College of Biological Sciences (CBS) Freshman Orientation

Associate Dean Susan Keen
slkeen@ucdavis.edu
We know you worked hard to join CBS.

SUCCEEDING REQUIRES PASSION

• Passion for the subjects you study will carry you through the difficulty of higher academics.
• The “right” major is the one you gladly spend time studying.

“Don't ask yourself what the world needs. Ask yourself what makes you come alive and then go do that. Because what the world needs is people who have come alive.”
- Dr. Howard Thurman
Succeeding requires honesty about skills and the discipline to study

- The classes are much larger than expected (hard to make friends).
- The material is challenging (13-15 units is plenty).
- You should expect to analyze, not memorize.

- Students are responsible for seeking help.
- You need to find the course materials on the Canvas site

- The quarter system moves quickly.
- Organization is extremely important.
- A lot of time should be devoted to studying.
Create and rely on a weekly planner

- To manage your time, consider:
  - The Carnegie rule—a student should spend at least two hours working outside class for every hour in class.
  - For 15 units, this means 15-20 hours in class (labs) and 30 hours outside class studying.
  - This means you should expect a 45-50 hour work week on school alone!!

- Using your planner:
  - Fill in the 15-20 hours in class.
  - Fill in 30 hours per week of high quality study time (two hours of study time for every unit of class).
  - Fill in your scheduled extra-curricular activities around school and see if your plan is realistic.
  - **Delayed gratification now may ensure future success.**
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<thead>
<tr>
<th>Time</th>
<th>Monday</th>
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<th>Wednesday</th>
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<tbody>
<tr>
<td>7:00 AM</td>
<td>Chem 2A 5 units</td>
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<td>Chem 2A</td>
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<td>Chem 2A lab</td>
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<td>3:00 PM</td>
<td>Classics 30 3 units</td>
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## Schedule of a successful student

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<th>Sunday</th>
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<tbody>
<tr>
<td>7:00 AM</td>
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<td>PMI 126</td>
<td>PMI 126</td>
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<td>NPB 100</td>
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<td>UCDMC</td>
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<tr>
<td>9:00 AM</td>
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<td>Work at BASC</td>
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<td>Study</td>
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<tr>
<td>10:00 AM</td>
<td>Study</td>
<td></td>
<td></td>
<td>Work at BASC</td>
<td>Study</td>
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<td>Study</td>
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<tr>
<td>11:00 AM</td>
<td></td>
<td></td>
<td>Davis Honors Challenge</td>
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<tr>
<td>12:00 PM</td>
<td>Lunch</td>
<td></td>
<td>NPB 100</td>
<td>Study</td>
<td>NPB 100</td>
<td>Study</td>
<td>Lunch</td>
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<tr>
<td>1:00 PM</td>
<td>Relax</td>
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<td></td>
<td>Office hours</td>
<td>Lunch</td>
<td></td>
<td>Relax</td>
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<tr>
<td>2:00 PM</td>
<td>Study</td>
<td></td>
<td>NPB 100</td>
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<td>Study</td>
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<td>3:00 PM</td>
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<td>Work at BASC</td>
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<td>Work at BASC</td>
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<td>4:00 PM</td>
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<td>PMI 126</td>
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<td>PMI 126</td>
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<td>Run</td>
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<tr>
<td>5:00 PM</td>
<td>Study</td>
<td>Run</td>
<td></td>
<td>Midterm Review</td>
<td>Davis Honors Challenge</td>
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<td>Run</td>
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<tr>
<td>6:00 PM</td>
<td>Dinner</td>
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<td>NPB 100</td>
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<td>Dinner</td>
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<tr>
<td>7:00 PM</td>
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<td>Dinner</td>
<td>Midterm Review</td>
<td>Dinner</td>
<td>Dinner</td>
<td>Study</td>
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<tr>
<td>8:00 PM</td>
<td>Gym</td>
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<td>Dinner</td>
<td>Gym</td>
<td>Relax/Social</td>
<td>Relax/Social</td>
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<tr>
<td>8:00 PM</td>
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<td></td>
<td>Davis HOPE</td>
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<td>Dinner</td>
<td>Gym</td>
<td>Relax/Social</td>
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<tr>
<td>9:00 PM</td>
<td>Gym</td>
<td>Meeting</td>
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<tr>
<td>Evening</td>
<td>Study</td>
<td>Study</td>
<td>Study</td>
<td>Study</td>
<td>Relax</td>
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</table>
Many professors provide useful learning goals

Lecture 14. More on Genetics

- How are the laws of probability applied to offspring formation?
- How does the genotype influence the phenotype?

Students should be able to:
- explain Mendel’s two laws
- predict the frequencies of particular offspring genotypes and phenotypes given parental genotypes
- diagram a test cross and explain possible outcomes
- explain the roles of multiple alleles, pleiotropy, and epistasis in determining the phenotype
- differentiate linked and unlinked genes and explain how crossing over affects linked genes
- explain the genetic basis of polygenic traits
What should I do during my study hours?

• **Review your notes after each lecture while listening to the podcast and looking at the lecture slide PDFs.** Fix your notes – you hear more the second time around.

• Mark the places where you are confused.

• Once you know what you don’t know, you can find out additional information via the textbook, office hours, or other resources.

• **Start with your textbook**
  
  • Textbooks aren’t novels – you need a reading plan.
  
  • Read the chapter to confirm your knowledge of a topic.
  
  • Abstract the chapter via headings, main points, and examples.
  
  • Interrogate the book.

Come to class, take good notes, fix the notes with the podcasts, form a study group, go to office hours, meet the learning goals. The next lecture will be easier to follow if you are prepared. Do the study questions and the reading.

PUT THE TIME INTO YOUR FUTURE
What if I don’t do well on multiple choice exams?

Don’t Worry: It’s a skill you can learn!

• If the wrong answers confuse you, then cover all the answers, read the question, and decide what the answer is. Look for only that answer in the list of choices.

• If you do poorly on a test, analyze your exam by asking why you got each question wrong.

• If you did not know the material, then study more, but if you skim the questions or don’t understand the questions, studying more will not help—read the questions slowly or seek confirmation of the question from the TA. Analyze your performance!
YOUR SCORE ON AN EXAM IS FEEDBACK – REFLECT ON IT.

• Always check your exam scores and then go over the exam.
• Start with the assumption that if you did not answer correctly, you do not understand the topic.
• Do not assume that the question is “odd” or “poorly written;” find out what you do not understand before the next exam.
• Find a study group
• Practice talking about the material and explaining it.
  • This is an important skill for most professions. Study groups help you become a better speaker and listener.
  • The only real test is a blank piece of paper; if you truly understand, you can answer any exam question
What do the top students do?

- Try for an A.
- Construct a framework for how the world works and follow-up on everything that does not fit into this framework. Don’t ignore what is not understood.
- Go to office hours.
- Attend SASC workshops and class tutoring
- Get to know some faculty.
- Become extremely organized.
- Study, study, study!

Take responsibility for your mindset and your education.
Creating Community While Exploring Biological Sciences

COHORT Program
the CBS First-Year Experience

Cohort Coordinator: Karyn O’Hearn; <kohearn@ucdavis.edu>  530.752.5012
Expect frequent and important emails; alert us if you are not receiving emails. Email is our primary line of communication!
Cohorts are Learning Communities

- Freshmen are divided among 6 cohorts to allow students to meet a smaller core group of CBS peers
- Students are grouped by dorm assignment

- Tercero and Off-Campus – Bacteria & Archaea (FALL BIS 005)
- Segundo – RAS & Excavata (WINTER BIS 005)
- Cuarto – Unikonta & Plantae (SPRING BIS 005)

*Housing is assigned in mid-August, stay tuned for BIS 005 class registration info*
BIS 005: Exploring Biological Sciences (1) P/NP

- Lecture – 1 hour. Introduction to UC Davis biology faculty, biology industry, and medical professionals. This course provides students with perspective on the scope of biology and the opportunities that are available at a major research university. To be taken one quarter during first year.

- Required course materials: i>clicker2.

- If you can’t take BIS 005 with your dorm and during your designated quarter, email Karyn O’Hearn <kohearn@ucdavis.edu>

http://biosci.ucdavis.edu/cohort-program/index.html or Google: “UC Davis Cohort Program”
Freshman Fall Welcome Breakfast

- SAVE THE DATE:
- September 25th
- 10:00 AM – 11:30 AM
- (Monday of Welcome Week.) Meet your Cohort
- Pick up your Cohort T-Shirt
- You will received an email with details and RSVP information
Student-Faculty Lunches

Discuss biology and life with a CBS faculty member over lunch

• Lunches occur, on average, once a week.
• Stay tuned for emails with available times/dates, and registration instructions
• Any CBS freshman can attend these meetings (Non-Cohort Specific).
• Lunches are limited to the first 15 students who sign-up.
• Lunch is catered to a UC Davis conference room

<table>
<thead>
<tr>
<th>place</th>
<th>food</th>
<th>topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>3061 SLB</td>
<td>pizza</td>
<td>Microbiology, One of Dr. Lin’s research interests is Molecular mechanisms of Calorie Restriction and Aging</td>
</tr>
<tr>
<td>3061 SLB</td>
<td>pizza</td>
<td>&quot;Professor Malof uses genetics and genomics to study how plants adapt to different environments.&quot; The Genomics Revolution. It cost $3,000,000,000 to sequence the first human genome. Now we can do it for less than $10,000. We will discuss how these technological changes are affecting research from basic biology to human genetics&quot;</td>
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</tbody>
</table>

NPB: Alex Mogilner mogilner@math.ucdavis.edu 11/13/2013 12:00 PM Arboretum pizza Computational Biology, Cell Biophysics, Mathematical Biology.

EVE: Jonathan Eisen jaeisen@ucdavis.edu 11/21/2013 12:00 - 1:30 2002 LSB pizza Microbiome, TED talk and discussion. "My research focuses on understanding the genomic basis for how microorganisms, for example bacteria, interact with other species to lead to new functions. We study this in many systems, from single microbes or communities of microbes living "symbiotically" inside a host, to communities of microbes in the environment".

MVIG: Lorena Navarro lonavarro@ucdavis.edu 11/22/2013 12:00 PM 3002 LSB pizza microbiology
CBS has 9 majors for a BS degree and 4 for a BA*

<table>
<thead>
<tr>
<th>Majors</th>
<th>BS or BA</th>
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<tbody>
<tr>
<td>Evolution, Ecology and Biodiversity (EEB)</td>
<td>BS or BA</td>
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<tr>
<td>Microbiology (MIC)</td>
<td>BS or BA</td>
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<tr>
<td>Biochemistry and Molecular Biology (BMB)</td>
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<td>Cell Biology (CBI)</td>
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<td>Genetics and Genomics (GGN)</td>
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<td>Neurobiology Physiology and Behavior (NPB)</td>
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<tr>
<td>Plant Biology (PLB)</td>
<td>BS or BA</td>
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<tr>
<td>Biological Sciences (BIS)</td>
<td>BS or BA</td>
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<tr>
<td>Marine and Coastal Sciences (CMS) is a CROSS-COLLEGE major where</td>
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<tr>
<td>CBS hosts one track called Marine Ecology and Organismal Biology</td>
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*The BA has a foreign language requirement, the BS does not.
All CBS majors have a core curriculum

<table>
<thead>
<tr>
<th>Major:</th>
<th>EEB</th>
<th>PLB</th>
<th>MIC</th>
<th>BIS</th>
<th>NPB</th>
<th>GGN</th>
<th>CBI</th>
<th>BMB</th>
<th>MCS</th>
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<tr>
<td>Degrees:</td>
<td>BS and AB degrees possible</td>
<td>BS degree only</td>
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<td><strong>Upper division</strong></td>
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<tr>
<td><strong>Statistics</strong></td>
<td>Stats 100, or 102, or 130 A + 130B</td>
<td>Stats 100 or 102</td>
<td>Stats 100</td>
<td>Stats 100 or 130 A + 130 B</td>
<td>Stats 100</td>
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<tr>
<td><strong>Upper division core</strong></td>
<td>BIS 101 + 105</td>
<td>BIS 101 + 103 + 105</td>
<td>BIS 101 + 103 + 105</td>
<td>BIS 101 + 105</td>
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<tr>
<td>Note: BIS 105 may be replaced by BIS 102 + 103 BIS 101 + 105.</td>
<td>Note: BIS 105 (Biochemistry) may be replaced by BIS 102 + 103. * check professional schools for number of biochemistry courses.</td>
<td>Two quarters of biochemistry is required and not optional.</td>
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<tr>
<td><strong>Upper division cell biology</strong></td>
<td>BIS 104</td>
<td>NPB 110A, + 110B, + 110C.</td>
<td>BIS 104</td>
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<tr>
<td><strong>Chemistry series</strong></td>
<td>Chemistry (CHE) 8A + 8B or CHE 118A + 118B + 118C</td>
<td>CHE 118A + 118B + 118C</td>
<td>CHE 8A + 8B</td>
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<tr>
<td><strong>Lower division core</strong></td>
<td>Biological Sciences (BIS) 2A + 2B + 2C Chemistry (CHE) ) 2A + 2B + 2C Mathematics (MAT) 17A + 17B + 17C or MAT 21A + MAT 21B Physics (PHY) 7A + 7B + 7C</td>
<td>Chem 3ABC is an option; 3A for Fall 17</td>
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Lower division curriculum notes: what courses should I start with?

The answer depends on your major and your placement exam scores.

- Students in the **BMB, CBI, GGN and MCS** majors:
  - **take Mathematics and Chemistry** in their first quarter, and add a 3rd science class (add Biology 2) by the end of the first year (winter or spring).

- This works ONLY if you scored well on the mathematics and chemistry placement exams.
- Trust the chem and math placement tests. **If you need workload classes, take this extra prep.**

- **All majors in CBS require Math 17 ABC**
  - Math 21 is a good alternative for students interested in more advanced math or the physical sciences (physics, p-chem, engineering). Math 21 M is an option.
    - **Caution! Math 21 is NOT a good alternative for most students if Math 17 is full.**
Lower division curriculum notes: what courses should I start with?

The answer depends on your major and your placement exam scores.

- **Students in the BIS, EEB, MIC and PLB majors:**
  - **take Biology and Chemistry** in their first quarter, and work up to 3 science classes (Chem, Biology 2, and Math) by the end of the first year.

- **Students in the NPB major:**
  - **take Biology and Math** in their first year, and take **Chemistry and Physics** in their second year.
    - This works ONLY if you scored well on the mathematics and chemistry placement exams.
    - **Trust the chem and math placement tests. If you need workload classes, take this extra prep.**

- **All majors in CBS require Math 17 ABC**
  - Math 21 is a **good alternative** for students interested in more advanced math or the physical sciences (physics, p-chem, engineering). Math 21 M is an option.
    - **Caution! Math 21 is NOT a good alternative for most students if Math 17 is full.**
Introductory Biology: Neither BIS 2A nor BIS 2B has a prerequisite.

Starting with BIS 2B will be a good plan for many students. They should take BIS 2B, then BIS 2C, and finish with BIS 2A as a good lead-in to BIS 101.

Starting with BIS 2A only works for “Chem 2A ready” students. Students will need a good high school chemistry class to know the chemistry required in BIS2A.

(Do they understand the difference between carbon and oxygen? What is the difference between a covalent bond and a hydrogen bond? What does pH mean? What is an electron? By lecture 5, can they recognize a molecule as a protein, a lipid, a sugar, or a nucleic acid after we have explained the distinguishing features of these molecules?)
Lower division curriculum notes: **BIS 2A Accelerated Course**

- Only offered Fall Quarter to students who have an exceptionally strong foundation in the basics of metabolism, heredity, & cell structure.

- Admission to BIS 2A Accelerated course:
  - 4 or 5 on AP Biology exam
  - 6 on IB Higher Level Biology exam
  - Pass Placement Exam at UCD offered the week prior to instruction

- To take Placement Exam, email Erin Easlon: bistwoa@ucdavis.edu
Special co-Class option: for students placing into workload classes (ALEKS, workload Chem, English or Math)

• Students should let us know if they are interested after this talk.
• They will receive an email invitation.
• Students enroll in workload classes, an Introductory Biology or chemistry class, and a special co-class (BIS 98) designed to support them in higher academics
• There are limited number of places in this co-class program, so students indicated interest at my presentation. If we have too many applicants we will select entrants at random and keep a wait list of those not selected.
Lower division curriculum notes: CBS encourages students to think carefully about electives.

We contributed to 4 electives that we believe will be helpful:

**Classics 30** explains the Greek and Latin roots of language and incorporates a lot of biological terms.

**Philosophy 31** introduces freshmen to scientific reasoning and analysis, useful for exams such as the MCAT (other good choices are PHI 5 or 12).

**History 2/STS 2** is “Introduction to the History of Science and Technology.” The course has a strong critical reasoning component, useful for exams such as the MCAT. It will be offered in Spring 2018.

**Philosophy 15** introduces freshmen to Bioethics.

Students should select other electives based on interest and should sample broadly. There are many good choices, including music, dance, art history, languages, and studies of other cultures. What does the person you want to become know about?
Things to be aware of:

- **ALL** required courses for CBS majors must be taken for a **LETTER GRADE**

- CBS tracks the number of units and enforces unit limits:
  - 200 units is expected, but at 200 units, students may petition for up to 225 units if they can graduate within this maximum.
  - AP and IB units are **not** included in this number.

- Students need **64 upper division units** to graduate.

- Students need at least **8 units in English Composition**, 4 units of which must be **upper division** (UWP 1, 18, 19; ENL 3; COM 1-4; NAS 5; UWP 101, 102 A-L, 104 A-F, I), or students may **pass the Upper Division Composition exam**.

  AP scores count in some cases for English Composition (consult the chart in the UCD General Catalog for rules).

Start with two science classes and build up as your confidence grows. **Consider adding a Freshman Seminar**—many choices.
Any grade below a C (2.0 GPA) is not adequate.

• Some professional schools do not accept applications from students with grades below a C in biology, chemistry, math, etc.
  • If you get a C- in a class required for professional school, you cannot repeat the course at UC Davis.; repeat Ds and Fs

• Look at the application rules for future programs early on.

• Contact information for future careers are in your handbook; see videos on the BASC website.

• Read the course syllabi and understand the grading schemes.

• Read about drop deadlines; incompletes; options for repeating classes; the effect of repeats on GPA; retroactive grade actions & withdrawals. Know your options!!

Learn to use OASIS, the GPA calculator, and the what-if function.
There is one site for CBS advising: BASC

All staff and peer advising takes place in the Biology Academic Success Center (BASC) in Sciences Lab Building, around the corner from the BioBrew Coffee Shop.

Students are called to mandatory advising in the fall/winter.

Faculty Master Advisors are associated with each major and can be visited in their departments.
How can advising help me?

Staff advisors at BASC help you in many ways:

- Mandatory advising
- Academic advice on particular majors
  - Making an academic plan and choosing courses
  - Advice on changing majors
  - Progress toward degrees and GE
- Academic difficulties
  - Leave of absence from school
  - Student petitions
  - Special situations
  - Referrals to other campus services
  - Bring in your problems as soon as they happen.

Peer advisors:
Fellow students have shared your experiences.
Research and Internship Opportunities

• The current faculty count in the College of Biological Sciences is about 130.

• There are about 700 biologists on campus. They offer a wide range of research opportunities all available to you.

• 90% of our undergraduates in biology do some form of internship or research before they graduate.

• Research is fun and you can highlight your ability to apply knowledge on your resume.

Some students join the author team on a published paper.

**Rewards:** Taste of the field; letter of recommendation(s); expanded skills & contacts.

**Risks:** Time away from studying; balance and time management may be more difficult.
Research and Internships

- Speak with your BASC advisor
- Talk to your faculty adviser or other faculty
- Do well in a faculty member’s class
- Visit the Internship and Career Center (ICC)
- See Undergraduate Research Center (URC)
- Be active and informed in contacting faculty

You can get research (PUF) and travel grants

Mailing out resumes for internships is generally not successful. How would you decide who take into your lab? Students need contacts and references to help them move forward.
Other opportunities:

- Education Abroad
  - Study Abroad Program Office is located at 207 Third St.; Ste. 120
- UCD Washington DC Program
  - Internship e.g. environmental group
- Marine Biology Lab at Bodega Bay (spring and summer quarters)
  - Credit for **internships** is limited to a total of **6 units** that can be used towards graduation.
  - Credit for **tutoring** is limited to a total of **3 units** that can be used towards graduation.
Majors

- Majors differ in the way they ask questions. Does a student prefer “how” questions or “why” questions? What sort of research problems are interesting?

Students are choosing a model system for learning how to think, so they should choose a system they find fascinating.

- All majors in CBS are considered “pre-med” majors. Visit the Health Professions Advising (HPA) website to see what additional information is available.

- Medical schools are increasingly interested in students having a broad outlook so majors such as Plant Biology & Evolution, Ecology and Biodiversity may be ideal choices (or even a major in Music!).

- A backup plan for one’s future is always encouraged.

Put your educational pathway, the classes and research, together in a way that serves your unique interests.
Department name may not be the same as the major: department codes help identify classes

<table>
<thead>
<tr>
<th>Departments</th>
<th>Majors</th>
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<tr>
<td>Evolution and Ecology (EVE)</td>
<td>Evolution, Ecology and Biodiversity (EEB)</td>
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<td>Microbiology and Molecular Genetics (MMG)</td>
<td>Microbiology (MIC)</td>
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<td>Neurobiology Physiology and Behavior (NPB)</td>
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<td>Plant Biology (PLB)</td>
<td>Plant Biology (PLB)</td>
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<tr>
<td><em>(College wide major, no Dept. code)</em></td>
<td>Biological Sciences (BIS)</td>
</tr>
<tr>
<td><em>A cross-college major—no Dept code</em></td>
<td>Coastal and Marine Sciences (CMS) where CBS host the Marine Ecology and Organismal Biology track</td>
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</tbody>
</table>
BIS Major: Students complete a broad set of preparatory courses and select one or more areas to focus on for their upper division specialization.

Biology is a good foundation for any career, so don’t forget about environmental law or science writing, in addition to more traditional paths.
Learn how the internal timer/circadian clock allows plants and humans to regulate their physiology.

Revealing organismal differences by analyzing DNA sequences, chromosomes, and gene expression!

**PLB Major:**
- Guaranteed research opportunities
- Hands-on experience in modern life science research
- Designated scholarships
- Contributions to human health and environmental stewardship
Evolution, Ecology & Biodiversity (EEB)

Understanding global biodiversity— from the evolution of genomes to the behavior of species and the functioning of communities across the Tree of Life

- Broad and balanced exposure to biology
- Understanding the diversity and distribution of living organisms
- Application of ecology and evolution to all life sciences, including disease
- Darwinian Medicine class
Microbiology (MIC)

Microbes are the most abundant (and ancient) organisms on earth, many are pathogens... but most are not.

- Microbiology majors learn about the microbial world and the interactions of microbes and their environment.
- Microbiology is great training for medical fields since many diseases are caused by microorganisms.
All complex biological phenomena have their root in mechanisms that operate at the cellular level.

Studies in cell biology ask questions such as:

- How does a cell divide and communicate with other cells?
- Why do some cells become cancers?
- How do cells age and die?
- What are stem cells and what are their magical properties?
- How do cells become infected with viruses e.g. HIV?
GENETICS & GENOMICS

Study of genes, hereditary, and variation in a wide range of model systems
Introduces students to the chemistry of living organisms

Training in the experimental techniques that are used to probe the structures and functions of biologically important molecules

Students who enjoy both chemistry and biology and who are comfortable with quantitative approaches to problem solving will find this major a rewarding field of study
Students in this major will study functional mechanisms, as well as the control, regulation, integration, and behavior that relate to these mechanisms at the level of the cell, organ system, and organism.
Coastal and Marine Sciences—marine ecology and organismal biology track

Field work is a key component of this track

Study the ecology and organismal biology of the marine environment. Delve into the physiological adaptations of organisms and the biology of marine species from the molecular to population levels.
How should I approach my program of study?

- Develop your own idea of what it means to be an educated person.
- Read the campus, college, and major requirements and list needs.
- Follow the prerequisites for each course to determine order of classes.
- Experiment with the number of science classes you can handle each quarter. Start with a 1 or 2, but work up to 3 to make progress toward your degree.
- Come to mandatory advising (by February 2, 2018) with a sense of how your studies are going so that we can give you individualized advice.
- Consider whether you will be going to summer school.
- Consider whether/when you will take exams such as MCATs or GREs.
- If you are pre-health, take the Health Professions Advising Workshop series appropriate for each year of your studies (FR, SO, JR, SR).
CONGRATULATIONS ON YOUR ADMISSION!

WELCOME TO THE COLLEGE OF BIOLOGICAL SCIENCES!