CSCI 1360: Foundations for Informatics and Data Analytics

Spring 2023 - Section: 59926

Instructor: Sakher Alqaaidi

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Office hours: Tuesdays 01:00 PM – 02:00 PM, Location: Zoom Link on eLC

Lecture Time and Location:

Monday 03:00 PM - 03:50 PM, Dawson Hall | Room 0208

Tuesday and Thursday 02:20 PM - 03:35 PM, Miller Plant Sci | Room 1102

Course Webpage: eLC, GitHub Classroom (Link will be provided)

Brief Course Description

Informatics, or "data science," are rapidly becoming essential skills for scientists across fields; in addition to field-specific specializations, researchers require knowledge of and experience with quantitative analytical techniques for extracting knowledge from raw data.

This course aims to provide an introduction to concepts in scientific programming and data science using the Python language. Students are given hands-on opportunities to learn techniques applicable to quantitative analyses across a broad range of fields. These core techniques involve formulating solutions in terms of their inputs and outputs (functional programming), repeated operations (loops), branching operations (conditionals), different methods of organizing data (data structures), how to implement an optimal problem-solving strategy (algorithm design), and methods for visualizing and interpreting results.

Pre-requisites

MATH 1113 – PreCalculus.

This course assumes no prior programming or statistics knowledge.

Learning Outcomes

- Frame scientific experiments in terms of their inputs and outputs.
- Formulate algorithms in terms of conditionals, loops, functions, return values, data structures, and existing Python APIs.
- Write a program or package to implement automated analysis of data.

- Process data of varying types, such as text or images.
- Render appropriate visualizations of analysis results, and interpret these visualizations.

Topical outline for the course

- Introduction to Informatics
- Introduction to Python
- Data Structures and Loops
- Conditionals and Exceptions
- Functions, File I/O
- Vectorized Programming
- Linear Algebra
- Statistics
- Probabilities
- Data Formats, Transformations, and Preprocessing
- Algorithms: regression, classification, clustering
- Data Visualization
- Computer Vision
- Natural Language Processing

Required Materials

Textbooks:

- VanderPlas, Jake. Python Data Science Handbook: Essential Tools for Working with Data (1st ed., 2016) ISBN: 9781491912058.
- Shaw, Zed. Learn Python the Hard Way (3rd edition, 2013) ISBN-13: 978-0321884916.

* Other material's content will be used in the lectures and references to such material will be provided in the notebooks.

Hardware and Software:

A laptop with any of the following operating systems: Mac OS, Linux or Windows.

Grade Distribution

Assessment Item	Count	Single Assessment Points	Total Grade Weight
Quizzes	4	4	16%
Assignments	6	7.5	45%
Midterm Exam	1	15	15%
Final Exam	1	20	20%
Attendance and Participation	1	4	4%

Letter Grade Breakdown

Letter	Grade
A	100 – 93
A-	92 - 90
B+	89 - 87
B	86 - 83
B-	82 - 80
C+	79 - 77
C	76 - 73
C-	72 - 70
D+	69 - 67
D	66 - 63
D-	62 - 60
F	59 - 0

Assessment dates

Quizzes will be given during class time and on the dates specified in the course schedule that is posted on the course webpage. The course assignments will be released at least one week before the due date, the due dates are specified in the course schedule. Assignment solutions should be submitted through the proper electronic channel specified. In most cases, assignment solutions should be submitted through GitHub Classroom, unless otherwise specified. No email submission will be accepted.

Midterm exam will take place on Thursday, March 2nd during class time, and the final exam will take place on Thursday, May 4th; the exam time and location will be announced later.

All assessment items mentioned above follow the Late/Missed Assessment Policy.

Late/Missed Assessment Policy

No test, quiz makeup or assignment extension will be given without presenting verified proof of emergency, serious medical condition, or mandatory court attendance, otherwise zero will be given to the missed assessment. However, late assignment submissions are accepted within 48 hours after the deadline with 10% of the points deducted if submitted within 24 hours after the deadline, and 20% deducted if submitted after 24 hours and before the late submission window closes. Students are responsible for checking the correctness of their assignments before submitting them. After submitting an assignment, students should double-check that their submission was successful.

Attendance Policy

Attendance is a key factor to success in this course and is the best way to have a clear explanation of the course material and to get answers to your questions. Attendance is required for this course with three unexcused absences allowed during the semester, and to receive the attendance points, the student must not record additional absences.

Email Policy

Please include the keyword [CSCI1360] in the email subject when contacting the instructor, to avoid having the email sent to the junk folder by the email filter. Please give 24 hours waiting period before sending a reminder or receiving a reply during the week working days. Please do not use the eLC email functionality as I do not monitor messages in that folder.

Regrade Request Policy

Any regrade request should be sent to the course instructor via a detailed email within one week after the distribution of the grade.

Academic Honesty

As a University of Georgia student, you have agreed to abide by the University's academic honesty policy, "A Culture of Honesty," and the Student Honor Code. All academic work must meet the standards described in "A Culture of Honesty" found at: http://www.uga.edu/honesty. Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation. Questions related to course assignments and the academic honesty policy should be directed to the instructor.

UGA Student Honor Code: "I will be academically honest in all of my academic work and will not tolerate academic dishonesty of others." A Culture of Honesty, the University's policy and procedures for handling cases of suspected dishonesty, can be found at www.uga.edu/ovpi.

Accommodations for Disabilities

If you plan to request accommodations for a disability, please register with the Disability Resource Center. They can be reached by visiting Clark Howell Hall, calling 706-542-8719 (voice) or 706-542-8778 (TTY), or by visiting http://drc.uga.edu.

Mental Health and Wellness Resources:

If you or someone you know needs assistance, you are encouraged to contact Student Care and Outreach in the Division of Student Affairs at 706-542-7774 or visit https://sco.uga.edu/. They will help you navigate any difficult circumstances you may be facing by connecting you with the appropriate resources or services.

UGA has several resources for a student seeking mental health services (https://caps.uga.edu/wellbeing-prevention-programs-mental-health/) or crisis support (https://healthcenter.uga.edu/emergencies/).

If you need help managing stress anxiety, relationships, etc., please visit BeWellUGA (https://caps.uga.edu/well-being-prevention-programs-mental-health/) for a list of FREE workshops, classes, mentoring, and health coaching led by licensed clinicians and health educators in the University Health Center.

Additional resources can be accessed through the UGA App.

Disclaimer: The course syllabus is a general plan for the course; deviations announced to the

class by the instructor may be necessary.