



University of Wisconsin-Stevens Point

College of Letters and Science
Department of Computing and New Media Technologies

Stevens Point, WI 54481-3897
(715) 346-4409; Fax (715) 346-4260

DAC 111 – Introduction to Programming for Data Analytics (3 credits)

M W 8:00 – 9:15 p.m.

Location: SCI D224

Instructor:	Tim Krause, PhD	Office:	B231, Science Building
Web:	http://www.timkrause.info	Phone:	715-346-3851
Office Hours:	10:00 – 11:00 a.m. Monday 3:00 – 4:00 p.m. Thursday By Appointment (jwierzba@uwsp.edu)	Email:	tkrause@uwsp.edu

Course Description

Introduction to a data analytics programming language; practical issues in statistical programming, including programming, reading data, accessing packages, writing functions, debugging, profiling and organizing and commenting code; topics in statistical data analysis will provide working examples.

This course is the second in a five course sequence:

DAC 101	Introduction to Data Analytics
DAC 111	Programming for Data Analytics
CIS 110	Introduction to Object-Oriented Programming
CIS 120	Data Structures and Algorithms
DAC 205	Principles of Data

To be successful in this course requires a basic understanding of at least one other programming language, like R or Java. While the pre-requisite course is technically DAC 101, CIS 110 or concurrent enrollment in either course is also considered acceptable.

Objectives

- Develop the ability to critically identify, select and use programming languages to solve problems using data sets
- Model, modify, update and query data using a variety of schema (e.g. XML, MySQL, text)
- Continue developing the ability to trouble-shoot and debug code written by oneself and others
- Continue developing the skill of presenting technical solutions, orally and in writing

Required Text and Material Purchase

McKinney, Wes. *Python for Data Analysis*. O'Reilly. 2013. ISBN: 978-1-449-31979-3
(Estimated purchase price: \$39.99)

Optional Text

Brownley, Clinton W. *Foundations for Analytics with Python*. O'Reilly. 2016. ISBN: 978-1-491-925553-8
(Estimated purchase prices: \$44.99)

You are also required to have some method for saving and bringing assignments to class (e.g. Flash Drive, Dropbox, Google Drive).



Assignments

Assignments will be announced in class and posted on D2L. If you miss class, it is your responsibility to check D2L for any homework assignments and supporting material which may have been given out during class.

All assignments will be turned into D2L. For each assignment, you will write a 1-2 paragraph retrospective, save it as a separate **Word** document and also turn it into D2L. Your retrospective should: describe what worked well, what didn't work so well, and what you plan to do differently next time. Turn in any peer review sheets during class on the due date. Missing or incomplete design rationales or peer reviews can **each** result in losing $\frac{1}{2}$ letter grade on your final grade.

In-class assignments may not be made up, or turned in after the end of class.

I recommend that you start working on assignments as soon as possible after they have been announced. These projects almost always take longer than originally anticipated; starting early greatly increases your odds of completing the project to your satisfaction. Please call, email or see the instructor as soon as possible, and **before the due date**, with any questions or concerns about an assignment.

Assignments

Miscellaneous Exercises	150	Midterm Project	100
Quizzes (Approx. 5)	100	Final Project	200
Midterm Exam	150	Attendance and Participation	100
Final Exam	200		
		Total	1,000

* Miscellaneous points will be rewarded based on smaller take-home and in-class exercises.

Final Exam: Thursday, May 18th, 10:00-12:15, SCI D224

Due Dates & Late Assignments

Unless otherwise noted by the instructor, assignments are due no later than the **beginning of class** on the due date. Grades for late assignments will be reduced by one letter grade per weekday. Assignments may only be made up if the absence was due to documented illness, approved university activity or family emergency.

If you miss class or an assignment due to an approved university activity, illness or family emergency on the day an assignment is due, it is your responsibility to contact the instructor **before the start of class that day** in order to make alternative arrangements.

Attendance

This class assumes perfect attendance. In the event you need to miss a class, please consult with classmates regarding material you may have missed.



Grading Scale

Final grades will be determined according to the following scale:

B+	92 – 91%	A	100 – 95%	A-	94 – 93%
C+	82 – 81%	B	90 – 85%	B-	84 – 83%
D+	72 – 71%	C	80 – 75%	C-	74 – 73%
		D	70 – 65%	F	< 64%

I reserve the right to lower the grading scale (e.g. it may require less than 95% to earn an A).

Academic Standards

The University of Wisconsin – Stevens Point is an academic community of individuals committed to the pursuit of learning, the acquisition of knowledge, and the education of all who seek it. This course expects that all work turned in for a grade is your own, or that of your group. A description of your rights and responsibilities as a member of the UWSP community can be found at:

<http://www.uwsp.edu/admin/stuaffairs/rightsandresponsibilities.aspx>

Student Academic Standards and Disciplinary Procedures (UWS/UWSP Chapter 14) is available at: <http://www.uwsp.edu/admin/stuaffairs/rights/rightsChap14.pdf>

Cell Phone, IM and Recording Devices

Please turn off cell phones before entering the classroom. Cell phones may not be used in the classroom without prior permission of the instructor. Instant messaging, including *Facebook and social media sites*, should also be turned off, unless you are communicating with a group member working remotely. If you would like to record (video or audio) any aspect of this course, please seek prior permission from the instructor.



Tentative Topic List and Course Schedule

Date	Topic	Reading	Due
Jan. 23	Course Introduction, Installing Python	Chapter 1	
Jan. 25	Why Python? Introduction to Python	Chapter 1, Chapter 2	
Jan. 30	Data Manipulation, Analyzing Trends	Chapter 2	
Feb. 1	IPython and Basic Troubleshooting	Chapter 3	Quiz 1
Feb. 6	IPython and Basic Troubleshooting	Chapter 3	
Feb. 8	Arrays, Scalars and Data Structures	Chapter 4	
Feb. 13	Arrays, Scalars and Data Structures	Chapter 4	
Feb. 15	Lab Day		Quiz 2
Feb. 20	pandas Library and Data Structures	Chapter 5	
Feb. 22	pandas Library and Essential Functionality	Chapter 5	
Feb. 27	Data (Loading, Storage and File Formats)	Chapter 6	
Mar. 1	Data: Working with CSV	Assigned	Quiz 3
Mar. 6	Lab Day		
Mar. 8	Data: Working with XLS	Assigned	
Mar. 13	Data: Working with MySQL	Assigned	Midterm Project
Mar. 15	Midterm Exam		
Mar. 20	Spring Break		
Mar. 22	Spring Break		
Mar. 27	Data: Working with MySQL	Assigned	
Mar. 29	Data: Working with MySQL	Assigned	
Apr. 3	Data: Working with MySQL	Assigned	
Apr. 5	Data: Working with XML	Assigned	Quiz 4
Apr. 10	Cleaning and Transforming Data	Chapter 7	
Apr. 12	Cleaning and Transforming Data	Chapter 7	
Apr. 17	Data Visualization	Chapter 8	
Apr. 19	Data Visualization	Chapter 8	Quiz 5
Apr. 24	Data Aggregation	Chapter 9	
Apr. 26	Data Transformation	Chapter 9	
May 1	Time and Periodic Analysis	Chapter 10	
May 3	Time and Periodic Analysis	Chapter 10	
May 8	Financial Applications	Chapter 11	
May 10	Financial Applications	Chapter 11	
May 12	Lab Day		Final Project
May 18	Final Exam		

