Department of Chemistry and Biochemistry

New Undergraduate Majors Orientation Summer, 2015

Dr. Robert Vellanoweth
Chair
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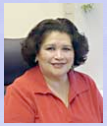
Dr. Alison McCurdy
Associate Chair
amccurd@calstatela.edu

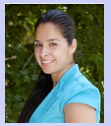
WELCOME!

Some Key People:

Department Chair:
Dr. Robert Vellanoweth
- vllnwth@calstatela.edu
- 323-343-2300, BS 336 (Department office)

Department Office Staff:
Ms. Jesse Murillo Ms. Maribel Estrada





- 323-343-2300, BS 336 (Department office)

Some Key People:

Stockroom Manager:
Mr. Bill Wimberley
- 323-343-2345, ASCB 251

Manager of Instructional Labs:
Dr. Errol Mathias
- 323-343-5648, ASCL 132

Labs: Goggles, notebook, Breakage card from the cashier!

Some Key People (outside the Department):

Interim Dean of the College of Natural and Social Sciences:
Dr. Scott Bowman
- 323-343-2000, ACSB 223

Provost and Vice President for Academic Affairs CSULA:
Dr. Lynn Mahoney

President of CSULA:
Dr. William A. Covino

Some Key Places:

Department Office – 3rd floor Biological Sciences BS 336

Library Palmer Wing (Testing Center)

Faculty Offices, Teaching labs, research labs

Annenberg Science Complex:
- "Wing B" or ASCB (27B)
- La Kretz Hall or ASCL (27A)

Some Key Websites:

Department:
web.calstatela.edu/dept/chem/index.htm
(has an undergraduate handbook!)

NSS Advisement Center:
http://www.calstatela.edu/nss/nss-academic-advisement-center

Quarter to Semester website:
http://www.calstatela.edu/student-information-center

E-catalog, myCSULA

Breakout Session #1

In groups of 3-4, introduce yourselves, your major, your career goals, and tell everyone something surprising about you.

(optional!)

Some general advice…..

- Adapting to quarters after semesters - FAST PACE!
- Talk to your professors if you need help. Or even if you don't! (This helps you get letters of recommendation!)
- Meet your classmates and form study groups!
- Rule of thumb: **Study 3 hours outside of class per unit per week**. More for harder classes!
- You need to think about your GPA (for the next stage in your career), so make sure the **balance of school and other commitments allows you to focus on academic success**.

Some general advice…..

Get involved with extracurricular activities such as:

- Chemistry and Biochemistry Club
- Pre-Pharmacy Club
- Cancer Research and Awareness Society

Depending on your career goals, there are other experiences outside the classroom:

- Volunteering at a hospital
- Getting involved in research

There is a Health Careers Advisement Office
http://web.calstatela.edu/programs/healthcareers/
BS 170, 174 healthcareers@calstatela.edu

Undergraduate Degree Programs

Students graduate with:

1. Knowledge of the Field - Theoretical and Practical

- Chemistry and Biochemistry - the *molecular* sciences
- New discoveries all the time
  - ✓New molecules
  - ✓New methods
  - ✓Answers to problems in environment, health, etc.

2. Problem-solving Skills
3. Experience with Teamwork
4. Effective Communication Skills

Undergraduate Degree Programs

B.S. Chemistry or B.S. Biochemistry

- Suitable for students seeking:
  - Entry-level jobs as chemists
  - Entry into a graduate research program (M.S., Ph.D., etc)
  - Entry into health professions schools
- Laboratory-intensive
- Honors Program available
- General Chemistry is the foundation; degree then focuses on subdisciplines: Analytical, Biochemistry, Inorganic, Organic, Physical
- Minor in Bioinformatics and Computational Biology
- Opportunities for Research Experiences!!

Planning for timely graduation

- Know the Degree Requirements
  - Degree Checklist (handout)
  - **ORDER MATTERS!** Visual Scheme of pre-requisites/ordering of classes; Roadmaps
    - You must finish organic chemistry before starting biochemistry
    - You must finish MATH 208 and PHYS 213 before starting physical chemistry (CHEM 401)

Jargon

What do the course numbers and number of units mean? 100-level is Freshmen; 200-level is Sophomore; 300-level is Junior; 400-level is senior. 300-400 level is called "upper division"

CHEM 101† - General Chemistry I (5)

A course may include:

- Just lecture or
- lecture and lab or
- lecture and lab and recitation or
- just lab!

How do you know? Check the catalog!

For General Chemistry , there are 3 lecture units (=3 x 50 minutes of lecture) and 2 lab units (= 2 x 3 hours of lab).

(Lists don't tell you what order you need to do them in!)

BS Chemistry
Lower Division Required Courses (64 units)

***Upper division credit.*

CHEM 101† - General Chemistry I (5)
CHEM 102† - General Chemistry II (5)
CHEM 103† - General Chemistry III (5)
CHEM 291A - Organic Chemistry (3)
CHEM 291B - Organic Chemistry (3)
CHEM 292A† - Organic Chemistry Laboratory (2)
CHEM 292B† - Organic Chemistry Laboratory (2)
MATH 206 - Calculus I: Differentiation (4)
MATH 207 - Calculus II: Integration (4)
MATH 208 - Calculus III: Sequences, Series, and Coordinate Systems (4)
MATH 209 - Calculus IV: Several Variables (4)

MATH 215 - Differential Equations (4)
or
** MATH 401 - Differential Equations (4)

PHYS 211 - Mechanics (5)
PHYS 212 - Waves, Optics and Thermodynamics (5)
PHYS 213 - Electricity and Magnetism (5)
PHYS 214 - Modern Physics (4)

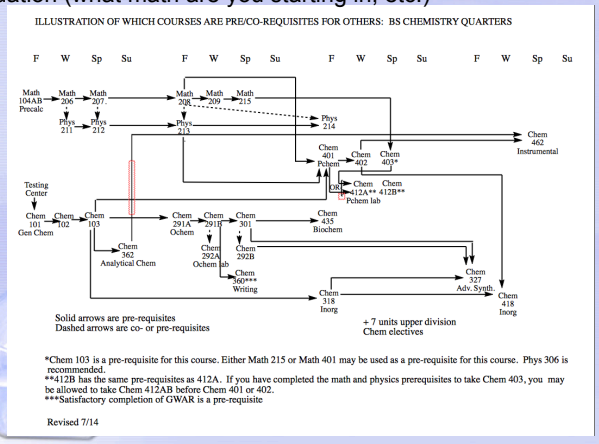
BS Chemistry
Upper Division Required Courses (46 units)

CHEM 301 - Organic Chemistry (3)
CHEM 318 - Introduction to Inorganic Chemistry (3)
CHEM 327† - Advanced Synthetic Methods (2)
CHEM 360 - Writing for Chemists (4)
CHEM 201† - Quantitative Analysis (5)
CHEM 362† - Quantitative Analysis (5)
CHEM 401 - Physical Chemistry I (4)
CHEM 402 - Physical Chemistry II (4)
CHEM 403 - Physical Chemistry III (4)
CHEM 412A† - Physical Chemistry Laboratory (2)
CHEM 412B† - Physical Chemistry Laboratory (2)
CHEM 418 - Inorganic Chemistry (3)
CHEM 435 - Introduction to Biochemistry (4)
CHEM 462† - Instrumental Analysis (6)

Upper Division Electives in Chemistry (7 units)

Select 7 upper division units with adviser approval. May include a maximum of 3 units of CHEM 499.

This scheme shows the order of classes – but adapt it to YOUR situation (what math are you starting in, etc.)



BS Biochemistry
Lower Division Required Courses (69units)

CHEM 101† - General Chemistry I (5)
CHEM 102† - General Chemistry II (5)
CHEM 103† - General Chemistry III (5)
CHEM 280 - Introduction to Biomolecules (3)
CHEM 291A - Organic Chemistry (3)
CHEM 291B - Organic Chemistry (3)
CHEM 292A† - Organic Chemistry Laboratory (2)
CHEM 292B† - Organic Chemistry Laboratory (2)
BIOL 100A - Introductory Biology I (5)
BIOL 100B - Introductory Biology II (5)
MATH 206 - Calculus I: Differentiation (4)
MATH 207 - Calculus II: Integration (4)
MATH 208 - Calculus III: Sequences, Series, and Coordinate Systems (4)
MATH 209 - Calculus IV: Several Variables (4)
PHYS 211 - Mechanics (5)
PHYS 212 - Waves, Optics and Thermodynamics (5)
PHYS 213 - Electricity and Magnetism (5)

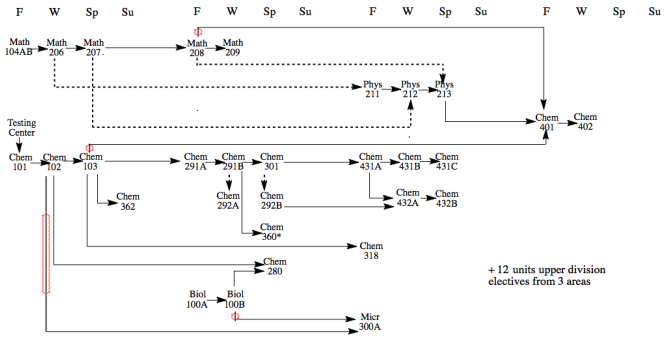
BS Biochemistry
Upper Division Required Courses (40 units)

CHEM 301 - Organic Chemistry (3)
CHEM 318 - Introduction to Inorganic Chemistry (3)
CHEM 360 - Writing for Chemists (4)
CHEM 362† - Quantitative Analysis (5)
CHEM 401 - Physical Chemistry I (4)
CHEM 402 - Physical Chemistry II (4)
CHEM 431A - Biochemistry (3)
CHEM 431B - Biochemistry (3)
CHEM 431C - Biochemistry (3)
CHEM 432A† - Biochemistry Laboratory (2)
CHEM 432B† - Biochemistry Laboratory (2)

Upper Division Electives (12 units)

Choose one course from Chemistry, Development/ Physiology, and Genetics/Biometrics. The total number of these elective units must be at least 12.

ILLUSTRATION OF WHICH COURSES ARE PRE/CO-REQUISITES FOR OTHERS: BS BIOCHEMISTRY QUARTERS



Solid arrows are pre-requisites
Dashed arrows are co- or pre-requisites

*Satisfactory completion of the GWAR is a pre-requisite

revised 7/14

Planning for timely graduation

- Course offerings: some courses are offered more than once a year, some only once! See Course Offerings Schedule

First year

•Passing the Placement Test is needed to take CHEM 101 (Testing Center in Palmer Wing of Library)
•Start your math right away! http://web.calstatela.edu/academic/math/GeneralMath.html#elm

- Do NOT take GE math classes (MATH 100, 102, 109) – this requirement is covered in your major
- DO take Precalculus (MATH 104A, 104B), then MATH 206, 207, etc. (where you start depends on your math placement – you may be in 89, 90, 91).

- Start your majors classes right away! (CHEM 101)
- Try to complete Block A in your first year as well
  - Take NSS 101 in your first quarter
  - ENGL 101
  - Other Block A: COMM 150, Critical Thinking

Planning for timely graduation

If needed classes are closed:

- Come to the first day of class in case instructors can add you
- Sometimes additional sections are authorized, so be alert

As you progress in your studies, you may want to get a minor…Our department offers a Minor in Bioinformatics and Computational Biology!

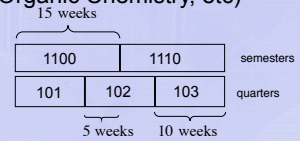
What's coming up? The Semester Calendar! Fall 2016

- **Students who began their academic programs under the requirements of the quarter system may choose to complete their requirements with semester course equivalents, or they may switch to the new semester program requirements in place after conversion.**

- **Academic advisors will work with students to develop an Individualized Advisement Plan that maps out their academic requirements for a timely graduation.**

What's coming up? The Semester Calendar! Fall 2016

At this point, try to complete any yearlong series (General Chemistry, Organic Chemistry, etc) BEFORE Fall, 2016.



Worst case: If you have only taken CHEM 101 before Fall 2016, due to missing 5 weeks of material you will have to take CHEM 1100 to be able to take the second semester

If you have only taken CHEM 101 and 102 before Fall 2016, due to missing 10 weeks of material you will have to take CHEM 1110 to finish the series.

HOWEVER: the department is planning to offer "Bridge" courses so you don't have to take the same material twice – stay tuned!

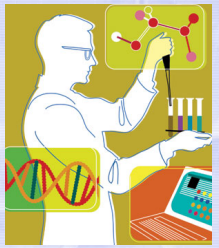
Breakout Session #2

Plan what you will be taking the first two years at CSULA, in your Major.

(Later, please also add in your GE courses)

GE Notes for our major:
Block A4 satisfied by MATH 206
Block B2 satisfied by Phys 211
For BS Biochem only, Block B1 is satisfied by Biol 100A

Careers in the Molecular Sciences - Chemistry and Biochemistry



(FYI – only if there is time!)

Skills you develop as a chemistry or biochemistry major:

- Communication
- Recordkeeping
- Theoretical & practical knowledge
- Critical thinking, Problem solving
- Technical skills
- Operation of scientific equipment
- Information handling & organization
- Safety
- Teamwork

These skills prepare you for a wide variety of career choices, including graduate and professional schools!

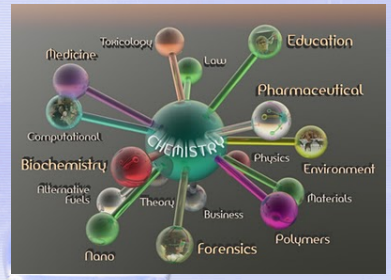
For Health Professions, go to the experts for more information!

Pre-Health Professionals: visit the CSULA Health Careers Advisement Office!

web.calstatela.edu/programs/healthcareers/
Biological Sciences 170, 174
323-343-6062
healthcareers@calstatela.edu

Chemistry - the central science

•Chemists develop products to sustain/improve quality of life
•Careers cross boundaries (biology, physics)
•Not just bench work -- not working alone!



•Pharmaceutical
•Biotech
•Environment
•Forensics
•Toxicology
•Biomedical Research
•Materials/Polymers
•Education
•Sustainable Energy

http://newellfondamathandscience.blogspot.com/

Careers you may not think of…

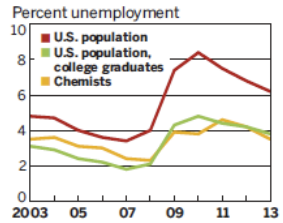
•Technical writing
•Science Librarian
•Art restoration
•Cosmetic Industry
•Agriculture/food chemistry
•Consulting
•Intellectual Property Law
•Market Analysis for Investment Firms
•Technical sales and service

What degree are you seeking ultimately --Bachelor's? Masters? Ph.D.?

A higher degree means…
•Higher paying jobs, lower unemployment
•Different career options
  •Teaching at a university vs. high school
  •Having a management position or not
  •Different responsibilities and rewards
•Will you ***be paid*** for getting the degree?

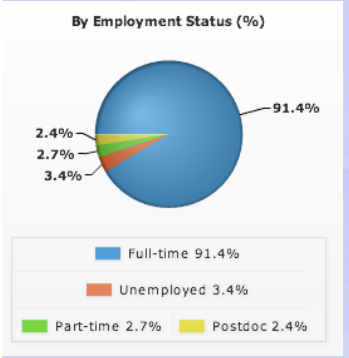
Unemployment among ACS members is low.

UNEMPLOYMENT Chemists fare significantly better than the U.S. population but about the same as other college graduates.



NOTE: Data are for March each year and exclude those fully retired or otherwise not seeking employment. U.S. population data are for ages 25 and older.
SOURCES: Annual ACS salary and employment surveys, Bureau of Labor Statistics

In 2013:

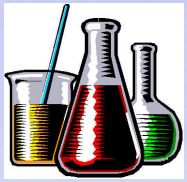


What are typical employers?

Industrial Chemistry Careers
•Industrial R&D (develop new technologies) and Production (translates research into scaled up manufacturing process)
•Industrial Sales, Marketing, Technical Service

Academia
•Faculty position (HS, community college, university, etc)
•Support positions (lab technicians, stockroom managers, safety officers)

Government
•National Labs
•Regulatory bodies (EPA, FBI, FDA, ATF)



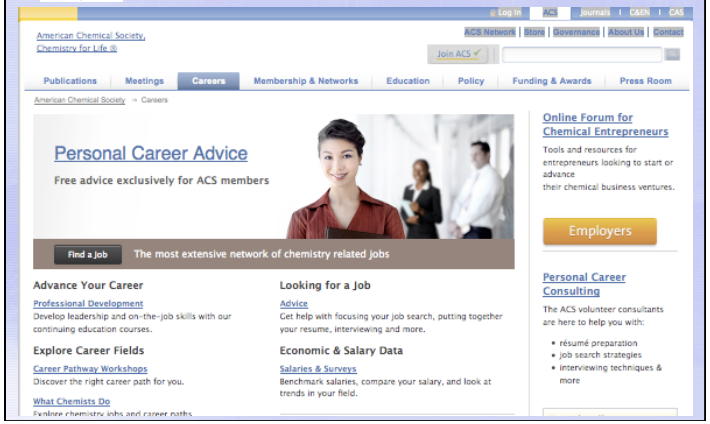
Choosing a Career…

Find a career that matches your skills, values, and interests!

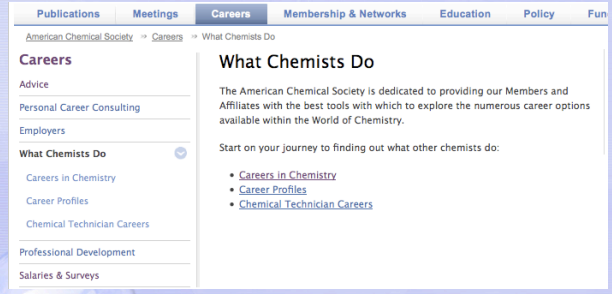
1. Learn about the Job Market

•American Chemical Society (ACS) Web page, Chemical and Engineering News. Shifting economy; increased Globalization

American Chemical Society website has resources….



American Chemical Society website has resources….



http://www.acs.org/content/acs/en/careers.html

Choosing a Career…

Find a career that matches your skills, values, and interests!

1. Learn about the Job Market (continued)

•American Society for Biochemistry and Molecular Biology (ASBMB) web page

http://www.asbmb.org/

ASBMB Website also has resources…

Choosing a Career…

Find a career that matches your skills, values, and interests!

1. Learn about the Job Market
   - U. S. Bureau of Labor Statistics, at www.bls.gov has the Occupational Outlook Handbook. For example:

http://www.bls.gov/ooh/life-physical-and-social-science/biochemists-and-biophysicists.htm

Bureau of Labor Statistics Website

Choosing a Career…

Find a career that matches your skills, values, and interests!

2. What are your strengths and values?

•Reflect on your education, your skill set

•It is best to avoid conflicts between your job responsibilities and your values (what you feel is important)

Choosing a Career…

Think about the 6 values shown below, and do your best to rank them by importance (1 is most important)

* **Advancement** (the need for an opportunity for promotion and recognition)
* **Autonomy** (the desire for freedom and ability to be self-directed)
* **Challenge** (the drive to overcome obstacles and solve difficult problems)
* **Security** (the need for stability and predictability)
* **Balance** (the desire for equilibrium between personal and business)
* **Altruism** (the opportunity to contribute to the welfare of others)

Choosing a Career…

Advancement
Autonomy
Challenge
Security
Balance
Altruism

•What does your ranking suggest about the kind of career you would be best working in?
•What does it suggest about the type of employer (large or small; academic or industry?)?
•What does it suggest about the kind of role you might best play (research, management, project leader, other)?

Some other considerations

- What do you like to do? What energizes you?
- Do you want to do lab work/research?
- Where do you want to work?
- What do you want to wear to work?
- How often do you want to change projects?
- What sorts of hours do you want to work?
- Are you willing to travel?
- What sort of funding situation do you want to be in?
- What nonscience interests or skills do you want to use?
- How important is your income level?
- What sort of stress levels do you want to deal with?
- Would you like to work independently or as part of a team?

Choosing a Career…

Do you have the skills to do successfully what you want to do? If not, what is needed?

Can you do a particular job you´re considering? If not, what training or skills do you need to develop?

GET SOME EXPERIENCE: Work in a research lab; do an internship at a company, volunteer at a hospital, etc.!

Breakout Session # 3

In your group of 3-4, each of you discuss

1. What is your career goal?
2. What motivates you to pursue that goal?

UPCOMING CHEM/BIOCHEM INFORMATION SESSIONS

Stay tuned for an invitation to the Fall Orientation Event with Chemistry and Biochemistry Department Faculty

While you are at CSULA, you will discover/confirm what you love to do and what your strengths are.

Combine these with your degree in Chemistry or Biochemistry and pursue a satisfying and rewarding career!

Thanks and good luck!