# Introduction to Computing and Programming

CNMT 101  Section 01

Spring 2024

## Course Information

**Course Meeting Times:** MWF 9:00 – 9:50 pm A224 SCI

**Course Description:** Explore the foundations of modern computing to include algorithms, programming, and the use of technology to solve problems. This course introduces key principles of procedural programming and program design using a modern programming language. The course also offers an overview of computing as a discipline and its social impacts.

This section was created for students who have majors within the School of Mathematics, Computing, Physics and Astronomy and the School of Biology, Biochemistry, and Chemistry. This section will focus more on computational thinking, and specifically programming with Python compared to the other sections of the course.
**Credits:** 3
**Prerequisite:** none
**GEP:** none

## Textbook & Course Materials

**Required Text:** Pick up at Text Rental Understanding Computers in a Changing Society, 5th Edition, CENGAGE 9781133191032
**Handouts:** Distributed during class and posted on Canvas

## Course Learning Objectives

- **Design a computer program that solves a computational problem.**
  - Sequence and combine variables, operators, conditional structures, and loops to create an intended result.
  - Develop simple algorithms using arithmetic-based, string and/or array operations.
- **Write program code to implement a computer program.**
  - Use primitive data types (strings, numeric, Boolean).
  - Define, initialize, and use variables.
  - Use arithmetic, assignment, comparison, and logical operators.
  - Use conditional statements and loops.
  - Implement nesting loops.

    - Use one-dimensional arrays and implement array traversal.
    - Declare and invoke functions with and without parameters.
    - Import and use modules.
- **Test and troubleshoot computer programs and correct errors.**
    - Describe common errors in program code: syntax errors, logic errors, runtime errors.
    - Use debugging tools to step through code to examine program state and behavior.
    - Interpret compiler and runtime error messages and correct the root cause.
- **Explain how computer programs and algorithms work.**
    - Document program code to describe its functioning.
    - Explain basic units of information used in programming (bit vs. byte) and how they are represented in computer memory (e.g., char → stored as an ASCII value → uses binary representation).
    - Explain difference between an interpreted program and compiled program.
- **Describe ethical and social issues related to computing.**
    - Describe ethical issues related to large scale data collection.
    - Identify common applications of computer algorithms.
    - Explain significance of computing as the driver of modern enterprise and public services.
- **Describe concepts around networking and Internet protocols.**
    - Describe the function of major protocols such as IP, ICMP, DNS, DHCP, HTTP, HTTPS.
    - Describe differences between LAN and WAN, wired, wifi, and cellular networks.
    - Describe the classes of IP networks, with focus on private vs. public spaces.
    - Describe the difference between a firewall, router, and switch.
- **Explain how networks work.**
    - Explain the relationship between a web browser and a web server.
- **Describe concepts around computer and data security.**
    - Describe security issues related to confidentiality, integrity, and availability.
    - Describe authentication and authorization, with a focus on storage, multi-factor authentication, biometrics, and related.
    - Describe the ways in which attacks occur, from physical/natural disaster to targeted phishing.
- **Test and troubleshoot computer networking issues.**
    - Use command line tools to perform basic troubleshooting.
    - ping, traceroute, whois, dig/host/nslookup, netstat/ss

# Instructor Information

Brad Hinaus
Office: B107 Science
Phone: 715-254-5141 (cell)
Zoom Address:
Email: bhinaus@uwsp.edu

**Student Hours**

You can stop by my office at the times listed above or make an appointment. I warn you that I wander during sudent hours. Feel free to send me a text if I am not there. If you know you are coming, let me know. If you would like to meet via Zoom, send me a text and we can meet at our class Zoom Address for our meeting.

**Instructor Student Hours; B107 SCI**

M 10-11
T 10-11
W 10-11
Th 10-11
F 10-11

By Zoom during above hours or by appointment

1. Send me a text on cell phone @7152545141
2. Click link for meeting. https://wisconsin-edu.zoom.us/j/8496836849

**My Teaching Philosophy**

I think the college classroom should reflect basketball practice or music lessons. Mentally picture what basketball practice looks like or what individual music lessons look like. What do you see? Its active, people (the learners) are moving around and doing things. Players or instrumentalists don't spend 100% of their time watching their coach or teacher draw diagrams on a whiteboard and talk continuously. They spend a good portion of their time working on the skills with each. That is what I want us to do, work on our coding skills during class *with each other*. Will we eliminate the lecture? No, but I hope to reduce the amount of time in that mode so we can practice and ask questions. Most often, we will introduce a topic a lecture, then spend the next 1 or 2 lectures using it in coding.

Here is my philosophy on answering questions you have while working on code. It is similar to the statement, "Give a person a fish, feed them for a day, teach them how to fish and feed them for a life." When a person asks, "Why doesn't my code work?", I will try to ask the person a question about their code so **they can reason** why it doesn't work. This will teach them to be a better thinker, understand their own thinking, and understand the coding process better.  Is it efficient?  Not in the time scale of class.  It is quicker to tell you the answer.  But it is more efficient in the time scale of completing a major.  One of the best skills you can learn as a programmer is to determine why your code does not work.  It usually comes down to one of a few things: a.) correct syntax  b.) logical reasoning  or c.) an untrue assumption.  Sometimes the best way out of jam it to generously use the "print" statement at numerous lines in the code to see if the output from the code matches what you expect it to be.

**Inclusivity Statement**

It is my intention that students from all backgrounds are well served in this course.   Backgrounds can include gender, race, orientation, age, disability, religion, culture, and other ways a person identifies.  Other backgrounds that give students various perspectives of this course are their current mathematical abilities, their developing problem-solving abilities, past courses, life experiences growing up, classroom environments they have experienced, preferred learning style and more.  In this course, it is expected that each other's thoughts and comments be respectfully listened to and/or responded to during class, lab, and discussion.  There are numerous ways to have a computer solve a problem.  It is also expected during the course time, that students work to assist each other in the learning process.

To help you with the difficulties of this class, I am available in scheduled office hours and meeting by appointment.  In past semesters I have had standing 1-hour meetings with individual students each week.  I am welcome to those if you would like to schedule on with me.  If you would like to hear a different perspective, the STEM Drop-in tutoring is available in CBB 190 (see below).   If you have suggestions for me on how to make this class more inclusive between instructor/student and student/student interactions or activities, please let me know.

## STEM Drop-In Tutoring Center Schedule

Tutors for STEM courses are available on a drop-in basis - no appointment needed! The STEM Drop-In Tutoring Center is in CBB 190, right next to Starbucks. Click on the subject below to expand the section to view tutoring days and times.  Tutors are students who have done well,  A- or better in classes, so they are knowledgeable about the subject.   Drop-in Tutoring is FREE!   The schedule will be posted at the following link shortly after the semester begins. https://www3.uwsp.edu/tlc/Pages/dropInTutoring.aspx
Three pieces of advice:

1. Find a tutor whose thinking meshes with your own.
2. Be sure the tutor is helping you think about i how to solve the problem you are having.  The tutor should not "just give you the answer".   For new tutors, sometimes they are excited to solve a problem and just solve it.  (When I was in graduate school, I was that kind of tutor until someone pointed it out).  If you do not understand what the tutor did/explained to you, you have permission ask them to

explain it again, or ask them to dream up another question where you need to use the same type of thinking so you can practice it on your own.

3. Your goals for going to the tutor is to understand the material that the assignment is making you practice NOT to finish the assignment without understanding.

# Grading Policies

## Graded Course Activities

### Homework and Projects – 60%

You will have regular homework assignments and projects during this course. These activities are designed to help you practice, learn, and apply the course content. You can expect weekly homework in this course. You will also have several larger projects in which you will design and code the program to solve the problem.

### Exams – 40%

There will be two exams in this course. Exams will be given in class . You will be allowed to bring in cheat sheet. Details will be given before the exam. Exams will be designed to test your knowledge and understanding of core course concepts. You will only receive one attempt on exams

.

## Late Work Policy

Be sure to pay close attention to deadlines—you will be able to turn in an assignment late up until the time the instructor grades it.

Any assignment that is turned in after the instructor has been graded will receive a reduction of up to 30% of the score at the discretion of the instructor. If students are having difficulties completing the assignments due to factors outside of class (health, family, work, other classes, etc.), they should communicate this to the instructor (email) before the due date to avoid the full deduction in points. All assignments for the semester must be received by 11:59 pm the last day of the semester (not finals week). If the difficulties are because of class material, it is suggested that the **student advocate for themselves** and make an appointment with the instructor for further assistance.

**Exams must be taken during the scheduled day in class.**

## Letter Grade Assignment

| Letter Grade | Percentage |
|---|---|
| A | 93-100% |

| | |
|---|---|
| A- | 90-92.99% |
| B+ | 87-89.99% |
| B | 83-86.99% |
| B- | 80-82.99% |
| C+ | 77-79.99% |
| C | 73-76.99% |
| C- | 70-72.99% |
| D+ | 67-69.99% |
| D | 60-66.99% |
| F | 0-59.99% |

# Technology

## Course Technology Requirements

- View this website to see minimum recommended computer and internet configurations for Canvas.
- If you will be using your personal computer, you will need to install the Python programming language on it. In this class, we will use the Anaconda Navigator to install an editor and the Python 3 programing language. Students are free to install a different editor and suite if they like.

## UWSP Technology Support

- Visit with a Student Technology Tutor
- Seek assistance from the IT Service Desk (Formerly HELP Desk)
    - IT Service Desk Phone: 715-346-4357 (HELP)
    - IT Service Desk Email: techhelp@uwsp.edu

# University Course Policies

## Understand When You May Drop or Withdraw from This Course

It is the student’s responsibility to understand when they need to consider unenrolling from a course.

- Dropping the Course: You may drop the course on or **before Jan 31, 2024, with no grade on your official university transcript.** The date of the drop will appear. This is called a “clear drop

- Withdrawing from the Course: You may withdraw from this class on or **before April 5, 2024** . You will receive a grade of “W” on your transcript. After the first two semesters of enrollment at UWSP, students are allowed a total of only four (4) ”W “drops during the balance of their undergraduate career, including summer sessions.
- These are posted on the UWSP Academic Calendar. After this period, a serious and compelling reason is required to drop from the course.
- Serious and compelling reasons includes: (1) documented and significant change in work hours, leaving student unable to attend class, or (2) documented and severe physical/mental illness/injury to the student or student’s family.
- More Info from this University Link

## Incomplete Policy

Under emergency/special circumstances, students may petition for an incomplete grade. Link - University Policy on Incompletes

## Inform Your Instructor of Any Accommodations Needed

If you have a documented disability and verification from the Disability Resource Center (DRC) and wish to discuss academic accommodations, please contact your instructor as soon as possible. It is the student’s responsibility to provide documentation of disability to the DRC and meet with their counselor to request special accommodation *before* classes start. Three Steps to Apply for Accommodations.

The Disability and Assistive Technology Center is located in 108 Collins Classroom Center and can be contacted by phone at 715-346-3365 (Voice) (715) 346-3362 (TDD only) or via email at datctr@uwsp.edu

**Statement of Policy**
UW-Stevens Point will modify academic program requirements as necessary to ensure that they do not discriminate against qualified applicants or students with disabilities. The modifications should not affect the substance of educational programs or compromise academic standards; nor should they intrude upon academic freedom. Examinations or other procedures used for evaluating students' academic achievements may be adapted. The results of such evaluation must demonstrate the student's achievement in the academic activity, rather than describe his/her disability.

*If modifications are required due to a disability, please inform the instructor and contact the Disability and Assistive Technology Center in 609 ALB, or (715) 346-3365.*

## UWSP Academic Honesty Policy & Procedures

### Student Academic Disciplinary Procedures

UWSP 14.01 Statement of principles

The board of regents, administrators, faculty, academic staff and students of the university of Wisconsin system believe that academic honesty and integrity are fundamental to the mission of higher education and of the university of Wisconsin system. The university has a responsibility to promote academic honesty and integrity and to develop procedures to deal effectively with instances of academic dishonesty. Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for respect of others' academic endeavors. Students who violate these standards must be confronted and must accept the consequences of their actions.

UWSP 14.03 Academic misconduct subject to disciplinary action.

(1) Academic misconduct is an act in which a student:

(a) **Seeks to claim credit for the work or efforts of another without authorization or citation**;

(b) Uses unauthorized materials or fabricated data in any academic exercise;

(c) Forges or falsifies academic documents or records;

(d) Intentionally impedes or damages the academic work of others;

(e) Engages in conduct aimed at making false representation of a student's academic performance; or

(f) Assists other students in any of these acts.

(2) Examples of academic misconduct include, but are not limited to: cheating on an examination; collaborating with others in work to be presented, contrary to the stated rules of the course; **submitting a paper (i.e. code) or assignment as one's own work when a part or all of the paper or assignment is the work of another**; submitting a paper or assignment that contains ideas or research of others without appropriately identifying the sources of those ideas; stealing examinations or course materials; submitting, if contrary to the rules of a course, work previously presented in another course; tampering with the laboratory experiment or computer program of another student; knowingly and intentionally assisting another student in any of the above, including assistance in an arrangement whereby any work, classroom performance, examination or other activity is submitted or performed by a person other than the student under whose name the work is submitted or performed.

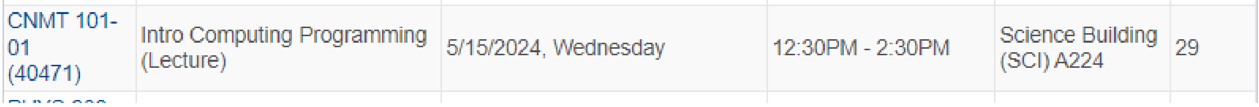
## Religious Beliefs

Relief from any academic requirement due to religious beliefs will be accommodated according to UWS 22.03, with notification within the first three weeks of class.

# Schedule

| Week | Monday | Wednesday | Friday |
|---|---|---|---|
| 1 | Syllabus | Monte Hall Problem | Variables, Print, Input |
| 2 | Variables, Print, Input | How a Computer Stores Data<br>-Install Python w/Anaconda<br>Running a Program | Lab Exercise- Hello World, Strings, Simple Math |
| 3 | Strings | Lab- A “Listed” Phone Number | Lists |
| 4 | Lab: Love It or List It | While Loops | While Loops |
| 5 | Lab- Averages with Loops | Debugger and Errors Syntax, Logic, Runtime<br>Compiled vs. Interpreted | Lab- Calculate PI |
| 6 | Lab- Calculate PI | Modules – Random, Math | Module – Matplotlib |
| 7 | Lab- Graphing with Matplotlib | Networking Concepts | Networking Concepts |
| 8 | Networking Concepts | IF statements | Test #1 |
|  | Spring Break | Spring Break | Spring Break |
| 9 | Lab: Monte Hall – A Game of IF’s | Lab: Monte Hall – A Game of IF’s | Computer and Data Security |
| 10 | Computer and Data Security | FOR Loops General | For Loops, Lists, Items, and Indices |
| 11 | Lab – A Roll of the Dice | User Defined Functions | Lab- A Winning Ticket - Powerball |
| 12 | File Input and Output | Lab – Benford’s Law (Using File Input/Output) | Cushion |
| 13 | Lab- Top Spin - Game with Lame Name | Lab – Top Spin - Game with Lame Name | Memory Diagrams For Functions - Revisited |
| 14 | Monte Carlo Methods | Lab- Shall We Play a Game- Chutes and Ladders | Lab- Shall We Play a Game – Chutes and Ladders |
| 15 | Final Project | Final Project | Final Project (last day of class) |

Test #2 During Final Exam Period.



|  |  |  |  |  |  |
|---|---|---|---|---|---|
| CNMT 101-01 (40471) | Intro Computing Programming (Lecture) | 5/15/2024, Wednesday | 12:30PM - 2:30PM | Science Building (SCI) A224 | 29 |