**Course Description**

This course will introduce students to common topics in bioinformatics as well as corresponding computational approaches in those areas.

Students will learn how to implement and apply various algorithms and statistical models to solve challenging problems and will also build a foundation for developing tools for future technologies.

**Desired Prerequisites**

* Bioinformatics 545
* Upper level or graduate level Statistics or concurrent enrollment in Statistics
* Calculus I & II
* Biochemistry, Molecular Biology, or Cellular Biology
* Programming
* (*or permission of instructor*)

**Course Materials**

This course requires no textbooks; however, each student is to have *reasonable access* to a computer. If the student can install software onto the computers they have access to, we suggest the following:

**MacOS Users:**

* Homebrew Package Manager (<https://brew.sh/>)
* XQuartz X Server for MacOS (<https://www.xquartz.org/>)

**Windows 10 Users:**

As of version 1709, all Windows 10 users can have a full Linux build to work from. This means that this is the perfect opportunity to set it up. Because of this capability, we are *strongly recommending* all Windows 10 students to enable the Windows Subsystem for Linux (WSL) for this class.

* WSL Guide (<https://www.betteridiot.tech/blog/pop/betterblog/2018/9/windows-10-linux-subsystem-for-python-developers>)
* VcXsrv X Server for Windows (https://sourceforge.net/projects/vcxsrv/)

**Other Windows Version Users:**

* Free version of MobaXterm (<https://mobaxterm.mobatek.net/download.html>)
* Follow this guide (<https://www.betteridiot.tech/blog/pop/betterblog/2018/9/python-on-mobaxterm>)

**All Students:** (*Note:* Select your operating system before downloading where appropriate)

1. Follow this guide (<https://umich.instructure.com/courses/286817/pages/setting-up-python-dot-dot-dot-the-right-way>)
2. Pick **one** of the following:

* Miniconda build of Python 3.7 (<https://conda.io/miniconda.html>)
* Anaconda build of Python 3.7 (<https://www.anaconda.com/download/>)

1. Updated internet browser (Google Chrome or Mozilla Firefox are recommended)

**Grading Policy**

|  |  |
| --- | --- |
| Component | % of Grade |
| Participation | 25% |
| Quizes | 25% |
| Homework | 50% |

*Participation:* Attendance is not participation. This grade will be determined by your contribution to the Poll Everywhere surveys as well as through in-class code review sessions.

*Quizes:* The quizzes will consist of watching a series of scripted lectures **prior** **to class**. Embedded within the lectures are automated quiz questions. Your performance on these quizzes makes up your Quiz grade.

*Homework:* There will be 5 programming assignments throughout the course. Each is worth 10% of your total grade.

**Late/ Missing Assignment Policy**

Students who turn in an assignment late without a valid travel (in advance) or medical excuse will receive a 25% penalty on the assignment per day up to three days, after which the late assignment will receive 0 points. This is automated through Canvas, and not under the discretion of the instructors.

**Requiring Documentation for Missing Assignments**

If the student’s absence due to illness causes the student to miss an assignment, an exam, or any other required work for the class affecting the course grade, the professor has the right to require additional documentation verifying the cause of absence. The options available to make up that missed work may be limited and will be determined by the instructor within the limits of the course.

**Attendance Policy and Participation**

Attendance and participation are an important part of this class, and we strongly encourage questions and discussion. If you know in advance that you will miss a class session, please inform us ahead of time and we will work with you to accommodate this.

Both *attendance* and *participation* will be graded using Poll Everywhere (<https://www.polleverywhere.com/>). You are required to have an account with Poll Everywhere that is associated with your University of Michigan email.

**Academic Misconduct**

Students are held to the expectations outlined in the *Rackham Academic and Professional Integrity Policy* (https://rackham.umich.edu/policy/section8/) when seeking any accommodation due to absence. All of Rackham’s policy may be found at https://rackham.umich.edu/academic-policies/.

**Accommodations for Students with Disabilities**

If you think you need an accommodation for a disability, please let me know at your earliest convenience. Some aspects of this course, the assignments, the in-class activities, and the way the course is usually taught may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the Services for Students with Disabilities (SSD) office to help us determine appropriate academic accommodations. SSD (734-763-3000; [http://ssd.umich.edu](http://ssd.umich.edu/)) typically recommends accommodations through a Verified Individualized Services and Accommodations (VISA) form. Any information you provide is private and confidential and will be treated as such.

**Student Sexual Misconduct Policy**

Title IX prohibits discrimination based on sex, which includes sexual misconduct — including harassment, domestic and dating violence, sexual assault, and stalking. We understand that sexual violence can undermine students’ academic success and we encourage anyone dealing with sexual misconduct to talk to someone about their experience, so they can get the support they need. Confidential support and academic advocacy can be found with the Sexual Assault Prevention and Awareness Center (SAPAC) on their 24-hour crisis line, (734) 936-3333 and at sapac.umich.edu. Alleged violations can be non-confidentially reported to the Office for Institutional Equity (OIE) at [institutional.equity@umich.edu](mailto:institutional.equity@umich.edu). You may find alternate syllabus statements and more information at sapac.umich.edu/article/faculty-resources-sample-syllabus-language

**Student Mental Health and Wellbeing**

University of Michigan is committed to advancing the mental health and wellbeing of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, contact Counseling and Psychological Services (CAPS) at (734) 764-8312 and caps.umich.edu during and after hours, on weekends and holidays, or through its counselors physically located in schools on both North and Central Campus. You may also consult University Health Service (UHS) at (734) 764-8320 and <https://www.uhs.umich.edu/mentalhealthsvcs>, or for alcohol or drug concerns, see www.uhs.umich.edu/aodresources. For a listing of other mental health resources available on and off campus, visit: <http://umich.edu/~mhealth/>

**Religious-Academic Conflicts**

While the University does not observe religious holidays, it is the policy of the University of Michigan to make every reasonable effort to allow members of the University community to observe their religious holidays without academic penalty. Absence from classes or examinations for religious reasons does not relieve students from responsibility for any part of the course work required during the period of absence. Students who expect to miss classes as a consequence of their religious observance shall be provided with a reasonable alternative opportunity to make-up missed academic work. It is the obligation of students to provide faculty with reasonable notice of the dates on which they will be absent. When the absence coincides with an exam or other assignment due date, the options to make up that missed work may be limited and will be determined by the instructor within the boundaries of the respective class. Please see the policy as stated on the Office of the Provost website at: [www.provost.umich.edu/calendar](http://www.provost.umich.edu/calendar).