GsAL Certification 2016-2017 Assessment

Univeristy of San Francisco

This document contains the most current description of USF's GsAL GIS Certification Assessment. These offerings will change over time, so the most current version of this document has precedence. Please Check the Date.

Contact: David Saah dssaah@usfca.edu
Date: 12/01/2017

CONTENTS

DESCRIPTION OF THE GEOSPATIAL ANALYSIS LAB (GsAL)

Geospatial Analysis Lab (GsAL) provides education and support for all GIS based learning at the University of San Francisco. The aim of the GsAL is to provide members of our community with a comprehensive understanding of geographic technologies and techniques including, but not limited to ESRI's ArcGIS, Google's Earth Engine, web mapping applications, and remote sensing. In addition,
the GsAL provides GIS consultations and project management for students, staff, faculty and external parties pursuing independent projects and research programs. Development of the USF's GsAL is composed of four main elements that are being cultivated using a phased approach. The four elements include Education, Research, Internal Presence, and External Presence.

- **Education** includes the development of classes that can be utilized by current degree-seeking students from several departments both at the graduate and undergraduate level. ***This is to be complemented by a certificate program that can be utilized by nondegree students.*** The certificate program offers courses for industry specific topics such as ESRI's ArcGIS, LiDAR and Google's Earth Engine.

- **Research** focuses on the disciplines that utilize geospatial analytics and aims to reach out to disciplines that can be integrated into existing efforts.

- **Internal Presence** incorporates building a geospatial community of practice within and between departments at USF.

- **External Presence** focuses on leveraging existing external relationships to position USF as a premier GIS research and training institution within specific disciplines.

GsAL GIS CERTIFICATION PROGRAM ASSESSMENT

IDENTIFICATION INFORMATION

1: Name of Program: **GIS Certification**

2: Type of Program: **Form A and Form B Certification**

3: College of Arts and Science Division: **Sciences**

4: Name/Title/E-Mail Address of Submitter**:**
David Saah, Associate Professor and Director of GsAL, dssaah@usfca.edu

5: Name/Title/E-Mail Address of Additional Individuals Who Should Receive Feedback:
Tracy Benning, Associate Professor, tlbenning@usfca.edu

GSAL GIS CERTIFICATION MISSION STATEMENT

The Geospatial Certification program provides students with a project based curriculum teaching the latest geospatial technologies and applications that allow certificate recipients to pursue cutting edge geospatial technology jobs.

PROGRAM LEARNING OUTCOMES (PLOS)

PLO 1: Demonstrate a mastery of concepts in geospatial science

PLO 2: Demonstrate proficiency in multiple geospatial science technologies

PLO 3: Apply scientific methodology to a geospatial based question and/or issue

PLO 4: Skillfully communicate geospatial topics through written reports, oral presentations and/or multimedia displays

CURRICULUM MAPS

PLO TO COURSE CURRICULUM

	Status	PLO 1: Demonstrate a mastery of concepts in geospatial science	PLO 2: Demonstrate proficiency in multiple geospatial science technologies	PLO 3: Apply scientific methodology to a geospatial based question and/or issue	PLO 4: Skillfully communicate geospatial topics through written reports, oral presentations and/or multimedia displays
GIS 1	Active	X			
GIS 2	Active	X		X	X
GIS 3	Active	X		X	X
1: Geotechnologies	Active	X	X		X
2: Google Earth Engine	Active	X	X	X	X
3: Web Mapping	Active	X	X	X	X
4: GeoHydrology	Planned	X	X	X	X
5: Urban Planning	Planned	X	X		X
6: LiDAR	Active	X	X	X	X
7: Google Geo Tools	Active	X	X		X
8: Geostatistics	Planned	X	X	X	X
9: Public Health	Active	X	X	X	X
10: Intro Remote Sensing	Active	X	X	X	X
11: GIS Practicum	Active	X	X	X	X
12: Drone Technologies	Planned	X	X	X	X

PLO TO ILO CURRICULUM MAP

	PLO 1: Demonstrate a mastery of concepts in geospatial science	PLO 2: Demonstrate proficiency in multiple geospatial science technologies	PLO 3: Apply scientific methodology to a geospatial based question and/or issue	PLO 4: Skillfully communicate geospatial topics through written reports, oral presentations and/or multimedia displays
ILO 1—Students reflect on and analyze their attitudes, beliefs, values, and assumptions about diverse communities and cultures and contribute to the common good.			X	X
ILO 2—Students explain and apply disciplinary concepts, practices, and ethics of their chosen academic discipline in diverse communities.	X	X	X	X
ILO 3—Students construct, interpret, analyze, and evaluate information and ideas derived from a multitude of sources.		X	X	X
ILO 4— Students communicate effectively in written and oral forms to interact with their personal and professional communities.			X	X
ILO 5— Students use technology to access and communicate information in their personal and professional lives.	X	X	X	X
ILO 6— Students use multiple methods of inquiry and research processes to answer questions and solve problems.		X	X	X
ILO 7— Students describe, analyze, and evaluate global interconnectedness in social, economic, environmental and political systems that shape diverse groups within the San Francisco Bay Area and the world.			X	X

ASSESSMENT METHOD

15: Which of your Program Learning Outcomes did you assess during 2016-2017?

PLO 4 Skillfully communicate geospatial topics through written reports, oral presentations and/or multimedia displays

16. What student work products did you use to assess your PLO(s)? Pick one or more direct methods from the list below and briefly describe below what specific work product(s) you used.

Other: Final Video Presentation

17. Brief description of student work products used to assess PLOs

Students were required to produces a five-minute video presentation about their Advanced GIS research project.

18. What tools did you use to evaluate the student work product(s) (e.g. rubric, test score)?

Rubric

19. Please upload any tools used to evaluate student work product(s) here in PDF format only. Please use descriptive file names (e.g. "SociologyAssessmentRubric.PDF").

Rubric in Google Form: https://goo.gl/forms/4l2RQt1wcomATLl92 (See Appendix)

20. Who evaluated the student work product? Check all that apply.

FT faculty members who were not instructor(s) of the course(s)

FT faculty members who were instructor(s) of the course(s)

21. Describe the calibration procedure you employed, if any (i.e., how did you assure that faculty raters were consistent with each other in how they rated the student work products):

Three videos were selected for 9 faculty members to assess using a standardized rubric. The resulting scores were normalized within each video and faculty member then compared. The rubric was designed so that a score of 4 or greater (1 being low and 5 being high) was considered meeting the requirements of the PLO.

22. What indirect methods did you employ, if any?

Curriculum/Syllabus Analysis

23. Please indicate and briefly describe what indirect methods you used (and/or attach the survey/script/interview below).

Curriculum/Syllabus Analysis: This method compared the elements described in the syllabus to the products produced and assessed in class with the Final Video being the comprehensive output of the curriculum.

24. Files submitted:

Appendix B

RESULTS

25.   What were the direct data results? *

For each of the graphs below 1 indicates poor and 5 indicates exceptional. The PLO was considered met if the average score was 4 or greater on average between criteria. Individual elements are presented below followed by a summary table.

Title: Catchy is nice, but the number one priority is clarity. Everyone needs to know what this video is about.
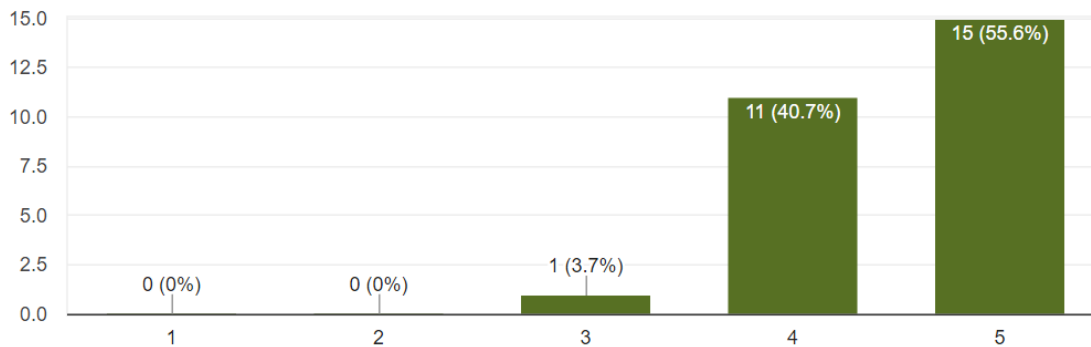
27 responses
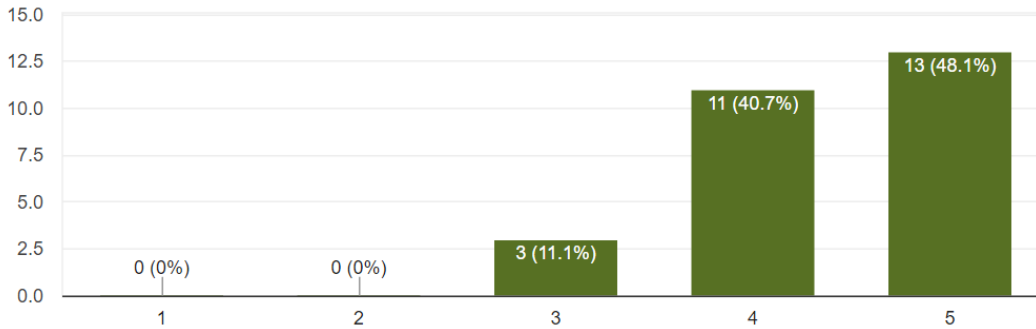
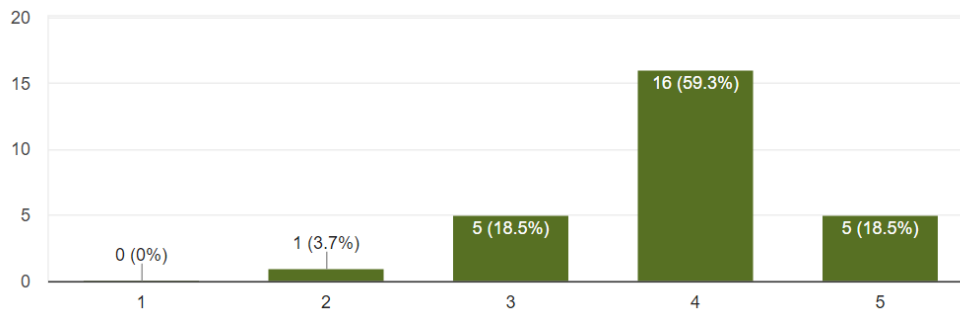Objectives/Research Questions: Clearly state the objective for research

27 responses

Methods: Viewers should come away from this section familiar with the experimental methods and setup, in order to understand the results.
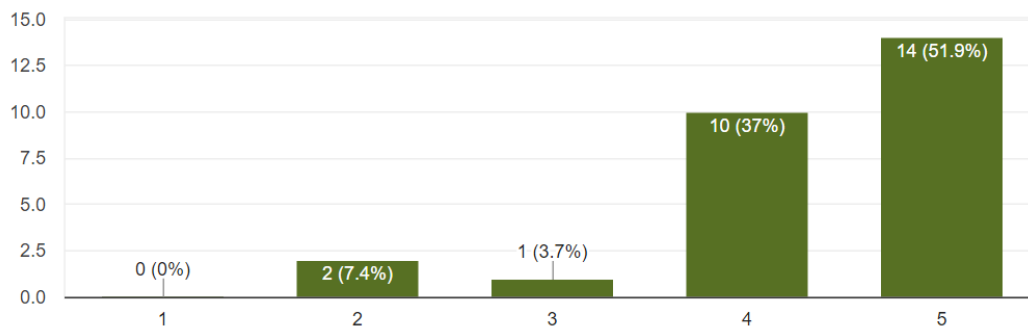
27 responses

Results: Description of major results for each research question
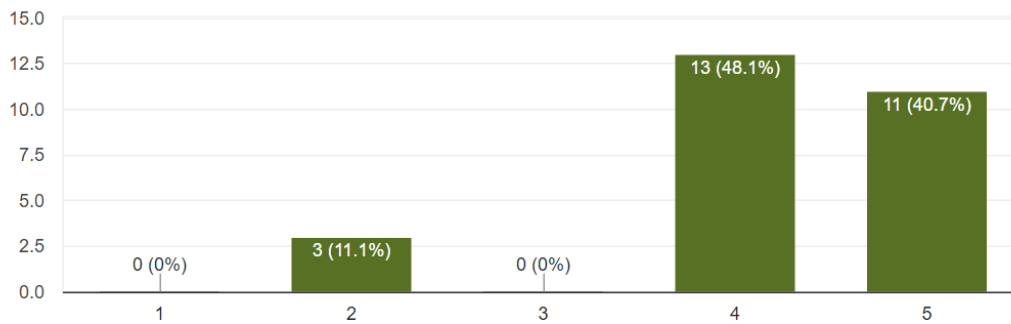
27 responses

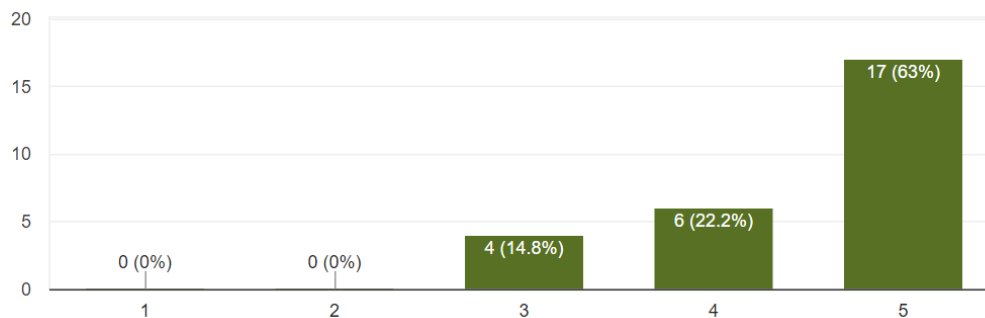## Summary Conclusion of results that highlights potential next steps in research or decision making

27 responses

Story Maps: One of the maps must be relate to a major result that includes all major mapping elements (north arrow, legend, title)

27 responses

Criteria	Percentage Rated 4 or above
Title: Catchy is nice, but the number one priority is clarity. Everyone needs to know what this video is about.	**89%**
Objectives/Research Questions: Clearly state the objective for research	**96%**
Methods: Viewers should come away from this section familiar with the experimental methods and setup, in order to understand the results.	**78%**
Results: Description of major results for each research question	**89%**
Summary: Conclusion of results that highlights potential next steps in research or decision making	**89%**
Story Maps: One of the maps must be relate to a major result that includes all major mapping elements (north arrow, legend, title)	**85%**
Average	**88%**

26.   What were the indirect data results? (If applicable)

All the elements of the syllabus were recoded and assessed in the class with an average of B or higher for each specific element.

27.   How do you interpret these results? What do they mean? *

The results clearly demonstrate that students completing Advanced GIS can skillfully communicate complex geospatial scientific topics in an accessible format based on a majority score of four or above on six defined criteria (see table above). This is the first year that this assessment was completed with plans to replicate it in a couple of years to assess change.   It is also clear from the results that more effort will be given to assisting students with their ability to describe complex methodology to an intelligent lay audience.

CLOSING THE LOOP

28. Which of the following actions did you take as a result of the assessment results? Pick one or more and briefly describe below.

Other: Reflection and review of results in a GsAL faculty meeting.

29. Please elaborate on your potential course(s) of action, related to any/all items you checked above. *

Given that this was the first time this assessment was completed, it was important to GsAL faculty that we can create an ongoing assessment plan that allows students to engadge with the process. One idea that was mentioned was giving students the ability to complete the rubric for their peers during the final presentations.

APPENDIX A: ASSESSMENT RUBRIC

GsAL Assessment PLO4 2017

Hello,

This form will be used to asses the GsAL 4th PLO: Skillfully communicate geospatial topics through written reports, oral presentations and/or multimedia displays. You will be given a link to 3 videos, please watch them, then fill out the following form. Feel free to call or email if you have any questions

Thank you for your help on this....

David and Tracy

VIDEO 1: https://youtu.be/UI_I7350vHo

VIDEO 2: https://youtu.be/kzcXtiy5jmM

VIDEO 3: https://youtu.be/WAEKuMdsG6Q

* Required

Email address *

Your email

Which video is this form for *

Choose ▼

Title: Catchy is nice, but the number one priority is clarity. Everyone needs to know what this video is about. *

	1	2	3	4	5	
Not descriptive	○	○	○	○	○	Catchy and clear

Objectives/Research Questions: Clearly state the objective for research *

	1	2	3	4	5	
No idea what this video is about	○	○	○	○	○	Well defined research question

Methods: Viewers should come away from this section familiar with the experimental methods and setup, in order to understand the results. *

	1	2	3	4	5	
No idea what they did	○	○	○	○	○	Understanding of general method

Results: Description of major results for each research question *

	1	2	3	4	5	
No description	○	○	○	○	○	Clear description of result as it relates to research question

Summary Conclusion of results that highlights potential next steps in research or decision making *

	1	2	3	4	5	
No conclusion	○	○	○	○	○	Clear next steps and/or

recomendation
s

Story Maps: One of the maps must be relate to a major result that includes all major mapping elements (north arrow, legend, title) *

	1	2	3	4	5	
No maps	○	○	○	○	○	Maps clearly related to results

Comments

Your answer

A copy of your responses will be emailed to the address you provided.

Page 1 of 1   SUBMIT

Never submit passwords through Google Forms.

Course Name: GIS III: Advanced to GIS for Environmental Management

Course Title: GIS III: Advanced GIS Env. Mgmt.

Course Number: ENVM-675

Credit Hours: 2 UNITS

Instructor Information: **David S. Saah, Ph.D.**

Associate Professor & Director of the GsAL

Department of Environmental Science

Office: 415 422-4316

cell: 510 427-3571 (9am – 10pm M-Sat)

email: dssaah@usfca.edu

Office Hours: Wednesdays 1:00 pm – 4:00 pm HR 510B or by Appointment

Course Meetings: Duration: August 24 – October 12

    Room: HR 104

    Lecture /Lab: Thursdays 6:30-9:30 pm

Prerequisite Knowledge and Skills: ENVM-673: GISI, ENVM-674: GIS II, General computer literacy with proficiency with Microsoft Windows ® and Microsoft Office ®, Mac users must be able to run windows os in order to complete homework assignments

Course Description: This course trains students on the advanced use of GIS to support spatial inquiry and decision making for environmental scientist. Students strengthen their applied technical GIS knowledge including the inception, design, implementation, and presentation of an environmental project.

Learning Goals and Objectives:

Automate specific GIS tasks

Perform advanced geo-statistical analysis.

Use geospatial information technology, tools, and strategies to solve problems pertaining to environmental science.

Generate maps for reports and presentations, using existing spatial data.

Provide experience working in teams to solve reality-based spatial problems.

GsAL GIS Certification:

The Geospatial Analysis Lab's (GsAL) GIS certification is attained by learners who complete the core GIS classes (GIS1, GIS 2, and GIS 3) and two GsAL GIS electives. Digital badges are issued via Open Badge Factory as evidence that learners have attended, participated in, and achieved the learning goals and objectives for the specific certification class. This course qualifies for the GIS 3 core course and the badge issued is illustrated here.

Course Materials:

GIS 3 Digital Lab Workbook

Thumb drive or other backup device Needed to copy GIS data to and from computer labs

Software:

You will need a working copy of ArcGIS to complete your class projects. If you don't have access to a copy, you may receive a free student copy trough USF by sending a request into gsal@usfca.edu.   You will also need Microsoft Office or similar compatible program, Adobe Acrobat and a compression software package to zip files.

Text:

Gorr, Wilpen L., and Kristen S. Kurland. GIS Tutorial I: Basic Workbook

Allen, David. GIS Tutorial 2: Spatial Analysis Workbook

Mitchell, Andy. The Esri Guide to GIS Analysis, Volume 2: Spatial Measurements and Statistics 1st Edition

Allen, David. GIS Tutorial 3: Advanced Workbook

Reading and Assignments:

Course readings and computer exercises will be assigned after the associated lecture session. I highly suggest you read the suggested material and complete the computer assignments to facilitate your assimilation of the material.

Course Sequence:

Session	Date	Topic	Case Study	Class GIS Project
1	24-Aug	Network Analysis	Walkability, Accessibility & Public Transportation	
2	31-Aug	Point Patterns	Forest Fires & Forest Planning for Sensitive Wildlife Species	Project Plan
3	7-Sep	Analytical Display	Environmental Equity and Air Toxins	
4	14-Sep	Spatial Analysis Part 1	Forest Inventory Analysis Part One	Metadata Report
5	21-Sep	Spatial Analysis Part 2	Forest Inventory Analysis Part Two	

6	28-Sep	Model Builder	Wildlife Habitat Analysis	
7	5-Oct	Remote Sensing Intro	Monitoring Land Use Change	
8	12-Oct			Presentation

Evaluation Strategies:

This course will be presented using and integrated set of teaching methods, including lectures, class discussion, laboratory exercises, reports, and individual presentations. Further details are given below.

Class Participation	5%	
Project Plan	5%	
GIS Lab Exercises	45%	**Grading Scale:**
Metadata Report	5%	**A+** 100, **A** 99-92, **A-** 91-89,
White Paper	15%	**B+** 88-86, **B** 85-82, **B-** 81-79,
Final Project Presentation	25%	**C+** 78-76, **C** 75-70, **C-** 69-65,
		F 64 -0

Class Participation (5%): I consider class participation to be a vital part of any learning experience. Therefore, class exercises will be used to promote individual participation and group discussion. When participating in the class, it is most important that you provide well-reasoned thoughts. It is much less important whether other students or I agree with your comments.

Project Plan (5 %): The Project Plan is worth 5% of your final grade and late assignments will be penalized by 20% and assignments more than one week late will not be accepted. The project plan is a 2 page max single spaced paper outlining:

Problem statement, justification

Objectives or research question

Planned Data Sets Needed

Methods: what tools you plan on using and why

GIS Lab Exercises (45 %): The GIS laboratory exercises comprises 45% of your final grade. There will be a close association between material covered in the lecture and lab. Each lab report must be typed with your name in the top right corner of the document and turned in via CANVUS. The document must be named with the lab number and the student's initials (LAB1DSS.doc). The labs are due at the beginning of the following class enforced by the digital time stamp of the document. Late assignments will be penalized by 20% and assignments more than one week late will not be accepted.

Metadata Report (5 %): The Metadata Report is worth 5% of your final grade and late assignments will be penalized by 20% and assignments more than one week late will not be accepted. Metadata is important for finding data and evaluating the data's fitness-for-use. Metadata is important for evaluating and understanding the wide variety of data types and even wider variety of procedures used to produce them. Investigating metadata is the first step in evaluating a dataset to see whether it meets certain criteria necessary in order for it to be integrated with other datasets for purposes of management and analysis. Without metadata, the time required to find, obtain, import, explore and test each potential dataset to determine its fitness-for-use would be prohibitive. Students will be required to develop metadata for all key project data sets according to the fgdc standards. Metadata: this should include a table outlining key metadata for each layer, such as name, projection, datum, scale/resolution, currency (how old is it), source, etc.

White Paper (15 %): The White Paper is worth 15% of your final grade and late assignments will be penalized by 20% and assignments more than one week late will not be accepted. Students are required to write a white paper on their class project. A 5-10 page double spaced paper outlining:

Problem statement, justification	Metadata
Brief literature review	Methods: what tools did you use and why.
Objectives / Research Question	Results and conclusions
Study Area Description	At least two proper maps

Final Project Presentation (25 %): This course emphasizes project design. The final project presentation is worth 25% of your final grade. Students will organize groups to work on data exploration, project design, GIS applications and final project presentations or in special circumstances; students may work individually with instructor approval of data and project design. Several general topics, based on specific data sets, are suggested for students to gather or create data, manipulate and modify data that will reflect a meaningful question or objective. The final examination for this course will consist of a 5 minute video presentation. Your presentation will be a significant topic of your choosing relating to environmental science. Specific details will be provided during the class sessions.

Communication Center: A class list with contact information for all members of the class will be distributed (pending agreement by the class), and networking between students is encouraged.

Academic Honesty: The University of San Francisco expects the highest standards of academic honesty and integrity. This precludes engaging in, causing, or benefiting from any aspects of cheating on assignments or examinations, plagiarism (intentionally or knowingly representing the words or ideas of another as one's own in any academic exercise), forgery, multiple submissions of the same paper, or any other such activities are not in accord with professional ethics and behavior. Any assignment found not to be in the student's own words will be marked zero.

Attendance Policy: Participation in all class meetings is a requirement of the course. Students missing more than one meeting will not qualify to pass the course. Exceptions can only be made in extenuating circumstances. Students who need to miss a class for a valid reason must inform the instructor in advance and submit a 500 -1000 word review of the class and intended learning outcomes within two weeks of the class meeting**.**

Academic Integrity: The University of San Francisco Is a Jesuit institution committed to *cura personalis* — the care and education of the whole person — USF has an obligation to embody and foster the values of honesty and integrity. USF upholds the standards of honesty and integrity from all members of the academic community. All students are expected to know and adhere to the University's Honor Code. You can find the full text of the code online at https://myusf.usfca.edu/academic-integrity. The policy covers:

Plagiarism: intentionally or unintentionally representing the words or ideas of another person as your own; failure to cite references properly; manufacturing references.

Working with another person when independent work is required.

Submission of the same paper in more than one course without the specific permission of each instructor.

Submitting a paper written by another person or obtained from the internet.

The penalties for violation of the policy may include a failing grade on the assignment, a failing grade in the course, and/or a referral to the Academic Integrity Committee.

Students with Disabilities: If you are a student with a disability or disabling condition, or if you think you may have a disability, please contact USF Student Disability Services (SDS) at 415 422-2613 within the first week of class, or immediately upon onset of disability, to speak with a disability specialist. If you are determined eligible for reasonable accommodations, please meet with your disability specialist so they can arrange to have your accommodation letter sent to me, and we will discuss your needs for this course. For more information, please visit https://www.usfca.edu/student-disability-services or call (415) 422-2613.

Learning and Writing Center: The Learning & Writing Center provides assistance to all USF students in pursuit of academic success. Peer tutors provide regular review and practice of course materials in the subjects of Math, Science, Business, Economics, Nursing, and Languages. Other content areas can be made available by student request. To schedule an appointment, log on to TutorTrac at https://tutortrac.usfca.edu. Students may also take advantage of writing support provided by Rhetoric and Language Department instructors and academic study skills support provided by Learning Center professional staff. For more information about these services contact the Learning & Writing Center at (415) 422-6713, email: lwc@usfca.edu or stop by our office in Cowell 215. Information can also be found on our website at https://www.usfca.edu/student-life/learning-writing-center.

Counseling and Psychological Services: Our diverse staff offers brief individual, couple, and group counseling to student members of our community. CAPS services are confidential and free of charge. Call (415) 422-6352 for an initial consultation appointment. Having a crisis at 3 AM? We are still here for you. Telephone consultation through CAPS After Hours is available between the hours of 5:00 PM to 8:30 AM; call the above number and press 2.

Confidentiality, Mandatory Reporting, and Sexual Assault: As an instructor, one of my responsibilities is to help create a safe learning environment on our campus. I also have a mandatory reporting responsibility related to my role as a faculty member. I am required to share information regarding sexual misconduct or information about a crime that may have occurred on USFs campus with the University. Here are other resources:

To report any sexual misconduct, students may visit Anna Bartkowski (UC 5th floor) or see many other options by visiting our website: https://myusf.usfca.edu/title-ix

Students may speak to someone confidentially, or report a sexual assault confidentially by contacting Counseling and Psychological Services at 415-422-6352.

To find out more about reporting a sexual assault at USF, visit USFs Callisto website at https://usfca.callistocampus.org/ .

For an off-campus resource, contact San Francisco Women Against Rape (SFWAR) (415) 647-7273 (www.sfwar.org).

Student Accounts – Last day to withdraw with tuition reversal: Students who wish to have the tuition charges reversed on their student account should withdraw from the course(s) by the end of the business day on the last day to withdraw with tuition credit (census date) for the applicable course(s) in which the student is enrolled. Please note that the last day to withdraw with tuition credit may vary by course. The last day to withdraw with tuition credit (census date) listed in the Academic Calendar is applicable only to courses that meet for the standard 15-week semester. To find what the last day to withdraw with tuition credit is for a specific course, please visit the Online Class Schedule at https://myusf.usfca.edu/onestop/registration/class-schedule-final-exams.