Homework, quizzes and participation activities
15%
Lab 5% Lab Final 10% Final Exam 20%

Grading Scale Numeric Letter Numeric Letter 93 - 100 A 77 - 79 C+ 90 – 92 A- 73 - 76
C 87 - 89 B+ 70 - 72 C- 83 - 86 B 60 - 69 D 80 – 82 B- < 60 F
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Grade changes: Once grades have been administered for any assignment, you have

fourteen (14) days from the date you received the grade to discuss any changes or issues with the assignment in question.

COURSE SCHEDULE AND IMPORTANT DATES Tentative weekly course of instruction

The instructor retains the right to change the schedule of study as needed. Problem sets associated with each topic will be posted on Moodle.

Week Topics/Assignments Readings

1
8/1
9

come Introduction to Python

Zybooks
Chapter 1

Zybooks
Chapter 3
Zybooks
Chapter 3

2
8/2
6

ables and
ressions Project
Assigned

Zybooks Chapter
1-2
Zybooks Chapter
1-2

5
9/1
6

Chapters

Zybooks
Chapter 4
Zybooks
Chapter 4

3 9/2 *9/3 Labor Day*
(no classes)
ables and Expressions Zybooks Chapter 2

6
9/2
3
oops Zybooks Chapter 4-5

4

9/

9

7
9/3
0

Exam #2

3
3s

apters 1-3) Project #2 igned

1

Zybooks
Chapter 5
Zybooks
Chapter 5

Zybooks
Chapter 6
Zybooks
Chapter 6

8 10/7 *10/7-10/9 Fall Break (no classes)*

ps Zybooks Chapter 5

11
10/2
8

9
10/1
4

igs Zybooks Chapter 6

Zybooks
Chapter 7
Zybooks
Chapter 7

10
10/2

4

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Lists **12** 11/4
and Dictionaries **EXAM #3 (4-6)**
Zybooks Chapter 7

13 11/11

Functions *Zybooks Chapter 8*

14 11/18

Functions and Files *Zybooks Chapter 8-9*

15 11/25 *11/27-11/29 Thanksgiving Holidays (no classes)*

*Project #3 Due

16 12/2 *12/5-12/6 Reading Days (no classes)*

Last Day of Class 12/4

Final Exam: Tuesday, December 10 01:00 p.m. - 03:00 p.m.

COURSE POLICIES General Course Administration Policy

The course syllabus is not a contract. It is a guideline on how the course will be conducted. The instructor retains sole discretion over all aspects of the course including its administration, syllabus, grading, policies, etc. The instructor retains the right to modify any part of the syllabus as necessary to ensure a productive and effective course. Any such changes will be preceded by adequate notice.

Attendance and Tardiness Policy

Students are required to be present and on time for each class and are responsible for all material covered in class whether they are present or absent. **The instructor may withdraw students with excessive unexcused absences.** When given, quizzes will be administered at the beginning of class. No makeup quiz will be given except for excused absences (note the College's excused absence policy below).

Cell Phone Use/PDAs

Cell phone use for activity not related to course work (talking, texting, browsing, etc) is prohibited. *Please silence all electronic devices during class.*

Late Assignment

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No assignments are accepted late unless there was a prior agreement with the professor, or if the absence on the due date is an excused absence according Spelman College's excused absence policy. The professor has the option to drop the assignment if accepting the assignment late will affect the integrity of the assignment.

Academic Integrity

Students caught cheating will receive a grade of zero on the assignment in question and, at the sole discretion of the instructor, may receive a grade of "F" for the course. At the heart of Spelman College's mission is academic excellence, along with the development of intellectual, ethical and leadership qualities. These goals can only flourish in an institutional environment where every member of the College affirms honesty, trust, and mutual respect. All members of the academic community of Spelman College are expected to understand and follow the basic standards of honesty and integrity, upholding a commitment to high ethical standards. Students are expected to read and abide by the Spelman College Code of Conduct (see the current Spelman College Student Handbook) and are expected to behave as mature and responsible members of the Spelman College academic community. Students are expected to follow ethical standards in their personal conduct and in their behavior towards other members of the community. They are expected to observe basic honesty in their work, words, ideas, and actions. Failure to do so is a violation of the Spelman College Academic Integrity Policy. Violators will be subject to the sanctions outlined in the Spelman College Bulletin.

What is cheating?

Cheating can be defined by the following list of actions:

- Turning in work done by another student as if it's your own work;
- Failure to cite references of previous research in your research paper or literature review;
- Copying someone else's work and pasting it into a document to pass it off as your own work;
- Copying all or part of someone else's program, varying the wording, variable names, etc.
- Misrepresenting events to the instructor so that you benefit.
- Copying all or part of someone else's program.
- Reading someone else's program code before writing your own code.
- Asking someone to write all or part of a program for you.

Class Cancellation Policy

If for any reason a class is not held at the assigned time, all work scheduled for that day is automatically rescheduled for the next scheduled class period. Any projects, assignments, or homework due on a missed day become due at the next scheduled class period. Similarly, any tests scheduled for a class period which is not held at the assigned time will be given at the next scheduled class period.

Persons with Disabilities Accommodations

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Spelman College is committed to ensuring the full participation of all students in its programs. If you have a documented disability (or think you may have a disability) and, as a result, need a reasonable accommodation to participate in class, complete course requirements, or benefit from the College's programs or services, you should contact Student Access Center (SAC) as soon as possible. To receive any academic accommodation, you must be appropriately registered with SAC. The SAC works with students confidentially and does not disclose any disability-related information without their permission. SAC serves as a clearinghouse on disability issues and works in partnership with faculty and all other student service offices. For further information about services for students with disabilities, please contact the SAC at 404- 270-5289 (voice), located in MacVicar Hall, Room 106.

COLLEGE
POLICIES

- Excused Absence
Policy

  o Note about granting extensions: While a request may come from the Office of Undergraduate Studies based on information from Health and Counseling Services and/or a verified excused absence, it is the faculty member who determines the length of the extension. It is expected that the faculty member will make reasonable accommodation for the student, who, for circumstances beyond her control, must miss a test or cannot meet the deadline for an assignment.

- Copyright and Fair Use
Statement

  o Copyright laws and fair use policies protect the rights of authors. Copyrighted materials may be used in this class, including articles, music, art work, etc. These materials are provided for private study, scholarship, or research and adhere to the copyright law of the U.S. (Title 17, U.S. Code). You may copy or download from the course website one copy of the materials on any single computer for non-commercial, personal, or educational purposes only, provided that you do not modify it and use it only for the duration of this course. Beyond this use, no material from the course or website may be copied, reproduced, re-published, uploaded, posted, transmitted, or distributed in any way without the permission of the original copyright holder. The instructor nor the College assumes any responsibility for individuals who improperly use copyrighted material.

- Incomplete Policy

  o An Incomplete (IP) is assigned to a student when extenuating circumstances (e.g., illness, death of an immediate family member, or family emergency) prevent a student who is passing a course from completing the final examination or final assignment(s) by the end of the semester. In consultation with a Dean, the faculty member determines if an Incomplete is appropriate and completes the necessary paperwork. The faculty member determines the date for completion of all work. An Incompletion must be changed by the deadline specified on the College academic calendar. A student who cannot complete the Incomplete by the specified deadline must request an extension from the professor, who will notify the Office of the Dean of the extension. If the required work is not completed by the established deadline or the student is not given an extension, the IP will automatically be changed to an F.

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CIS121/121L
Computer Science I

Spelman College Computer & Information Sciences
Spring 2018

COURSE ADMINISTRATION	
Instructor:	Dr. Jaye Nias jnias@spelman.edu (404) 270-5873
Office Hours:	MTRF, 11:00pm – 12:00pm and by appointment Science Center, room 217
Course Lecture Hours: *Course Lab Hours*:	Monday, Wednesday, Friday: 2:00pm – 2:50pm, Tapley 227 Wednesdays 3:00p – 4:50pm, Tapley 227

COURSE INFORMATION

Rationale:
Computer Science I is an introductory course to algorithmic problem solving techniques that can be used for solving problems with computers. The course presents the fundamentals for C++ program design, analysis, implementation, testing and debugging. In addition, the course explores how algorithms solve problems in the various domains of computer science.

Prerequisite: Math 115 Precalculus 1

Course Credits: 4

Goals:
1. Introduce problem solving methods and algorithm development.
2. Develop solid analytical skills and good programming practices.
3. Develop computing techniques for effectively using the computer as a problem-solving tool.
4. Introduce concepts of structured and object oriented programming.
5. Provide a foundation on which to build modern software engineering principles in later courses.
6. Introduce the C++ programming language.
7. Develop an appreciation for computing literature.
8. Introduce issues in the computing field such as ethics and social implications.
9. Provide experience with Internet tools and resources.

Learning Objectives:

Upon completing the course, a student will be able to:

- Develop algorithms for computer-solutions to problems.
- Express algorithms using natural language, pseudo code, flowcharts, and a high-level
- programming language (C++)
- Illustrate techniques of object oriented programming practices.
- Analyze, design, code, test, debug, and document C++ programs.
- Exhibit an interest in staying abreast of technology and the computing field by reading
- and discussing computing literature.
- Display an awareness of the ethical and social implications posed by the increasing use
- of computers.

Course Learning Outcomes:

Program/Course Outcome	Planned Assessment
Demonstrate proficiency in problem-solving techniques and algorithm development	Lab/Homework assignments and exams
Develop solid analytical skills and good programming practices	Quizzes, Lab/Homework Assignments, Exams
Demonstrate proficiency in the C++ programming language	Course Project, Programming Assignments

Planned Learning Assessments:

1. Demonstrate Knowledge: Students will be expected to demonstrate a conversational and written understanding of concepts, vocabulary, and methods. Class participation and examinations will be used to assess this level of learning.

2. Demonstrate Basic Skills: Students will be expected to demonstrate specific abilities, skills and techniques. Homework problems, essay examination questions, and or programming assignments will be used to assess this level of learning.

3. Apply Knowledge and Skills to Extended Problem Scenarios: Students will be expected to write program and complete a semester end project to assess this level of learning.

Computer Resources:

CS students are strongly encouraged to procure a personal laptop computer (preferably a Mac) to provide mobility while working. Computer labs in Tapley 223, Tapley 227 and Science Center 230 are available for student use. Note that while SC 230 is open 24 hours for student use, Tapley 223 and 227 are used as classrooms during the day and are not available for use at such times.

Textbooks and Resources:

The student must read each chapter of the book prior to its discussion. During lectures, the student must listen well, take copious notes, and engage the professor with relevant questions. Following the class, the student should reread the material and work with the Checkpoint Exercises, Video Notes, and Review Questions and Exercises at the end of assigned chapters in the text to achieve mastery of the subject matter.

Required Texts: Tony Gaddis. Starting Out with C++: From Control Structures through Objects, 8th Ed.
CIS 121 Lab Book (electronic copy provided)

Supplemental Texts: Schneider and Gersting. Invitation to Computer Science (C++ Version), 3rd Ed. (provided)

Course Management: spelelearn.spelman.edu
Programming Practice: http://www.myprogramminglab.com
Textbook Website: www.pearsonhighered.com/gaddis (Video Notes and more)
USB Flash Drive: Highly Recommended for backup and mobility

Method of Instruction

Instruction will consist of classroom lectures, discussions, exercises, laboratories, and assembly programming assignments.

- Assigned Readings: All readings should be completed prior to class time to aid understanding of the material.
- Homework Problems: You are expected to complete problem sets as given. These problems may or may not be found within the textbook, and most problems will require the use of a computer to complete.
- Lab Assignments: You are expected to begin lab assignments during the lab period. For most labs, you will need to complete the assignment on your own time. A lab result with results is required for each lab. Though you will complete your lab assignments in collaboration with a lab partner, you are expected to submit individual lab reports.
- Programming Assignments: It is virtually impossible for you to learn the material in this course without some type of directed hands-on experience. There will be a minimum of ten programming assignments (approximately one per week) for you to complete independently to reinforce the material covered in class. Much of our classroom discussion will be devoted to the concepts, which these programs will utilize. You will be held responsible on tests for the concepts illustrated. Written descriptions of all programming assignments will be provided as the semester progresses. The due date for each assignment will be announced in class, and the assignments must be submitted by the date and time listed on the assignment page. No late assignments will be accepted.

Programming assignments may be submitted via Moodle with the following:

- Each programming assignment must be submitted with: program listing, sample of input data when appropriate, and listing of results (output of compilation or execution phase).

Use of Computers and Mobile Devices during Class Meetings:
During class, students are required to silence mobile devices. Computers may be used to take notes or access class materials, but should never be used for email or shopping. During exams, all mobile devices must be powered down and out of sight.

COURSE GRADING INFORMATION

Evaluation Summary

Exams (3)	30%
Homework	15%
Final Exam	20%
Quizzes	10%
Lab	5%
Lab Final	5%
Final Project	10%

Grading Scale

Numeric	Letter	Numeric	Letter
93 - 100	A	77 - 79	C+
90 – 92	A-	70 - 76	C
87 - 89	B+	60 - 69	D
83 - 86	B	< 60	F
80 – 82	B-		

Tentative weekly course of instruction

Course content may vary from this syllabus to meet the needs of this particular class. Students will be notified in class by the instructor when adjustments to this syllabus are required.

Week*	Topics/Assignments	Lecture Topics
1	Welcome;	Definitions and Intro to Algorithms
2	Gaddis – Ch-1, Appendix D	Expressing Algorithms using Pseudo code & Flowcharts
3 - 4	Gaddis – Ch-2; **Exam 1**	Introduction to C++; Parts of a C++ program; keywords, special characters, identifiers; cout; endl; variables and literals; variable declaration, initialization and assignment; data types: int, char, float, double, bool; string class; arithmetic operators; comments; names constants; programming style
5-6	Gaddis - Ch 3	Expressions and Interactivity; cin stream extraction; arithmetic expressions; order of operations; exponentiation and math functions; combined assignment; algebraic expressions; stream manipulators; cin with strings; getline(); string manipulation/catenation; random numbers; code tracing
7	Gaddis - Ch 4; **Exam 2**	Making Decisions;Relational operators; relational expressions; "if" statements; "if-else ifelse"; statements; nested "if" statements; flags; logical operators: AND, OR, NOT; numeric range checking; menus; comparing characters and strings; switch statements; break statement; variable scope
8	SPRING BREAK	
9	Gaddis - Ch 5, Ch 12	Loops & Files;Increment/decrement operators; while loops; counters; do-while; for loops; nested loops
10-11	Gaddis - Ch 6;	Functions; modular programming; defining/calling functions; function prototypes; function parameters; return values; local/global variables
12-13	Gaddis Ch 7, Ch 8 **Exam 3**	Arrays; Array basics; array element access; initialization; bound checking; loop processing; array function arguments; 2D arrays; N-dimensional arrays
14-15	Gaddis Ch 13	Introduction to classes; Object-oriented programming; classes;

		instantiation; private/public members; member functions; constructors; destructors; overloading constructors; private members; object arrays Final Project Demonstrations Lab Final: Last Lab Day
16	**FINAL EXAM**	

* Once weekly programming assignments and quizzes will be given

Academic Honesty:

At the heart of Spelman College's mission is academic excellence, along with the development of intellectual, ethical and leadership qualities. These goals can only flourish in an institutional environment where every member of the College affirms honesty, trust, and mutual respect. All members of the academic community of Spelman College are expected to understand and follow the basic standards of honesty and integrity, upholding a commitment to high ethical standards. Students are expected to read and abide by the Spelman College Code of Conduct (see the current Spelman College Student Handbook) and are expected to behave as mature and responsible members of the Spelman College academic community. Students are expected to follow ethical standards in their personal conduct and in their behavior towards other members of the community. They are expected to observe basic honesty in their work, words, ideas, and actions. Failure to do so is a violation of the Spelman College Academic Integrity Policy. Violators will be subject to the sanctions outlined in the Spelman College Bulletin.

At Spelman College, academic dishonesty includes but is not limited to submitting work that is not one's own, cheating on quizzes, tests, mid-term and final examinations, and plagiarism. Academic dishonesty will not be tolerated and will be dealt with in accordance with the policy on academic honesty in the Spelman College catalog.

What is cheating?
Cheating can be defined by the following list of actions:
1. Turned in work done by another student
2. If a student copies a programming assignment or written homework assignment that belongs to another student, and turns it in as their own work. Files copied via e-mail, mv, cp, etc. are all considered copies.
3. Helping another student cheat
4. If a student allows another student to get access to a copy of a programming or written assignment, then this student is also cheating. (There are ways to protect yourself in this situation that are discussed in a later section)
5. Copying from another students' exam or helping a student copy your exam
6. Using crib notes on an exam
7. Collaboration (unless otherwise stipulated by your professor, see section on Collaboration)

Collaboration

Collaboration is generally considered cheating, or at the very least puts a student in jeopardy of cheating. If an instructor stipulates that you can collaborate, then this section will define what that means in the CS department at Spelman College. If an instructor stipulates that there is no collaboration, then these definitions do not apply.

Illegal collaboration is when the resulting source code or written answer is very similar to identical:

Scenario #1:
Two students working on the same assignment, and they decide to start writing their ideas and concepts on the board. Next they write pseudo code for the problem on the board which begins to resemble an actual source code solution. They both begin to type in this source code like solution. This is cheating.

Scenario #2:
Student A is having trouble with a concept that is an integral part of the programming assignment. Student A seeks help from Student B. Student B shows Student A the code that is necessary to solve the problem. Student A is able to use this code as their own. This is cheating.

Scenario #3:
Two students are sitting next to each other in the lab working on homework assignments, and they are looking at each other's programs to get ideas and better understanding. This is not collaboration; it's cheating. This does not apply to lab class.

Legal collaboration is when students discuss the concepts & high-level design:

Scenario #4:
Consider Scenario #1 where the students only collaborate on the steps involved in the solution, but do not write source code like pseudo code on the board.

Scenario #5:
Consider Scenario #2 where student A reviews the concepts related to the problem in order to help student B. If student B is still having trouble they should seek the help of the TA or the Instructor.

How to protect yourself from cheaters?

There are many ways that honest students can protect themselves from other students that are dishonest:

1. Creating checkpoints of your progress when writing your programs. This involves periodically making copies of your files naming them in consecutive order.
Suppose the assignment is called prog1.cpp. After you have worked on the program once make a copy of the file called prog1-1.cpp. After the second time,

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call the program prog1-2.cpp. This can be done until the program is completed. This gives you a log of the progress you have made on the assignment, and shows you have done the work.

2. If you have been collaborating with another student beware of eavesdroppers, and do not leave your ideas, concepts, and pseudo code on the board. This will prevent others from using your ideas without your knowledge. In addition, you want to erase the board so that your work is not very similar to the student(s) you are collaborating with. After erasing the board, allow some time to pass before you implement the ideas in your program. This will help ensure that the code you write only uses the concepts discussed earlier, and will keep your code different from other students.

3. Do not leave your computer monitor unattended. Lock your screen using a screen saver that requires a password when you have to leave the monitor unattended for more than a few minutes or so. Do not leave the building with your machine unattended whether the screen is locked or not.

4. Do not allow the same student to look at several portions of your code. This allows someone to slowly obtain your entire code one piece at a time.

What happens to cheaters?
Spelman College guidelines:
1. First violation is a 0 for the assignment or exam, and a warning letter is submitted to the Academic Dean. The warning letter is only acted on by the Academic Dean's office if there is a second violation.
2. Second violation is handled by the Academic Dean's office. You may receive an 'F' in the course and/ or suspension.

For most college classes, students are expected to work independently on projects and assignments. However, for this class certain assignments will be clearly designated for working in groups. For these assignments, each group will turn in one assignment with all names of the group members on that assignment. For all other assignments, students are expected to work independently. In addition to the rules explicitly stated in this syllabus, students shall be governed by the rules of Spelman College; therefore it is the student's responsibility to become
familiar with the rules and regulations of the College.

Evaluation Policy:
Assessments
There will be periodic tests and quizzes given during the semester. Once graded, these tests will not be returned to the student (as per department policy). A student who wishes to see her assessment must do so by appointment with the professor *within 2 weeks* of the posted grade.

Weighting of Tests and Assignments

The elements used to assess student performance will be weighted as indicated in the evaluation summary in the computation of the numerical grade average. All assessment grades will be made available in Moodle. Any averages presented in Moodle represent an estimate of final weighted grades but final determinations will be calculated at the end of the semester by the professor.

Attendance and Tardiness Policy

Students are required to be present and on time for each class and are responsible for all material covered in class whether they are present or absent.

- **Do not** discuss personal absences or circumstances with the professor during class hours. Please see me in my office or schedule an appointment to discuss.
- **Do not** email the instructor if you will be absent. If you need to follow up on materials missed - see me during office hours or schedule an appointment.
- If you have an emergency, please bring substantiated documentation upon your return to campus to my office.
- The instructor may withdraw students with excessive unexcused absences.

When given, quizzes will be administered at the beginning of class.

- Tardy students will not be allowed to take the quizzes.
- No makeup quiz will be given except for excused absences (note the College's excused absence policy below).
- If a student has an excused absence for a test or quiz, she should make arrangements prior to her absence for when she will take assessment. If arrangements are not made prior, they should be made immediately upon return to campus.
- The student should be prepared to take the assessment at the next time available on the schedule for she and the professor.
- Excused absences will not be given for tests and quizzes unless supported by substantiated documentation immediately upon return to campus.

Cell Phone Use/PDAs

Cell phone use for activity not related to course work (talking, texting, browsing, etc) is prohibited. *Please silence all electronic devices during class.*

Late Assignment

No assignments are accepted late unless there was a prior agreement with the professor. The professor has the option to drop the assignment if accepting the assignment late will affect the integrity of the assignment.

Class Cancellation Policy

If for any reason a class is not held at the assigned time, all work scheduled for that day is automatically rescheduled for the next scheduled class period. Any projects, assignments, or homework due on a missed day become due at the next scheduled class period. Similarly, any tests scheduled for a class period which is not held at the assigned time will be given at the next scheduled class period.

Student Access Statement

Spelman College is committed to ensuring the full participation of all students in its programs. If you have a documented disability (or think you may have a disability) and, as a result, need a reasonable accommodation to participate in class, complete course requirements, or benefit from the College's programs or services, you should contact Student Access Center (SAC) as soon as possible. To receive any academic accommodation, you must be appropriately registered with SAC. The SAC works with students confidentially and does not disclose any disability-related information without their permission. SAC serves as a clearinghouse on disability issues and works in partnership with faculty and all other student service offices. For further information about services for students with disabilities, please contact the SAC at 404-270-5289 (voice), located in MacVicar Hall, Room 106.

COLLEGE POLICIES

- Copyright and Fair Use Statement
  - o Copyright laws and fair use policies protect the rights of authors. Copyrighted materials may be used in this class, including articles, music, art work, etc. These materials are provided for private study, scholarship, or research and adhere to the copyright law of the U.S. (Title 17, U.S. Code). You may copy or download from the course website one copy of the materials on any single computer for non-commercial, personal, or educational purposes only, provided that you do not modify it and use it only for the duration of this course. Beyond this use, no material from the course or website may be copied, reproduced, re-published, uploaded, posted, transmitted, or distributed in any way without the permission of the original copyright holder. The instructor nor the College assumes any responsibility for individuals who improperly use copyrighted material.
- Incomplete Policy
  - o An Incomplete (IP) is assigned to a student when extenuating circumstances (e.g., illness, death of an immediate family member, or family emergency) prevent a student who is passing a course from completing the final examination or final assignment(s) by the end of the semester. In consultation with a Dean, the faculty member determines if an Incomplete is appropriate and completes the necessary paperwork. The faculty member determines the date for completion of all work. An Incompletion must be changed by the deadline specified on the College academic calendar. A student who cannot complete the Incomplete by the specified deadline must request an extension from the professor, who will notify the Office of the Dean of the extension. If the required work is not completed by the established deadline

or the student is not given an extension, the IP will automatically be changed to an F.

CIS 343/343L
Operating Systems

Spelman College Computer & Information Sciences
Spring 2019
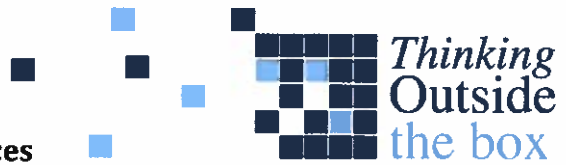
COURSE ADMINISTRATION	
Instructor:	Jerry Volcy, Ph.D. jvolcy@spelman.edu (404) 270-5768
Office Hours:	MF 12:00pm - 2pm and by appointment Science Center, room 314
Course Lecture Hours:	Monday, Wednesday, Friday 11:00a – 11:50a, Tapley 223
Course Lab Hours:	Wednesday 12:00p – 12:50p, Tapley 223

COURSE INFORMATION

Course Description
This course provides an introduction to major concepts in the design of operating systems and the interrelationships between the operating system and the architecture of computer systems. Major topics covered include process and thread management, scheduling and synchronization, memory virtualization, implementation of file systems and management of peripheral devices.

Learning Objectives
Upon completing the course, a student will be able to:
- Evaluate the subsystems of a computer operating system
- Evaluate operating system design choices
- Explain how the computer operating system interacts with users, programs, and hardware
- Describe the facilities and subsystems of a computer operating system
- Implement components of a computer operating system
- Develop system-level software tools and applications

Prerequisites
CIS 215 (Data Structures) and CIS 216 (Computer Organization).

Course Credits: 4

Computer Resources
Most of the computer work done in O/S will be conducted on a virtual machine running Ubuntu Linux. The virtual machine will be provided. While any virtualization engine can be used, this course uses Oracle's VirtualBox which is freely available for download for Macs or PCs from www.virtualbox.org.
   Computer labs in Tapley 223, Tapley 227 and Science Center 230 are available for student use though access to VirtualBox and to the Ubuntu virtual machine is not guaranteed. For this reason, CS students are strongly encouraged to procure a personal laptop computer (preferably a Mac) to provide mobility and ensure access to software and data needed for class.
   Note that while SC 230 is open 24 hours for student use, Tapley 223 and 227 are used as classrooms during the day and are not available for use at such times.

Required Textbooks
   Operating System Concepts Essentials, 2e
   By A. Silberschatz
   ISBN-13: 978-1118804926
   ISBN-10: 1118804929

Method of Instruction
Instruction will consist of classroom lectures, discussions, exercises, laboratories, and Python programming assignments.
   - Assigned Readings: All readings should be completed prior to class time to aid understanding of the material.
   - Homework Problems: You are expected to complete problem sets as given. These problems may or may not be found within the textbook, and most problems will require the use of a computer to complete.
   - Lab Assignments: You are expected to begin lab assignments during the lab period. For most labs, you will need to complete the assignment on your own time. Unless otherwise specified, you are expected to code your lab assignments individually, even if you collaborate with a lab partner in developing the form of the solution. A lab report with results is expected for each lab.
   - Programming Assignments: Programs for this course will be developed in C or C++. Your listing of your program should be included in the appendix of your lab. A compilable copy of the source code should also be submitted along with the lab.

COURSE GRADING INFORMATION

Evaluation Summary

Homework & Quizzes	10%
Exams (2)	30%
Final Exam	20%
Labs	40%

Note that not every assignment will be graded. Assignments selected for grading will be at the sole discretion of the instructor. You should complete and submit every assignment to the best of your abilities. At the instructor's discretion, students who are late for tests and quizzes may not be allowed to take the test or quiz.

Grading Scale

Numeric	Letter
93 - 100	A
90 – 92	A-
87 - 89	B+
83 - 86	B
80 – 82	B-

Numeric	Letter
77 - 79	C+
73 - 76	C
70 - 72	C-
60 - 69	D
< 60	F

COURSE SCHEDULE AND IMPORTANT DATES

Exam Schedule

The instructor retains the right to change the exam schedule as needed.

Exam	Tentative Date
Exam #1	2/20/19
Exam #2	3/27/19
Final Exam	TBD

Tentative weekly course of instruction

The program of study below is meant to serve as an approximate schedule. There are some topics, which may take less time, and other topics, which may take more time depending on the class itself. The instructor retains the right to change the schedule of study as needed. Problem sets associated with each topic will be posted on Moodle.

Week	Topics/Assignments
1	Chapter 1 – Introduction Begin reading 1.1-1.2.1, 1.5-1.5.1
2	Chapter 2 – O/S Structures Introduction; H/W Review; Operating Systems Concepts; System Calls Read 2.1, 2.2, 2.3 - p.64 only, 2.4 (not 2.4.1) & Figure 2.8, 2.10
3 - 4	Chapter 3 – Processes Process Creation/Termination Read 3.1-3.1.3, 3.2, 3.3-3.3.2
5	Chapter 6 – CPU Scheduling Scheduling Algorithms Read 6.1-6.1.1, 6.2-6.3.4 Assignment
6	Chapter 4 – Threads Multithreading Read 4.1, 4.4-4.4.1
7 - 8	Chapter 5 – Process Synchronization mutexes; semaphores Read 5.1-5.2, 5.4-5.6.2, 5.9.4
	Spring Break
9	Chapter 7 – Main Memory Memory Hierarchy; Segmentation; Paging; Page Tables Read 7.1-7.5.1
10-11	Chapter 8 – Virtual Memory Virtual Memory
12-13	Chapter 9 – Mass-Storage Structure
14-15	Chapter 10 – File-System Interface Reading Period
16	Final Exam

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COLLEGE POLICIES

- Excused Absence Policy
  - o Note about granting extensions: While a request may come from the Office of Undergraduate Studies based on information from Health and Counseling Services and/or a verified excused absence, it is the faculty member who determines the length of the extension. It is expected that the faculty member will make reasonable accommodation for the student, who, for circumstances beyond her control, must miss a test or cannot meet the deadline for an assignment.
- Copyright and Fair Use Statement
  - o Copyright laws and fair use policies protect the rights of authors. Copyrighted materials may be used in this class, including articles, music, art work, etc. These materials are provided for private study, scholarship, or research and adhere to the copyright law of the U.S. (Title 17, U.S. Code). You may copy or download from the course website one copy of the materials on any single computer for non-commercial, personal, or educational purposes only, provided that you do not modify it and use it only for the duration of this course. Beyond this use, no material from the course or website may be copied, reproduced, re-published, uploaded, posted, transmitted, or distributed in any way without the permission of

the original copyright holder. The instructor nor the College assumes any responsibility for individuals who improperly use copyrighted material.

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