

Lab Skills Bootcamp and professional competencies

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MCB3015C section 24FB (for campus students) and section 24FD for DE students
Online only, Spring 2017

Course Coordinator

Monika W. Oli, PhD

eMail: moli@ufl.edu

Office Hours: TBA

Course will be hosted in Canvas: <http://elearning.ufl.edu/>

Website for syllabus: <http://microcell.ufl.edu/directory/faculty/monika-oli/>

Your TAs

Disa Rathore d.rathore@ufl.edu;

Jason Tones jtones1@ufl.edu;

Anabel Basualdo basualdo@ufl.edu;

Supreet Kaur skaur@ufl.edu;

Course overview

This class is designed to provide students with a variety of lab skills beyond actual bench work. Student is not expected to have much background in microbiology or lab based skills. Modules will be assigned to prepare the students for applying to research positions during undergraduate education, for graduate school. We teach non-bench lab skills which are usually not taught in any other class. These skills are a preparation for graduate school, professional school, government and industry position in (micro)biology.

The course design is based on case studies and real life scenarios. The activities are driven by computer based activities, tutorials and skills mastery. This course is best suited for a curious self-motivated student. Students are additionally expected to explore a variety of tools and resources independently.

Skills students should know and be able to apply by the end of the class include

1. Awareness of microbiology in every day life and interpretation and analysis of news reports and scientific literature
2. Biomath (metric conversions, bacterial enumeration, growth curves, data analysis, basic statistics, Excell functions, graphing...)
3. Bioinformatics skills (including cloning, primer design and PCR, BLAST analysis, etc.)
4. Knowledge of various software tools (i.e., Endnote, Prism/Sigma Plot, Gideon)

5. Familiarity with microbiology supply companies (ATCC, Difco BBL, Fisher, Sigma, BD, Remel) and development of a budget
6. Miscellaneous basic lab skills (writing and following SOPs, notebook keeping, reagent ordering and database management, grants)
7. Familiarity with common microbiological testing methods and quality control in the pharmaceutical and food industry
8. Awareness of industry guidelines and regulatory bodies
9. Experimental design and problem solving

Course time and location:

This course is taught asynchronously online and material will be available through Canvas. Classes begin the first week of the semester. Voluntary monthly student conferences/office hours will be arranged using Skype or Adobe Connect.

Student Evaluation

Student skill mastery will be assessed through weekly skills assessments and quizzes. Following instructions, self-motivation as well as creative thinking is a must in this class (part of participation grade). Mastery of skills (not memorization of material!) is expected for all modules and part your grade will come from semester long student projects. Topics should include something you are interested in, relevant to (micro)biology and your future career

Textbooks and Required reading: This course has no required textbook.

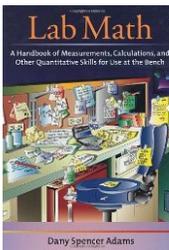


The following books are optional:

Get Ready for Microbiology

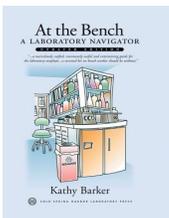
Lori K. Garrett, *Parkland College*

Judy M. Penn, *Shoreline Community College*



Lab Math: A Handbook of Measurements, Calculations, and Other Quantitative Skills for Use at the Bench

By Dany Spencer Adams



At the Bench: A Laboratory Navigator by *Kathy Barker*

Getting started

Course Correspondence as well as lab exercises, assignments and exams will be available via eLearning Canvas Website <http://elearning.ufl.edu/>. If you need any help with the eLearning system, please visit the eLearning Help page at <http://helpdesk.ufl.edu/e-learning-support/>. You may also contact the UF help desk at 352-392-HELP, Option 2. Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from LSS when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

1. Please Remember to check the **Announcements** in Canvas. "I did not know about the assignment, deadline..." is NOT an accepted excuse.
2. Please make sure you have a functional computer and download all necessary software (MS office, Endnote web, trial versions of other programs). We often will do computer-based exercises.
3. All assignments, projects and reports are submitted electronically through Canvas. Each assignment is processed through **Turnitin.com** and as such is checked for plagiarism.

Student evaluation

A	92
A-	90
B+	87
B	82
B-	80
C+	77
C	72
C-	70
D+	67
D	62
D-	60
E	<60</p>

Student skill mastery will be assessed through weekly skills assessments (assignments) and quizzes. Following instructions, self-motivation as well as creative thinking is a must in this class. Topics should include something you are interested in, relevant to (micro)biology and your future career ambitions. A final cumulative skills portfolio and reflection will count for 20% and reflects the final exam.

Items Graded	% Value
Skills assessment	40
Quizzes	20
Discussions	10
Public health project	10
Final skills portfolio and reflection	20
Total	100

Other UF policies

Make-up policy

Excused absences from exams and/or assignments follow the criteria of the UF Undergraduate Catalogue (e.g., illness, serious family emergency, military obligations, religious holidays) and must be communicated by formal signed documentation to the instructor prior to the missed exam or assignment. Appropriate documentation MUST be provided for the absence caused by serious illness, accident, jury duty or death in the immediate family. You MUST contact the instructor IN ADVANCE of the missed exam or assignment. An alternative deadline for exams and assignments will be arranged by the instructor.

Academic Honesty

In 1995 the UF student body enacted an honor code and voluntarily committed itself to the highest standards of honesty and integrity. When students enroll at the university, they commit themselves to the standard drafted and enacted by students.

The Honor Pledge: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.

On all work submitted for credit by students at the university, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

Students should report any condition that facilitates dishonesty to the instructor, department chair, college dean, Student Honor Council, or Student Conduct and Conflict Resolution in the Dean of Students Office. It is assumed all work will be completed independently unless the assignment is defined as a group project, in writing by the instructor. This policy will be vigorously upheld at all times in this course.

<http://www.dso.ufl.edu/sccr/honorcodes/honorcode.php>

(Source: 2011-2012 Undergraduate Catalog)

Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate. We highly recommend for each students to have MS Office (Mac or PC) installed on their computers.

Microsoft Software for UF students

<http://www.software.ufl.edu/>

The Office of Information Technology has great news for University of Florida students! If you want to upgrade your operating system or need Microsoft Office Suite, this media will be available in the Spring 2011 semester. Software is free for UF students.

To check for availability of the media and technical requirements, contact the UF Computing Help Desk at (352)392-HELP(4357). Once the media is available, you can get it at the UF Computing Help Desk or at the UF Bookstore .

Other software training opportunities are available. For examples through Lynda.com

<http://www.lynda.com/member.aspx>

Course materials

Please note that the course instructor considers all unauthorized online posting or distribution of course materials a form of academic dishonesty, and such actions will be treated accordingly. All course materials posted on the course website are assembled and intended for students taking this course. Unauthorized posting of course materials infringes on UF's copyright policies and the "Fair Use" Act. These policies will be vigorously upheld at all times in this course.

UF counseling services

Resources are available on-campus for students having personal problems or lacking clear career and academic goals that interfere with their academic performance. These resources include:

1. University Counseling Center, 301 Peabody Hall, 392-1575. Personal and career counseling.
2. Student Mental Health, Student Health Care Center, 392-1171. Personal counseling.
3. Sexual Assault Recovery Services, Student Health Care Center, 392-1161. Sexual assault counseling.
4. Career Resource Center, Reitz Union, 291-1601. Career development assistance and counseling.
5. **University Police Department:** 392-1111 or 9-1-1 for emergencies.

Services for Students with Disabilities

Please come and talk to your TA at the beginning of the semester about any accommodations required. We will make sure that the student's needs are met to the best of our abilities in the laboratory setting.

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. 0001 Reid Hall, 352-392-856 www.dso.ufl.edu/drc

Students requesting classroom/online accommodation must first register with the Dean of Students Office in Peabody hall. The Dean of Student Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation at the beginning of the semester.

Course evaluations

Students are expected to provide feedback on the quality of instruction in this course based on 10 criteria. These evaluations are conducted online at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu>.

Tentative Weekly Syllabus

Lab Skills Bootcamp and Professional Competencies

Week 1: Getting started and introductions

Out in the real world - Overview

Discussion: Introductions

Quiz: Global Awareness test (Procter and Gamble) - ungraded

Quiz: Pre-class test - ungraded

Responsible conduct of Research

Week 2: What is a lab? Getting oriented

Introductions

What is a lab?

Working in the Lab

Lab and academic hierarchy

Assignment: Labs and opportunities near you

Quiz: Finding a good PI

Your interview

Undergraduate research experience, internships

Skill needed in the real world

Week 3: Lab and Workplace Skills - Training and certification

UF Training: Biosafety, BBP and BMW (EH&S)

Hippa, Ferpa, sexual harassment

Lab rules and lab safety

IRB (working with humans) - Qualtrics (survey software)

IACUC (working with animals)

GLP, GMP (working in regulated environments) and SOPs

Project management training (PMP)

External training sources (Biotility, others)

Week 4: Scientific Literature, Plagiarism and Reference management

Scientific Literature and Reference Management

How to Cite Literature (Endnote Web)

PubMed, web of science, google scholar

Why is citing important?

Peer reviewed vs. non-peer reviewed

Journal club Interpretation & Analysis of Scientific Literature

Patents

Week 5: Communicating Science

Plagiarism

Communicating To The General Public

Writing A Scientific Research Article

Giving A Talk

Making a poster

Project: Public health projects – microbes in the News

Lab Meeting

Week 6: Instrumentation and lab tools

Microscope

Pipettes

Spectrophotometer

Balance

Centrifuge

pH meter

PCR machine

Gel electrophoresis, power supply

Imager....

Week 7: Data Analysis

Excel Tutorials

Basic statistical analysis

Analysis Tutorial

Other graphing software

Data management and analysis

Week 8 and 9: Labmath

Lab Math: why bother with math in microbiology

Lab Math Tools

Fun with dilutions, cell counts

Conversions

Lab Math practice examples and problems

Week 10 and 11: Bioinformatics

What is Bioinformatics?

NCBI

PCR and primer design

DNA

Phylogeny

Proteins

Genomes

Assignment: Applications and medial relevance of bioinformatics

Week 12: Soft Skills

Your SWOT analysis

Networking

Project management
Critical Thinking and Problem solving

Week 13: Funding and patenting research

Grants

Technology licensing invention disclosures

Patenting