**Spring 2016 Syllabus**
**Course Code: BI 104-02**

**I. Instructor Information**
Mark Speck, PhD
Postdoctoral Fellow/Adjunct Faculty
Henry Hall Lab 9
2PM–5PM
mark.speck@chaminade.edu

**II. Course Information**
Th 9:00AM–9:50AM
Hale Hoaloha 102

III. **Required Text**
No text required

**IV. Course Title: BI 104 Digital Biology**

**V. Course Description:** This course is intended to be an examination on the role of technology and computational tools available to modern life scientists. Students will be exposed to a breadth of applications used in the information age to answer important biological questions across multiple disciplines. Computers enable scientists to improve data quality and laboratory efficiency more effectively than just a decade ago. Computational tools help researchers probe and model complex biological phenomena and more quickly react and adjust to changes in their fields of science. It's a quickening of discovery, which can increase breakthroughs, and health benefits from research by transdisciplinary teams. Although the Digital Biology course is a survey of the current state of digital science and how information technologies have impacted biology it is now considered an emerging discipline. In general, digital biology can be grouped into three areas as recently defined at the symposium, *Digital Biology: the Emerging Paradigm,* held at the National Institutes of Health in Bethesda Maryland, "1) scientific data integration, 2) multi-scale biological monitoring and 3) the networking of science." The expectation is that students will see the amazing scope of information directly available to researchers and the need to integrate other disciplines (e.g. computer science or information technology) into solving challenging biological questions.

**VI. Learning Outcomes**
At the conclusion of BI 104,students will:

1. Describe how vast amounts of data are being generated and integrated into science.
2. Describe or conceptualize how data is used to model scientific information from the cellular to the global scale.
3. Describe how various scientific disciplines are now integrated to solve biological questions.

**VII. Course Elements**
Grading will be based on student points earned from attendance, assigned homework, and two group projects. Homework will be discussed in class with assignments selected randomly from students at the beginning of class. Projects will focus on material and sources discussed in

classed and using a team approach to problem solving. Groups will be expected to present their work in class and lead any subsequent discussions.

**VIII. Grading Scale**

| | | | |
|---|---|---|---|
| A | Excellent | >90% | 180-200 points or more |
| B | Good | >80% | 160-179 points |
| C | Average | >70% | 140-159 points |
| D | Below Average | >60% | 120-139 points |
| F | Failure | <60% | 119 points or less |

**IX. Assignments and Grading**

| Specific Assignment | Points | % Of Grade |
|---|---|---|
| Attendance | 20 | 10% |
| Homework | 80 | 40% |
| Group Projects | 100 | 50% |

**XI. Additional Departmental and University Polices**

1. Electronic Devices

Use of music devices and cell phones is prohibited during all Natural Science and Mathematics classes at Chaminade, unless specifically permitted by your instructor. Use of cellphones and music devices in laboratories is a safety issue. In addition, use of cellphones and music devices in any class is discourteous and may lead to suspicion of academic misconduct. Students who cannot comply with this rule will be asked to leave class and may be subject to laboratory safety violation fines. You will be asked to leave class and marked absent if you do not comply. This will negatively affect your grade. Please refer any questions to the Dean of Natural Sciences and Mathematics.

2. ADAA Statement

2.1 Pursuant to several federal and state laws, including the Americans with Disabilities Act of 1990, as amended by the ADA Amendments Act of 2008, and Section 504 of the Rehabilitation Act of 1973, all qualified students with disabilities are protected from discrimination on basis of disability and are eligible for reasonable accommodations or modifications in the academic environment to enable them to enjoy equal access to academic programs, services, or activities. If a student would like to determine if they meet the criteria for accommodations, they should contact the Counseling Center at 808-735-4845 for further information.

3. Attendance & Tardiness

3.1 Students are expected to attend regularly all courses for which they are registered. Students should notify their instructors when illness or other extenuating circumstances prevents them from attending class and make arrangements to complete missed assignments. Notification may be done by emailing the instructor's Chaminade email address, calling the instructor's campus extension or by leaving a message with the instructor's division office (Natural Science and Math 1 (808) 440-4204). It is the instructor's

prerogative to modify deadlines of course requirements accordingly. Any student who stops attending a course without officially **withdrawing** may receive a failing grade.

3.2 Unexcused absences equivalent to more than a week of classes may lead to a grade reduction for the course. Any unexcused absence of two consecutive weeks or more may result in being **withdrawn** from the course by the instructor, although the instructor is not required to **withdraw** students in that scenario. Repeated absences put students at risk of failing grades.

3.3. Tardiness
Tardiness; Class begins at 9:30 AM and ends at 10:20 AM; there is no accepted variation to this schedule

4. Policy on Make-Up Tests
There are no extra points; the work expected from you in this course should be sufficient to obtain your desired grade. Make-Up exams will be decided on a case-by-case basis but are typically not given.

5. Policy on Communication
5.1 The University provides a Chaminade email address for all students. Official Chaminade communications will be sent to the students' Chaminade email address and instructors will use only this email to communicate with students. It is the responsibility of the student to check their email frequently. Report email-related problems to the Helpdesk at 808-735-4855 or helpdesk@chaminade.edu.

6. Laboratory Safety Information
The following guidelines are established to provide instructions in maintaining safety for students, staff, and faculty while using any of the science laboratories at Chaminade University. The Division of Natural Sciences and Mathematics (NSM), along with the University Environmental Safety Office are responsible for enforcing the regulations set forth in the current Student Handbook. Queries should be addressed to: Dean of Natural Sciences and Mathematics (808) 440-4204; Environmental Safety Officer (808) 739-4811

7. Title IX Declaration
Chaminade University of Honolulu recognizes the inherent dignity of all individuals and promotes respect for all people. Sexual misconduct, physical and/or psychological abuse will NOT be tolerated at CUH. If you have been the victim of sexual misconduct, physical and/or psychological abuse, we encourage you to report this matter promptly. As a faculty member, I am interested in promoting a safe and healthy environment, and should I learn of any sexual misconduct, physical and/or psychological abuse, I must report the matter to the Title IX Coordinator. Should you want to speak to a confidential source you may contact the following:
• Chaminade Counseling Centerl 808 735-4845.
• Any priest serving as a sacramental confessor or any ordained religious leader serving in the sacred confidence role.

8. Academic Honesty
Students are expected to have read and to abide by the "Student Rules of Conduct" which are available in your copy of Chaminade University's Student Handbook. Cheating in the form of plagiarism, collusion, deception and will not be tolerated and will negatively affect your grade.

9. The instructor may modify elements of this syllabus according to the operational needs of the class.

**Course content with tentative schedule**

| Week | Dates | Lecture Topic |
|---|---|---|
| **1** | 14 Jan | Digital age of biology |
| **2** | 22 Jan | Digital age of biology, continued |
| **3** | 28 Jan | DNA sequencing and the power of genomics |
| **4** | 4 Feb | DNA sequencing and the power of genomics, continued |
| **5** | 11 Feb | Protein databases; how sequence and domains help predict function |
| **6** | 17 Feb | Protein databases; how sequence and domains help predict function, continued |
| **7** | 25 Feb | Group projects |
| **8** | 3 Mar | Computational chemistry |
| **9** | 10 Mar | Computational chemistry, continued |
| **10** | 17 Mar | Microscopy and imaging |
| **11** | 24 Mar | Spring Recess |
| **12** | 31 Mar | Microscopy imaging, continued |
| **13** | 7 Apr | Medical imaging and image handling, continued |
| **14** | 14 Apr | Biodiversity and systems biology |
| **15** | 21 Apr | Biodiversity and systems biology, continued |
| **16** | 28 Apr | Group projects |
| **17** | 5 May | Group projects, continued if needed |