

# SAS Programming I: DATA Step and PROC Fundamentals Syllabus



**Course Number: BIOL-40190**

**Section ID: available at [UCSD Extension website course page](#)**

**Quarter: Any**

**Course Dates: available at [UCSD Extension website course page](#)**

## Instructor Information

Name: Justina Flavin

## Communication Policy

Please use the Inbox Tool in the Canvas LMS to communicate with me directly. Click the Inbox>Select our class>compose message using the Inbox tool in the Global navigation menu.

I will respond to messages within 48 hours unless otherwise stated.

I encourage you to communicate with me well in advance of an assignment/test due date/submission date if you are experiencing any difficulties understanding assignment directions/requirements or if you anticipate having difficulty completing assigned work prior to a deadline.

Please see the Canvas Orientation for Students (in your Canvas Dashboard) for UC San Diego Extension's expectations of appropriate communication etiquette in all exchanges between students and instructors in the digital space (messages and discussion board postings).

## Course Information

### Course Description (Goals and Objectives)

The SAS® system is a software suite for data analysis and management, widely used in business, government, and academia. Because the pharmaceutical, biotech, and clinical research industries use SAS to analyze clinical trial data, SAS programmers are in especially high demand in these industries.

In this course, students will learn the tools necessary to write SAS programs to perform elementary data management, analysis, and reporting. Students will also gain the skills necessary to create and document data sets, manage and reshape data, write simple reports, and compute basic statistics on data set variables.

Topics include:

- Creating, viewing, and inspecting SAS data sets
- Formats and labels
- Conditional processing
- Iterative processing
- Numeric functions and missing values
- Subsetting, interleaving, and merging data sets

Practical experience:

- Writing SAS programs to read in data, manipulate the data, and generate reports

### Course Materials and Textbooks

**Required Text:** Learning SAS by Example: A Programmer's Guide, 1<sup>st</sup> or 2<sup>nd</sup> Edition  
by Ron Cody

The textbook provides a comprehensive introduction to the SAS programming language and is recommended by SAS for use in preparing for the Base SAS Certification Exam.

Students interested in purchasing a second book should consider any edition of The Little SAS Book: A Primer by Lora Delwiche and Susan Slaughter.

**Software:** Students must download and install SAS® OnDemand for Academics: Enterprise Guide. There is no additional cost for this product and it provides access to SAS software through the Internet. Registration and download information will be provided by the instructor after enrollment in the course.

## **Information about SAS Certification**

Taking [SAS certification exams](#) help you validate your skills and increase your value to an employer. You can choose SAS certifications across many subjects, including programming, data management, and analytics, to name a few.

All students, teachers, professors or staff associated with an academic institution qualify for a 50% discount on all SAS certification exams. Please contact [certification@sas.com](mailto:certification@sas.com) to receive the discount code that will reduce the exam fee by 50% during the registration process.

## **Resources for Learning SAS**

### SAS Certification Prep Guides

Visit [SAS Communities](#) to share and connect with other SAS users and build your SAS skills. Don't miss key communities including: SAS Certification, SAS Training, SAS Academy for Data Science, SAS Programming, New SAS User, SAS Analytics U and SAS Viya for Learners.

### Course Prerequisites

Completion of [Introduction to Programming](#) or basic programming skills required.

### Student Learning Outcomes

By the end of this course students will be able to:

- Navigate the SAS Enterprise Guide programming environment
- Read various types of data files into SAS data sets
- Manipulate and manage data sets by combining and subsetting, creating new variables
- Use numeric and character functions, perform conditional and iterative processing, apply formats and labels
- Create and enhance detail and summary reports using basic SAS procedures (PROCs FREQ, MEANS, PRINT, REPORT)

## Course Schedule

All lectures are available throughout the course. Students are free to progress through the lectures at their own pace. Topics and major assignments are shown below.

### Weeks 1-3

Introduction to SAS® (Chapters 1 & 2)  
Getting Started with the DATA STEP (Chapter 3)  
Creating, Viewing, and Inspecting SAS Data Sets (Chapter 4)  
Formats and Labels (Chapter 5)  
Conditional Processing (Chapter 7)  
Iterative Processing (Chapter 8)  
Dates in SAS (Chapter 9)

### Week 4 - Programming Assignment 1 Due

### Weeks 5-6

Numeric Functions and Missing Values (Chapter 11)  
Subsetting, Interleaving, and Merging Data Sets (Chapter 10)  
Character Functions (Chapter 12)  
PROC PRINT (Chapter 14)  
PROC MEANS (Chapter 16)  
PROC FREQ (Chapter 17) and PROC UNIVARIATE

### Week 7 - Programming Assignment 2 Due

Week 8 - PROC REPORT (Chapter 15)

### Week 9 - Programming Assignment 3 Due

## Complete Assignment Schedule

Week	Assignment	Points
1	Install SAS Software	0
2	Discussion Board – Student Introduction	1
3	Discussion Board Topic 1	3
4	Programming Assignment 1	35
5	Discussion Board Topic 2	3
6	Discussion Board Topic 3	3
7	Programming Assignment 2	35
8	None	
9	Programming Assignment 3	20
	<b>TOTAL POINTS</b>	<b>100</b>

## Grading and Assignment Information

Letter grades are based on the UC San Diego Extension Grading Scale. Your final course grade is based on the percentage of points you have earned.

Passing Grades	
A+	100%
A	93-99%
A-	90-92%
B+	87-89%
B	83-86%
B-	80-82%
C+	77-79%
C	73-76%
C-	70-72%

Non-Passing Grades	
D	60-69%
F	59% and below

### Weighted Grading Criteria

Discussion Board Assignments	10%
Programming Assignments	90%
<b>TOTAL</b>	<b>100%</b>

You can check your grade in Canvas at any time by clicking **Grades** in the course navigation menu.

### Grading Policies

This course can be taken as part of the Biostatistics certificate and SAS Programming certificate. For the class to count towards your certificate, it must be taken for a letter grade or as pass/no pass. Classes that are taken as NFC cannot count towards a certificate. You can change your grading option any time **BEFORE** the last day of class through My Extension.

Assignment grades will be posted in the Gradebook within 7-10 days after the assignment due date. Final Course Grades will be posted within 10 working days after the course end date.

### Late Policy

Except in extenuating circumstances, late assignments will not be accepted. Extenuating circumstances include natural disasters, your serious health issues, or other problems beyond your control. Extenuating circumstances do not include work deadlines, travel/vacation, or the Canvas system or the SAS server being

down/unavailable for a few hours. Additionally, I will only accept a late assignment if all previous assignments have been completed and submitted. If you believe that your situation merits consideration, then you must contact me with details via email before the assignment is due.

## Assignments

Graded coursework consists of two types of assignments, a Discussion Board Topic or a Programming Assignment. An assignment is due each week per the assignment schedule shown in the Course Schedule section.

The majority of the course grade is based upon writing a comprehensive SAS program to read in data, manipulate the data, and generate reports. The program will be completed in 3 parts (Programming Assignments 1,2,3), and each subsequent part will build upon the previous part.

It is acceptable to collaborate and work on the programming assignments with other students. Students are also encouraged to post questions and discuss the assignment problems in the appropriate discussions thread(s) in Canvas.

Your grade on the programming assignments will be based not upon "getting the right answer" but upon how successful you are at writing solutions that conform to the programming specifications provided for each item.

## Assignment Quality

I WILL NOT grade or provide comments on incomplete programming assignments and/or those that are not of a passing grade/quality, nor will I provide my solution code to students who submit such assignments. A passing grade on Programming Assignments 1 & 2 is a score of at least 25 points on each assignment. A passing grade on Programming Assignment 3 is a score of at least 14 points.

## Discussion Board

The Discussion Board Assignments were developed from discussions that have taken place in traditional (classroom) classes. The goal of these discussions is to encourage interaction with classmates and enable students to think about concepts, good programming practices, and programming issues that might be encountered while working as a SAS programmer - and then to be able to apply these ideas to the programming assignments.

The attributes of effective participation are as follows:

- Taking a leadership role by being the first to post a topically meaningful response to an assignment.
- Responding thoughtfully to the postings of your classmates, including rebuttal of ideas/opinions
- Expanding on the assignment by posing thought-provoking questions and/or providing topically relevant/related outside links
- Posting in a timely manner

When I grade your Discussion Board work, I am most interested the quality of your postings/responses. Your contributions should add to the knowledge base of all of the participants in this class and provide substantive thought to receive points. If you are less knowledgeable about a topic, pose questions about the topic and/or share what you find in researching the topic yourself.

Please note that you are expected to comply with UC San Diego Extension's Academic Integrity Standards and netiquette expectations in your postings. If you are unfamiliar, please see the Canvas Orientation for students and the UC San Diego Extension website. If your instructor suspects an academic integrity violation such as failure to cite sources, copying and pasting from any source without using quotation marks and proper citation, unsuccessful paraphrasing resulting in plagiarism, your grade will remain 0 until the matter is resolved.