

ITE 622: Programming for Data Analytics II,
University of Nevada, Las Vegas

Instructor

Name:
Office:

Phone:
Email:

Course Objectives

This course provides a broad introduction to techniques used in data analytics by building on the foundations given in ITE 621. Topics include: supervised learning such as linear regression, binary classification, support vector machines, neural networks, deep learning, and unsupervised learning such as clustering and dimensionality reduction.

The course focuses on the practical application of these tools and discusses recent applications of data analytics with a focus on business, health, bioinformatics, OCR, text and web data processing. 3 credits.

Prerequisite: ITE 621: Programming For Data Analytics I or instructor consent

Learning Outcomes

After completing this course, you will be able to:

- Demonstrate a mastery of in-depth knowledge of fundamental and basic statistical principles.
- understand a variety of machine learning algorithms and their strength and weaknesses.
- Apply machine learning to a large variety of data sets.
- Formulate, update, and communicate results obtained from data.

Schedule of Topics

RDBMS & SQL		
Week 1	Python, MySQL (connector)	
Week 2	Regular Expressions: RegEx	
Week 3	Intro to Scikit Learn	
Week 4	Linear Regression	
Week 5	Binary Classification	
Week 6	Support Vector Machines and OCR	
Week 7	Neural Networks	
Week 8	Deep Learning	
Week 9	Review & Mid-Term Exam	
Week 10	Tensorflow	
Week 11	Keras	
Week 12	Intro to Web Data Processing	
Week 13	Web Data Processing	
Week 14	Applications in Health and Business	
Week 15	Final Presentations	
Final Exam		

Academic Policies

Assignments

There will be approximately 4–8 assignments and random quizzes worth a total 60% of the overall grade.

Exams

There will be a mid-term exam (worth 10% each) and a final exam and project (worth 30%).

Grade Values

Course grades will be assigned according to the following table (normal rounding will be used, and no curve will be applied):

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

Grading Criteria

Each homework assignment will be worth 100 points. All grades are subject to the discretion of the instructor, but in general grades will adhere to the following scheme:

- All assignments must be turned in on time. No late assignments will be accepted without prior approval from the instructor. Follow the UNLV Canvas Posted Deadlines!
- All program submissions must be either a single file named `ite703hw#.py`, where `#` is the assignment number, or `ite703hw#.tgz` or `ite703hw#.zip` for multi-file submissions. For example Assignment 4 would be named `ite703hw4.py`
- All programs must execute successfully on `sally.cs.unlv.edu` with no errors or warnings using `g++`. Programs that do not run and terminate will receive a 0.
- All programs will be run through Stanford's *Measure of Software Similarity* (MOSS). MOSS is a software program that detects whether or not source code has been plagiarized. Any programming assignments that reflect on MOSS as being very similar will be handled in accordance with the University's Student Academic Misconduct Policy, located at:

<http://studentconduct.unlv.edu/misconduct/policy.html>

- Any program that generates an infinite loop, segmentation fault, or core dump will receive, at a minimum, a 60 pt deduction. If the offending code is a topic which we are actively studying (i.e., your program generates a segmentation fault due to faulty pointer manipulation), then the 60 pt deduction will apply. However, if the offending code is something which you should already know (i.e., your program has a count-controlled loop that never terminates), then the program will receive a 0.

- **Coding style & documentation - 20%**

- (5 pts) All program submissions must have the correct file type, be named correctly, and have the following comment block at the top of their main program file:

```
/*
 * Name: Your name, NSHE ID number, Assignment number
 * Description: a brief description of the program.
 * Input: expected input to the program.
 * Output: expected output of the program.
 */
```

- (5 pts) All programs must utilize the K&R coding style.
- (5 pts) All functions and classes must have the following required documentation immediately above the function/class definition:

```
/*
 * function_identifier: brief description of what the function does.
 * parameters: what to pass into the function
 * return value: what the function returns, if any
 */
```

```
/*
 * class_identifier: brief description of the class
 * constructors: a vertical list of constructor prototypes
 * public functions: a vertical list of public function prototypes
 * static members: a vertical list of any static members
 *                 (variables and function prototypes)
 */
```

- (5 pts) All programs must have reasonable comments throughout the program that adequately convey what is going on the program (where it is not obvious to a stranger reading the code).

- **Syntax & general knowledge - 20%**

- (5 pts) All variables, functions, & classes must have meaningful identifiers.
- (5 pts) All programs will avoid the use of global variables.
- (5 pts) All programs will refrain from using hard-coded values in the program; use named constants instead. Constant identifiers should be meaningfully named and should be in all caps with separate words using underscores.
- (5 pts) No Standard Template Library (STL) containers are allowed in program submission except where specifically authorized. If an STL container is allowed for an assignment, then it is allowed for only that assignment and not for any subsequent assignments, unless specifically authorized.

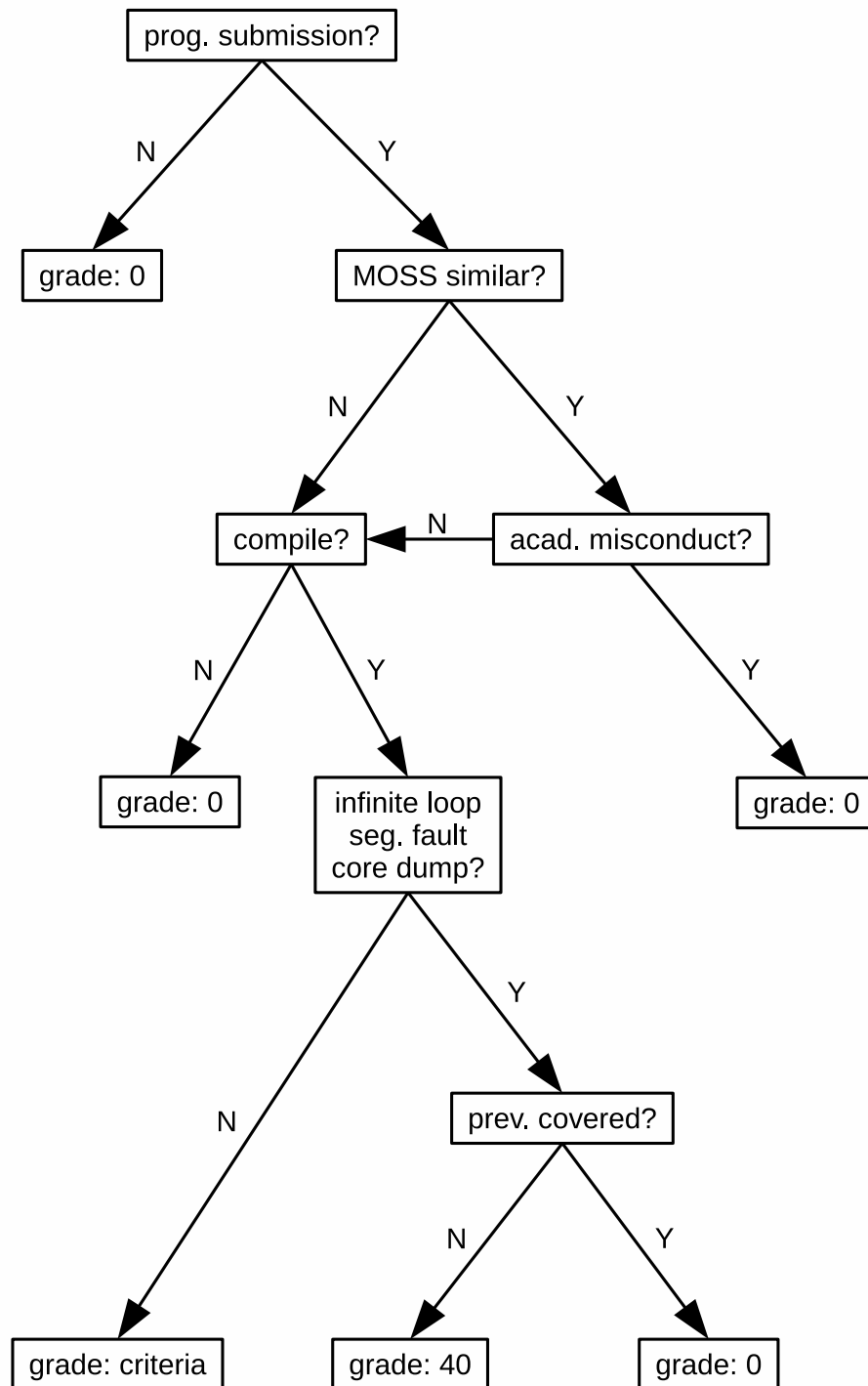
- **Program solution - 60%**

- (10 pts) You must create reasonable functions, classes, and algorithms for appropriate sections of your program.
- (40 pts) All programs must use all required techniques, data types, and data structures addressed in each assignment handout.
- (10 pts) Any required output must have correct values, must not have incorrect values, and must conform to the specified format in the assignment handout.

There will be no make-up exams except as covered under university policies.

Grading Process

The figure below illustrates the grading process used to apply the listed criteria above in order to arrive at a grade for each homework submission:



Student Collaboration

All students must submit their own work. Apart from formulating an assignment solution by one's self, acceptable sources of problem-solving input are limited to: instructor input, teaching assistant input, in-class examples, class web site examples, examples from the textbook, and official reference documentation. External information like StackOverflow may be useful to clarify or review concepts discussed in class, but never copy and paste code from StackOverflow as a solution to your assignment. That is plagiarism.

Due to the nature of this course, collaboration among students is not allowed. Student collaboration is defined as two or more students working together as a group to produce a programming solution. Student collaboration may involve, but is not limited to, asking other students to provide solutions for a programming assignment, copying code from other students, distributing code to other students, or copying, soliciting, or distributing programming solutions to or from third-party sources (online forums or bulletin-boards, outside help from non-students, students from other classes, software repositories, etc.). Programming Assignments are property of UNLV and your instructor. You may not distribute or share the content with anyone outside of your class without prior permission from your instructor and UNLV's Copyright Office.

Note, this policy does not prohibit or discourage discussion among students involving the material covered in class. This policy is simply intended to discourage those who are not willing to make an honest effort at learning the various programming solutions we will encounter during the semester. Study groups for exams are encouraged.

The grading policies for this course are designed to take into account the potential for unethical student collaboration should any violations occur. Thus, even if a student successfully violates this student collaboration policy, does not get caught, and gets perfect marks on his or her programming assignments, that student must still demonstrate his or her competency to a satisfactory level on the exam portions of the class. This is why the exams are worth 50% of the class grade. Each student must do his or her own work! If after completion of this course a student is found to have shared their work with future students in the course. A student may have their grade revoke and possibly their degree revoked. Do not post your solutions on a github portfolio for others to find as you will both be in trouble! This has happened before!

Should the need arise to deal with unethical student collaboration during the semester, the student(s) involved will be referred to the Office of Student Conduct under the [Student Academic Misconduct Policy](#). The general recommendation in this course for this policy is for the student to receive a 0 for that assignment for the first offense and a failing grade for the course for any subsequent offense.

University Policies

The following University policies are applicable:

Public Health Directives— Face coverings are mandatory for all faculty and students in the classroom. Students must follow all active UNLV public health directives while enrolled in this class. UNLV public health directives are found at <https://www.unlv.edu/coronavirus/health-requirements>. Students who do not comply with these directives may be asked to leave the classroom. Refusal to follow the guidelines may result in further disciplinary action according to the UNLV Student Conduct Code, https://www.unlv.edu/sites/default/files/page_files/27/StudentConduct-Code.pdf, including being administratively withdrawn from the course.

Academic Policies: <https://catalog.unlv.edu/content.php?catoid=29&navoid=7326>

Student Services & Activities: <https://catalog.unlv.edu/content.php?catoid=29&navoid=7331>

University Policies: <https://catalog.unlv.edu/content.php?catoid=29&navoid=7332>

University Community & Libraries: <https://catalog.unlv.edu/content.php?catoid=29&navoid=7322>

Academic Misconduct— Academic integrity is a legitimate concern for every member of the University community. We all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility, and professionalism. By choosing to join the UNLV community, students accept the expectations of the Student Academic Misconduct Policy, and are encouraged to always take the ethical path whenever faced with choices. Students enrolling at UNLV assume the obligation to conduct themselves in a manner compatible with UNLV's educational mission. An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another person, from the Internet or any other source without proper citation of the source(s). See the Student Conduct Code, <https://www.unlv.edu/studentconduct/student-conduct>.

Auditing Classes— Auditing a course allows a student to continue attending the lectures and/or laboratories and discussion sessions associated with the course, but the student will not earn a grade for any component of the course. Students who audit a course receive the same educational experience as students taking the course for a grade, but will be excused from exams, assessments, and other evaluative measures that serve the primary purpose of assigning a grade.

Classroom Conduct— Students have a responsibility to conduct themselves in class and in the libraries in ways that do not interfere with the rights of other students to learn, or of instructors to teach. Use of devices such as pagers and cellular phones, or potentially disruptive activities are only permitted with the prior explicit consent of the instructor. Students are specifically prohibited to record classes without instructor authorization, including online/remote classes (either audio only, or video and audio). The instructor may rescind permission at any time during the class. If a student does not comply with established requirements or obstructs the functioning of the class, the instructor may initiate an administrative withdrawal of the student from the course. Since the COVID-19 pandemic forced most instruction to be delivered remotely starting on March 2020, numerous students have asked instructors to record their synchronous classes, so that they can access them at their convenience. Instructors who agree to record their classes (audio only, or video and audio) should inform students in advance. Recorded lectures may not be broadly released to anyone, but made available exclusively to those students enrolled in the class during the particular academic term. Recorded lectures must be stored securely, and are subject to the Nevada System of Higher Education's Records Retention Policy, meaning that the recordings can only be deleted 120 days after the end of class (i.e., after grades are posted). Once this requirement is met, the recordings should be deleted. Class recordings are protected from disclosure, as they are deemed part of an educational record under the Family Educational Rights and Privacy Act (FERPA).

Copyright— The University requires all members of the University Community to familiarize themselves with, and to follow copyright and fair use requirements. You are individually and solely responsible for violations of copyright and fair use laws. The University will neither protect nor defend you, nor assume any responsibility for employee or student violations of fair use laws. Violations of copyright laws could subject you to federal and state civil penalties and criminal liability, as well as disciplinary action under University policies. Additional copyright policy information is available at <https://www.unlv.edu/provost/copyright>.

Disability Resource Center (DRC)— The UNLV Disability Resource Center (SSC-A, Room 143, <https://www.unlv.edu/drc>, telephone 702-895- 0866) provides resources for students with disabilities. Students who believe that they may need academic accommodations due to injury, disability, or due to pregnancy should contact the DRC as early as possible in the academic term. A Disabilities Specialist will discuss what options may be available to you. If you are registered with the UNLV Disability Resource Center, bring your Academic Accommodation Plan from the DRC to the instructor during office hours, so that you may work together to develop strategies for implementing the accommodations to meet both your needs and the requirements of the course. Any information you provide is private and will be treated as such. To maintain the confidentiality of your request, please do not approach the instructor in front of others to discuss your accommodation needs.

Final Examinations— The University requires that final exams given at the end of a course occur on the date and at the time specified in the Final Exam schedule. The Final Exam schedule is typically available at the start of the semester, and the classroom locations are available approximately one month before the end of the semester. See the Final Exam Schedule, <https://www.unlv.edu/registrar/calendars>.

Identity Verification in Online Courses— All UNLV students must use their Campus-issued ACE ID and password to log in to WebCampus-Canvas. UNLV students enrolled in online or hybrid courses are expected to read and adhere to the Student Academic Misconduct Policy, <https://www.unlv.edu/studentconduct/misconduct/policy>, which states that acting or attempting to act as a substitute for another, or using or attempting to use a substitute, in any academic evaluation or assignment is a form of academic misconduct. Intentionally sharing ACE login credentials with another person may be considered an attempt to use a substitute, and could result in investigation and sanctions, as outlined in the Student Academic Misconduct Policy. UNLV students enrolled in online courses are also expected to read and adhere to the Acceptable Use of Computing and Information Technology Resources Policy, <https://www.it.unlv.edu/policies/acceptable-use-computing-and-information-technology-resources-policy>, which prohibits sharing university accounts with other persons without authorization. To the greatest extent possible, all graded assignments and assessments in UNLV online courses should be hosted in WebCampus-Canvas or another UNLV-managed platform that requires ACE login credentials for access.

Incomplete Grades— The grade of I (Incomplete) may be granted when a student has satisfactorily completed three-fourths of course work for that semester/session, but cannot complete the last part of the course for reason(s) beyond the student's control and acceptable to the instructor, and the instructor believes that the student can finish the course without repeating it. For undergraduate courses, the incomplete work must be made up before the end of the following regular semester. Graduate students receiving I grades in 500-, 600-, or 700-level courses have up to one calendar year to complete the work, at the discretion of the instructor. If course requirements are not completed within the period indicated, a grade of F will be recorded, and the student's GPA will be adjusted accordingly. Students who are fulfilling an Incomplete grade do not register for the course, but make individual arrangements with the instructor who assigned the I grade.

Library Resources— Librarians are available to consult with students on research needs, including developing research topics, finding information, and evaluating sources. To make an appointment with a subject expert for this class, please visit the Libraries Research Consultation website, <https://guides.library.unlv.edu/appointments/librarian>. You can also ask the library staff questions via chat and text message at <https://ask.library.unlv.edu/>.

Missed Classwork— Any student missing class, quizzes, examinations, or any other class or laboratory work because of observance of religious holidays will be given an opportunity during that semester to make up the missed work. The make-up opportunity will apply to the religious holiday absence only. It is the responsibility of the student to notify the instructor within the first 14 calendar days of the course for Fall and Spring courses (except for modular courses), or within the first 7 calendar days of the course for Summer and modular courses, of their intention to participate in religious holidays which do not fall on state holidays or periods of class recess. For additional information, please visit the Missed Classwork policy, under Registration Policies, on the Academic Policies webpage, <https://catalog.unlv.edu/content.php?catoid=29&navoid=7326>. In accordance with the policy approved by the Faculty Senate regarding missed class time and assignments, students who represent UNLV in any official extracurricular activity will also have the opportunity to make up assignments, provided that the student provides official written notification to the instructor no less than one week prior to the missed class(es). The spirit and intent of the policy for missed classwork is to offer fair and equitable assessment opportunities to all students, including those representing the University in extracurricular activities. Instructors should consider, for example, that in courses which offer a Drop one option for the lowest assignment, quiz, or exam, assigning the student a grade of zero for an excused absence for extracurricular activity is both contrary to the intent of the Faculty Senate's policy, and an infringement on the student's right to complete all work for the course. This policy will not apply in the event that completing the assignment or administering the examination at an alternate time would impose an undue hardship on the instructor or the University that could be reasonably avoided. There should be a good faith effort by both the instructor and the student to agree to a reasonable resolution. When disagreements regarding this policy arise, decisions can be appealed to the Department Chair/School Director, College/School Dean, and/or the Faculty Senate Academic Standards Committee.

Rebelmail—By policy, faculty and staff should e-mail students' Rebelmail accounts only. Rebelmail is UNLV's official e-mail system for students. It is one of the primary ways students receive official university communication such as information about deadlines, major campus events, and announcements. All UNLV students receive a Rebelmail account after they have been admitted to the university. Students' e-mail prefixes are listed on class rosters. The suffix is always @unlv.nevada.edu. Emailing within WebCampus is acceptable.

Tutoring and Coaching—The Academic Success Center (ASC) provides tutoring, academic success coaching and other academic assistance for all UNLV undergraduate students. For information regarding tutoring subjects, tutoring times, and other ASC programs and services, visit <http://www.unlv.edu/asc> or call 702-895-3177. The ASC building is located across from the Student Services Complex (SSC). Academic success coaching is located on the second floor of SSC A (ASC Coaching Spot). Drop-in tutoring is located on the second floor of the Lied Library and College of Engineering TBE second floor.

UNLV Writing Center—One-on-one or small group assistance with writing is available free of charge to UNLV students at the Writing Center, located in CDC-3-301. For more information: <http://writingcenter.unlv.edu/>

Course Communication

Students are encouraged to contact me at any time with questions regarding the class material. See the beginning of this syllabus for my contact information and office hours.

Normal class activity will take place on the course web site via the official [UNLV Canvas Site](#). The UNLV Canvas Site will be utilized for assignment handouts, grading, announcements, and discussion forum postings. For example, class announcements will be posted in the Discussion Forum area, and assignments will be posted in the weekly sections of the web site. It is of critical importance that you check The UNLV Canvas Site regularly for updates regarding deadlines and other time sensitive content. I highly recommend you to setup e-mail notifications for all activity.

Discussion Forum Guidelines

While there are a variety of publicly-available bulletin-board and forum web sites, the primary location for such activity is restricted to the UNLV Canvas Site. The Discussion Forum is there to encourage online discussion for general problem areas and questions over the material covered in class. This presents a challenge in navigating the necessity of being able to freely discuss the course material while balancing the requirements of academic integrity standards. Thus, the following guidelines apply for online class postings in the Discussion Forum area:

- Posting code directly from assignments is prohibited, unless that code has already been distributed to the entire class or the instructor request certain segments of the code to be posted.
- Posting general solution steps is prohibited
- Asking general questions about how a certain aspect of a program works is allowed and encouraged.
- Answering such questions posted by others is allowed (and encouraged!)
- If you have a question on an assignment and do not know if it's the type of question you can ask your classmates, post it in the discussion board and have them answer you there. This public communication enables transparency to avoid anything being misinterpreted as a violation of the academic conduct rules.
- Remember, if you have a question, odds are others have the same question too. Asking questions publicly allows others to benefit from the answer. Because of this I will not answer homework questions via e-mail. All questions must be posted on the discussion boards.
- To clarify the above, if you have a question regarding a grade or personal information, you should send a private e-mail, but general homework help/questions must be asked in the discussion board or discussed in person. Please come to office hours! I enjoy helping you!

Acknowledgement of Syllabus Contents and Expected Academic Behavior

Please complete and return the following form signed. Your signature states that you have read, understood, and accepted the policies stated in the entirety of this syllabus. Acceptance is a requirement for enrollment in this course. If you do not agree with these terms please drop the course. Failure to not return this document signed will result in removal from the course with the possibility of no refund.

I, _____, understand and agree with the terms and conditions stated in this syllabus for the _____ class, section _____, and will comply with all of its policies.

NSHE ID Number: _____

Date: _____ / _____ — 20_____

Signature: _____