**STA537: Advanced SAS Programming Winter 2022**

**Modality:**

This course will be a distance education (DE) class, taught asynchronously. All class materials and assignments will be accessible remotely via the D2L class management system. There will be no in-person attendance requirements.

**Instructors**: Dr. Bob Gallop

Dr. Randall H. Rieger

**Class Website:** d2l.wcupa.edu

**Required Texts**: None

**Office Hours:** January 3 – January 12: Tuesday: 12:30-1:30 PM

Wednesday: 6:00-7:30 PM

Thursday: 1:00-2:00 PM

Link: <https://wcupa.zoom.us/j/99772192141?pwd=cGI1b0YxdGxtSXF1ZGNPVGpJSHFDQT09>

Meeting ID: 997 7219 2141

Password: WINTERSTAT

January 13 – January 20: TBD

**Supplemental Texts**:

Carpenter, Art. 2004. *Carpenter’s Complete Guide to the SAS Macro Language, 2nd edition*. Cary, NC: SAS Institute

Delwiche and Slaughter, 2012. *The Little SAS Book*, *5th edition*, SAS Publishing, Cary, NC

Dinsmore, Paul. 2007. *SAS Base Programming Certification Study Guide* (may be downloaded free of charge at<http://www.cs.wcupa.edu/~pdinsmore/sasbook.zip> )

Prairie, Katherine. 2005. *The Essential Proc SQL Handbook for SAS Users*. Cary, NC: SAS Institute.

SAS Institute Inc. 2011. *SAS Certification Prep Guide: Advanced Programming for SAS 9, 3rd edition*. Cary, NC: SAS Institute

SAS Institute, Inc. 2004. *SAS Macro Language: Reference, Version 9*. Cary, NC: SAS Institute.

Schreier, Howard. 2008. *Proc SQL by Example*. Cary, NC: SAS Institute

**Evaluation:**

We have provided two options for evaluation. The Presentation will be due on January 5. Details of presentation topics and requirements will be posted on D2L. If you choose to do a presentation, you must submit a video no later than 5 PM on January 5. This can be a narrated PowerPoint, a video of you presenting, or any other format. Submitting the presentation will automatically enroll you into Option #1. IF you do not submit a presentation by January 5, you will be automatically enrolled in Option #2.

We have decided to give this option to students who may want another evaluation in addition to the traditional exams. However, due to the condensed timeframe of the class, we want to be sure that you are done with the presentations in time to focus on the course material for the 3 week course session; hence, the early due date. If you do not have time prior to the due date or wish to keep the holiday season free of coursework, that is totally fine, and you can opt for Option #2.

Evaluation Option 1: Exam 1 40%

Exam 2 40%

Presentation 20%

Evaluation Option 2: Exam 1 50%

Exam 2 50%

**EXAM 1 will be synchronous, on Zoom, on January 12 at 6 PM.**

**EXAM 2 will be synchronous on Zoom, on January 20 at 6PM.**

Student Learning Outcomes (SLO)

The following are the Student Learning Outcomes for the Applied Statistics Program:

1.         Demonstrated an understanding of probability and statistical inference, including the fundamental laws of classical probability, discrete and continuous random variables, expectation theory, maximum likelihood methods, hypothesis testing, power, and bivariate and multivariate distribution theory.

2.         Demonstrated the ability to apply the elementary methods of statistical analysis, namely

those based on classical linear models, categorical methods, and non-parametric ideas to

perform data analysis for the purposes of statistical inference.

3.         Demonstrated proficiency in the effective use of computers for research data management and for analysis of data with standard statistical software packages, particularly SAS.

4.           Learned to develop and critically assess design of experimental studies and the collection

of data.

5.         Applied one or more methods of statistical inference to a particular area of interest,

particularly the program in the elective concentration.

6.         Gained practical experience in statistical consulting and communicating with non-

statisticians, culminating with interaction with research workers at a local company as part

of the internship practicum.

This course addresses the following Student Learning Outcome (#3) for the Applied Statistics Program:

Course Learning Objectives (CLO)

1. Students will become proficient in SAS SQL Programming. (SLO3)
2. Students will become proficient in SAS Macro Programming (SLO3)
3. Students will learn best practices of programming, including efficiency and memory resource allocation. (SLO3)

Exam 1 will assess Course Learning Outcomes 1 and 3.

Exam 2 will assess Course Learning Outcomes 2 and 3.

Final Project will assess all three Course Learning Outcomes.

Grading Policy

Grade Scale

|  |  |  |  |
| --- | --- | --- | --- |
| **Grade** | **Quality Points** | **Percentage Equivalents** | **Interpretation** |
| A | 4.00 | >94 | Superior graduate attainment |
| A- | 3.67 | 90-93 |  |
| B+ | 3.33 | 87-89 | Satisfactory graduate attainment |
| B | 3.00 | 84-86 |  |
| B- | 2.67 | 80-83 |  |
| C+ | 2.33 | 77-79 | Attainment below graduate expectations |
| C | 2.00 | 74-76 |  |
| C- | 1.67 | 70-73 |  |
| F | 0 | < 70 | Failure |

D grades are not used. Refer to the [Graduate Catalog](https://catalog.wcupa.edu/graduate/) for description of NG (No Grade), W, & other grades.

CLASS RULES

* While you are strongly encouraged to discuss aspects of problems and assignments with classmates, the write-up of all assignments and the actual programming MUST be done independently **under the guidelines of the Honor Code**. If you have questions, Dr. Rieger or the Graduate Assistants will be glad to help you. (See Academic Integrity section below.)

1. On take-home examination assignments, **students must work independently under the guidelines of the Honor Code.** If you have questions, Dr. Rieger will be glad to help you. (See Academic Integrity section below.)
2. Missed exams can only be made up with a valid, verifiable, written university-approved excuse and must be made up within a week of the originally-scheduled exam.
3. Late or missing homework assignments will only be excused by a valid, verifiable, written university-approved excuse.
4. Students engaging in disruptive behavior will be dealt with according to university policy. Students are encouraged to consult the undergraduate catalog for details of this policy: <http://www.wcupa.edu/_INFORMATION/OFFICIAL.DOCUMENTS/Undergrad.Catalog/acpolpro.htm#disruptive>

**ACADEMIC & PERSONAL INTEGRITY**

It is the responsibility of each student to adhere to the university’s standards for academic integrity. Violations of academic integrity include any act that violates the rights of another student in academic work, that involves misrepresentation of your own work, or that disrupts the instruction of the course. Other violations include (but are not limited to): cheating on assignments or examinations; plagiarizing, which means copying any part of another’s work and/or using ideas of another and presenting them as one’s own without giving proper credit to the source; selling, purchasing, or exchanging of term papers; falsifying of information; and using your own work from one class to fulfill the assignment for another class without significant modification. Proof of academic misconduct can result in the automatic failure and removal from this course. For questions regarding Academic Integrity, the No-Grade Policy, Sexual Harassment, or the Student Code of Conduct, students are encouraged to refer to the Department Undergraduate Handbook, the Undergraduate Catalog, the Ram’s Eye View, and the University website at [www.wcupa.edu](https://www.wcupa.edu/).

**STUDENTS WITH DISABILITIES**

If you have a disability that requires accommodations under the Americans with Disabilities Act (ADA), please present your letter of accommodations and meet with me as soon as possible so that I can support your success in an informed manner. Accommodations cannot be granted retroactively. If you would like to know more about West Chester University’s Services for Students with Disabilities (OSSD), please visit them at 223 Lawrence Center. Their phone number is 610-436-2564, their fax number is 610-436-2600, their email address is [ossd@wcupa.edu](mailto:ossd@wcupa.edu) , and their website is at <https://www.wcupa.edu/universityCollege/ossd/>. In an effort to assist students who either receive or may believe they are entitled to receive accommodations under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, the University has appointed a student advocate to be a contact for students who have questions regarding the provision of their accommodations or their right to accommodations. The advocate will assist any student who may have questions regarding these rights. The Director for Equity and Compliance/Title IX Coordinator has been designated in this role. Students who need assistance with their rights to accommodations should contact them at 610-436-2433.

**EXCUSED ABSENCES POLICY**

Students are advised to carefully read and comply with the excused absences policy, including absences for university-sanctioned events, contained in the WCU Undergraduate Catalog. In particular, please note that the “responsibility for meeting academic requirements rests with the student,” that this policy does not excuse students from completing required academic work, and that professors can require a “fair alternative” to attendance on those days that students must be absent from class in order to participate in a University-Sanctioned Event.

**REPORTING INCIDENTS OF SEXUAL VIOLENCE**

West Chester University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to comply with the requirements of Title IX of the Education Amendments of 1972 and the University’s commitment to offering supportive measures in accordance with the new regulations issued under Title IX, the University requires faculty members to report incidents of sexual violence shared by students to the University's Title IX Coordinator. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred to the person designated in the University Protection of Minors Policy. Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at: <https://www.wcupa.edu/_admin/diversityEquityInclusion/sexualMisconduct/default.aspx>

**INCLUSIVE LEARNING ENVIRONMENT AND ANTI-RACIST STATEMENT**

Diversity, equity, and inclusion are central to West Chester University’s mission as reflected in our [Mission Statement](https://www.wcupa.edu/president/missionStatement.aspx), [Values Statement](https://www.wcupa.edu/president/valuesAndVision.aspx), [Vision Statement](https://www.wcupa.edu/president/valuesAndVision.aspx) and [Strategic Plan: Pathways to Student Success](https://www.wcupa.edu/president/strategicPlan/default.aspx). We disavow racism and all actions that silence, threaten, or degrade historically marginalized groups in the U.S. We acknowledge that all members of this learning community may experience harm stemming from forms of oppression including but not limited to classism, ableism, heterosexism, sexism, Islamophobia, anti-Semitism, and xenophobia, and recognize that these forms of oppression are compounded by racism.

Our core commitment as an institution of higher education shapes our expectation for behavior within this learning community, which represents diverse individual beliefs, backgrounds, and experiences. Courteous and respectful behavior, interactions, and responses are expected from all members of the University. We must work together to make this a safe and productive learning environment for everyone. Part of this work is recognizing how race and other aspects of who we are shape our beliefs and our experiences as individuals. It is not enough to condemn acts of racism. For real, sustainable change, we must stand together as a diverse coalition against racism and oppression of any form, anywhere, at any time.

Resources for education and action are available through WCU’s [Office for Diversity, Equity, and Inclusion](https://www.wcupa.edu/_admin/diversityEquityInclusion/changeBeginsHere.aspx) (ODEI), DEI committees within departments or colleges, the student [ombudsperson](https://www.wcupa.edu/_services/STU/studentOmbuds/), and centers on campus committed to doing this work (e.g., [Dowdy Multicultural Center](https://www.wcupa.edu/_services/multicultural/), [Center for Women and Gender Equity](https://www.wcupa.edu/_services/Stu.wce/violenceprevention.aspx), and the [Center for Trans and Queer Advocacy](https://www.wcupa.edu/_services/transAndQueer/)).

Guidance on how to report incidents of discrimination and harassment is available at the [University’s Office of Diversity, Equity and Inclusion](https://www.wcupa.edu/_admin/diversityEquityInclusion/).

**EMERGENCY PREPAREDNESS**

All students are encouraged to sign up for the University’s free WCU ALERT service, which delivers official WCU emergency text messages directly to your cell phone. For more information, visit [www.wcupa.edu/wcualert](https://www.wcupa.edu/wcualert/). To report an emergency, call the Department of Public Safety at 610-436-3311.

**ELECTRONIC MAIL POLICY**

It is expected that faculty, staff, and students activate and maintain regular access to University provided e-mail accounts. Official university communications, including those from your instructor, will be sent through your university e-mail account. You are responsible for accessing that mail to be sure to obtain official University communications. Failure to access will not exempt individuals from the responsibilities associated with this course.

 Resources for Student Success

Expectations for Student Success in Distance Education

An online course uses technology to provide you, the student, with greater flexibility regarding when and where you learn. To be a successful online learner you must capitalize on this increased flexibility by doing the following.

Self-Motivation and Self-Discipline

Active participation in online activities is expected. This means that you login to the course frequently, engage with the provided materials, and read and respond to communications in a timely and thoughtful manner. Online courses require you to take *more* responsibility for your learning.

Planning and Organization

You will need disciplined work habits, effective time management skills, and the ability to work both alone and collaboratively if you wish to be successful in an online course. You should expect to devote 9 to 12 hours per week to this course. You may find that you need to work harder than you would in a traditional lecture class.

Communication Skills

In an online course communication takes place primarily through the written word. You need strong English reading and writing skills to express your thoughts. Online courses also expect you to proactively reach out to your instructor for assistance when you need it. Finally, pay attention to communication guidelines and be respectful of your fellow students when you communicate.

Minimum Student Technical Skills

You are expected to be competent in the use of computers, the World Wide Web, and commonly used software programs such as the Microsoft Office Suite of applications and Adobe PDF readers. In addition, you should be able to utilize a web-camera and microphone. You should have a basic understanding of how to use the common elements of the university learning management system.

Students without experience using the university’s learning management system (Desire2Learn) can contact the Student Help Desk to arrange instruction, can contact Distance Education Support, or can complete tutorials in [Navigating Digital Learning](https://d2l.wcupa.edu/d2l/home/2513024).

Hours for support services may vary. Check their websites for times of operation.

General Technical Support

Contact the [WCU IT Helpdesk](https://www.wcupa.edu/infoservices/helpSupport.aspx)    
call 610-436-3350  
email [helpdesk@wcupa.edu](mailto:helpdesk@wcupa.edu)

Distance Education Support

Contact [Office of Digital Learning & Innovation](https://www.wcupa.edu/distanceed/)   
call 610-436-3373  
email [distanceed@wcupa.edu](mailto:distanceed@wcupa.edu)

Additional technical support information will be provided for tools as needed throughout the course.

Accessibility Policies, Privacy Policies, and Support Site Information:

This course uses a variety of tools. To access a tool’s accessibility and privacy policy, navigate to the [Distance Education Accessibility and Privacy Policies website](https://www.wcupa.edu/DistanceEd/resourcesandpolicies.aspx).

Student Academic and Support Services

Student academic and support services provided by the university can be found on the [Ram’s Eye View Services website](https://www.wcupa.edu/_services/STU/ramsEyeView/services.aspx).

Library Resources for Distance Education Students

The West Chester University Library makes resources available to distance education students. Please review the [Library Services for Distance Students website](http://subjectguides.wcupa.edu/distance) for specific information.

**Tentative Schedule**

|  |  |  |
| --- | --- | --- |
| **MODULE** | **DATE** | **Topics** |
| 1 | *flexible* | Introduction / Class Overview  Introduction to SQL [CLO1] |
| 2 | *flexible* | SAS SQL [CLO1] |
| 3 | *flexible* | PROC SQL – Combining Data Vertically [CLO1] |
| 4 | *flexible* | PROC SQL -  Combining Data Horizontally [CLO1] |
| 5 | *flexible* | PROC SQL -  Creating and modifying Datasets Using SQL [CLO1] |
| 6 | *flexible* | PROC SQL -  In Line Views [CLO1] |
| 7 | *flexible* | Best Practices  Efficient SAS Programming  Controlling Memory Usage [CLO3] |
| 8 | January 12  6 PM | EXAM 1 |
| 8 | *flexible* | Introduction to SAS MACRO PROGRAMMIN portion of the CLASS  SAS Macro Variables[CLO2] |
| 9 | *flexible* | SAS Macro FUNCTIONS [CLO2] |
| 10 | *flexible* | Macro Programming Code – Structure & Invocation [CLO2] |
| 11 | *flexible* | Modifying SAS Datasets and Tracking Changes with Macro language [CLO3] |
| 12 | *flexible* | SAS Programming for Clinical Trials – In action SAS Macro coding for Data Cleaning, Data Reporting, and Data Finalization  [CLO3] |
| 13 | *flexible* | Macro/SQL execution  Storing Macro Programs  Discussion CDISC compliance – SDTM/ADAM with MACRO [CLO3] |
| 14 | January 20  6PM | EXAM 2 |