

**BSC 1010C CRN 16605: General Biology I**  
**Fall, 2023 (4 credit hours)**  
**Mixed-Mode format**  
***Valencia College East Campus***

**Instructor:** Dr. Jennifer Archer

**Office Hours:** send an e-mail or PM

**Web Site and Lab Web Site available through Atlas “My Courses”**

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**Course Description:**

Welcome to the General Biology I (BSC1010C) course. This course, and the accompanying laboratory, provides a foundation for future advanced biology courses and is primarily intended for those students who plan on majoring in Biology or for those students who plan to pursue a career in the allied health sciences such as nursing, MD, Pharmacist etc. This class is NOT an elective and should never be substituted for BSC1005, which can be taken as an elective or core requirement for certain declared majors. Make sure to check with your academic adviser if this course is required.

The course focuses on the cellular and molecular portion of biology. It emphasizes the basic principles and unifying concepts of modern biology. These include, but are not limited to, the chemical structure of living matter, the structure and function of living cells, the major metabolic functions of cells, reproduction, genetics and evolution.

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**Course Objectives:**

1. Please see the complete list of learning outcomes beginning on page 11. It is expected that all students will have an understanding of outlined concepts by the end of the course. This course is a foundation course that provides the prerequisite knowledge needed by your future biology and health science courses.
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**Textbooks:**

Required: (You must purchase these from the Valencia bookstore page online. Do not purchase elsewhere or the codes will not work and you will have to pay extra for one!) Choose one of these options:

1. **9780137351824** – Campbell Biology, 12e Vol 1 Mastering code only w/etext (18 month access) (\$48.99 net to bookstore) (This is the electronic copy of the textbook)
2. **9780137351916** – Campbell Biology, 12e Vol 1 Package - Custom text + Mastering code w/etext (\$88.99 net to bookstore) (This is the physical copy of the textbook)

For your labs you will also need a lab manual:

2. Fundamentals of Biology 1 Bundle 22' ISBN 9781774941379 This comes with TopHat, an interactive learning experience.
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## Other required materials and technology requirements:

1. **Use of Canvas:** The College uses the Canvas learning management system (LMS). The following link provides answers to common questions students may have about Canvas:  
<https://valenciacollege.edu/faculty/canvas-resources/student-faqs.php>  
The following link lists the minimum computer requirements to successfully run Canvas:  
<https://community.canvaslms.com/docs/DOC-10721-67952720328>  
If you have any concern about whether your computer system is sufficient to support Canvas, please read this document. **Please note – while Safari can be used for Canvas, Pearson has announced that Safari is not compatible with MasteringBiology. If you own an Apple-based system and use Safari, you will need to install a second browser to use to complete the required MasteringBiology assignments. The recommended browsers are Chrome and Firefox.**
2. **A webcam.** In addition to the minimum requirements you are also required to have a webcam, either integral to your system or as an addition to your system. If you do not own one you may be eligible to borrow a laptop from Valencia free of charge. This must be on a desktop not your phone or tablet.
3. **A microphone.** This can be a standalone microphone, integral, or part of a headset attached to your computer. You may also use the built in microphone of your smartphone.
4. You must download or use the web versions of **Microsoft word** and **Microsoft Excel** from canvas. You must use these applications to guarantee compatibility as other software may not work properly. You can download all Microsoft office applications from your Atlas account. Did you know that all of this is free for students?
5. You must download the **Microsoft Teams App** to either your phone or your computer to access the lectures (Required) and to post discussions. Please do not use the web version it runs poorly. This is also available in Atlas as part of the Microsoft enterprise suite. You must use your official Valencia e-mail to login.
6. You will be required to install the **HonorLock** Chrome extension. This is a free tool used to take exams and prevent cheating.
7. You will use **Pearson’s Mastering Biology** for your **homework**. You will access this website directly through Canvas. Please contact the Publisher for all non-content related inquiries. Treat labs as if they are a separate class with their own exams.
8. **A portable computing device-** this can be any smart phone, tablet, laptop or other smart device that will allow you to access Microsoft office applications, the internet, and your textbook if you choose the virtual option. You must bring this to class with you.
9. **TopHat** which comes with your lab notebook. You will be required to access and utilize this platform as directed by the professor.

## Valencia College Core Competencies:

The faculty of Valencia Community College has identified four core competencies that define the learning outcomes for a successful Valencia graduate. These competencies are at the heart of the Valencia experience and provide the context for learning and assessment at Valencia Community College. You will be given opportunities to develop and practice these competencies in this class. The four competencies are:

1. **Think** – think clearly, and creatively, analyze, synthesize, integrate and evaluate in the many domains of human inquiry
  2. **Value** – make reasoned judgments and responsible commitments
  3. **Act** – act purposefully, effectively and responsibly
  4. **Communicate** – communicate with different audiences using varied means
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Coordinator/Equal Opportunity Officer, 407-582-3421, rkane8@valenciacollege.edu, regarding requests for alternative arrangements relating to pregnancy.

## Class Policies:

- 1. Communication:** **Students are responsible for checking their official Valencia e-mail and Canvas announcements daily!** The only current way to reach me outside of class is electronically through Microsoft Teams or e-mail. If you have a message that is private in nature then either send a PM through Teams or an e-mail. Otherwise if other students could benefit from your question then post this in the Teams live feed. Please contact me whenever you are not 100% sure of something. Good chance is if you ask a question **YOU ARE NOT ALONE** and the entire class will benefit from the answer so you will be a **HERO!** Did you know due to the "Sunshine laws" all e-mail is **public record**? Now you do! If you have anything very sensitive you need to share with me that you wish to remain off public record (please don't tell me about your leaky oozy... I'm not that kind of doctor okay?), please leave your phone number in the e-mail and I will get back to you as soon as possible. **Note the professor NEVER checks e-mails on weekends. If you have an urgent matter that can not wait always send a PM through Teams.** PM is the preferred method of contact as it will notify me where as e-mail notifications are shut off due to there being too high a volume from non-students. I will respond to your message by the next business day.
- 2. Attendance:** To demonstrate activity in the class students will be given at least 1 attendance quiz per week online which also counts as a grade. The answers to the quiz are found in the recorded lectures. Students are expected to watch the recorded lectures and attend the live lab session. In addition, you will also post about the topic discussion in Microsoft Teams **You must take the attendance quiz and post in the discussion by the end of the week (posted date and time). No extensions will be granted to any student. It is highly recommended to make your first post by Wednesday of Each week. Students who miss more than one lab will drop an entire letter grade at the end of the semester if the absence is not excused per missed lab. Note:** all lecture assignments are due at the end of each week on Sunday 11:59PM no exceptions! However, the weekend is NOT considered business hours. Students are expected to complete all of their assignments by the Friday of each week and use the weekend as a backup in case an emergency happens. "I got sick on Monday" is not an excuse to not have your homework in by Sunday (unless you have a documented major medical issue such as severe Covid-19). You are given an entire week, please be proactive and plan accordingly. School is a priority. Students who do not participate online will be deactivated in Canvas after 3 weeks of consecutive absence and must e-mail the professor to become reactivated. After 4 weeks the student will be withdrawn if before the withdraw deadline (See withdrawal section).
- 3. Missed assignments:** Coming to class in person and performing online coursework are mandatory. Any unexcused absence or failure to submit work by the deadlines leads to automatic forfeit of all points with no opportunity to makeup the missed work including exams. Only excused absences as defined by having a doctor's note, death certificate, jury or military duty, will not be penalized and the determination will be on a case-by-case basis. Due to the difficulty in providing makeup exams if a student with an excused absence misses an exam, the grade will be dropped from the student's point calculations. Minor assignments will not be made up and forfeited points will only be considered at the end of the semester if the student has a borderline grade (2%). If the student's overall performance (participates the majority of the time) is satisfactory the student will be assigned the higher grade. In addition, ample extra credit is provided to compensate for occasional missed minor assignments.

4. **Laboratory Reports and Assignments:** You will use the laboratory notebook, TopHat, Microsoft Teams, and Canvas as directed. You are expected to come to in person labs every week and they count as part of attendance. Each lab will be worth a total of 10 points which is made up of doing the lab, pre-lab and post-lab assignments. **Your total lab grade is worth as much as a test grade, 100 points. You must turn all assignments in on time! Deadlines will NOT be extended for any student. No exceptions!** Prelabs will be due the night before the lab being performed and post labs will be due the night before the new lab begins. Thus every week except the first and last you will be finishing a post lab and beginning a prelab before the next lab class. You will also have 2 lab practicals worth 45 points each.
5. **Canvas:** This is the platform where you will access your class and download class materials. PowerPoint slides, assignments, alerts, and other materials will be posted here. You will also access your Mastering Biology homework through Canvas as well as your labs. There is **NO COURSE CODE** used for mastering biology please follow the provided instructions on Canvas.
6. **Homework:** You will be assigned homework throughout the semester. The homework is worth **almost as much as a test grade**. Homework is assigned online using Pearson's online adaptive learning software known as **MasteringBiology**. If you have purchased a new copy of the textbook you will find an access code for MasteringBiology bundled with the book. If you have purchased a used book or have a version other than the Valencia custom edition that costs a fortune, you will need to purchase a subscription to MasteringBiology through the portal found in the Canvas page for this class.

Repetition, repetition, repetition! The more you practice the better you will score! You will be given unlimited attempts at the homework until it is due. Homework is due Sunday at 11:59PM every week unless otherwise noted.

7. **Discussions:** Students are required to make discussion posts weekly due Sunday at 11:59PM and initial posts are recommended to be completed the Wednesday before the deadline so other students can reply before the deadline. These assignments are found on Canvas but the discussions themselves are held in the Microsoft Teams app. For most assignments, students are expected to reply to 2 other students with meaningful feedback as instructed. This is intended to be a discussion, not a monologue. **Students who agree with another student but this fact is wrong will forfeit points for the assignment as it demonstrates a failure to do the research.** Disagreement with a wrong answer is highly encouraged. The purpose of the discussions are to facilitate active learning, research skills, and social learning. Feel free to express yourself with emojis, likes, gifs, photos etc. as long as they are classroom appropriate.
8. **Exams:** All exams will be based on both the lecture material and assigned reading. There will be five 60 minute, exams and one final comprehensive exam. All exams are multiple choice (including matching and true and false questions) and will be administered via Canvas. You will be required to use HonorLock in order to take exams. **Only you may take your exam and no one may help you or this is considered cheating. Cheating on an exam will result in a 0 grade! Pay attention to deadlines. No student may take an exam after the deadline has passed. Failure to take an exam is a 0 on that exam there are no makeups due to the flexibility of the exam times.**

The college has adopted the Honorlock application as the remote proctoring application for online examinations this summer. This is an extension for the Chrome browser and is required to access the exams in Canvas, along with a webcam and microphone. **You will be remotely monitored and recorded while taking the exam, including your internet activity, attempted use of other devices and interactions with other people at your location. Canvas will also keep a record of your internet activity, including during the exam.** Any clearly identified evidence of cheating on an exam will result in a zero for the exam. A second incidence will result in you being administratively dropped from the class. **You will be required to sign an academic honesty agreement, and this must be on file with me prior to the first exam.**

**Please Note: If, for any reason, HonorLock is not available for an exam, report it immediately to HonorLock tech support and your instructor.**

Learn more about Honorlock by clicking on the following link: <https://honorlock.com/students/>

**NOTE: Students must use a computer with reliable internet access because excuses or failure to complete assessments due to computer error will not be permitted. Use your local library or Valencia campus if you can not get a working computer/internet at home! Your computer is not the only one in existence!**

9. **Extra Credit:** There are several ways to earn extra credit in this class. Students have the opportunity to receive at least an additional 40 points. The professor has the right to add additional extra credit opportunities throughout the semester.

**Create biological art presentation (20 pts) 2%:** Students will be given the opportunity to earn extra credit by creating a term project. The assignment will be given about half way through the course and will be due the last week of class (Date to be specified). Students will identify a biology topic of interest and create a biological work of art. This includes drawings, paintings, dioramas, ceramics, poems, food art or other artistic medium. The intended project needs to be approved by the professor and the student should submit a brief description of the intended work to the professor before beginning the project. Each student must work **individually** and the project must include at least 10 relevant vocabulary words from the chosen topic. Students will be graded based on biological relevance. A completed project is worth 20 points (= 2% points). Students will record themselves presenting their project and upload it to Canvas to receive credit.

**Covid-19 Assignment (20 pts) 2%:** Students will research answers to questions related to Covid-19. Students must create a works cited page properly and demonstrate reading comprehension of scientific materials. Students must put answers in their own words and avoid plagiarism practices. Students will be graded for accuracy.

**10. Grading:** Grades will be posted on Canvas. There will be a total of 1000 points available for the semester. These will be allocated as follows:

- a. 500 points from lecture exams (4 x 500 points =500 points)
- b. 100 points from the final exam
- c. 90 points for homework (5 pts per assignment x 16 + 10 for final HW = 90)
- d. 100 points for the lab assignments (10 pts each lab x 12)
- e. 90 points for lab practicals (2 x 45 points = 90 points)
- f. 40 points for attendance quiz (16 chapters)
- g. 40 points for discussions (16 topics)
- h. 40 points for miscellaneous assignments
- i. Extra credit a total 40 pts for art project presentation and Covid-19 assignment

At the end of the semester, your score for each of these components will be added together and converted to a percentage. Grades for the semester will be awarded using the following scale:

- A:  $\geq 900$  ( $\geq 90\%$ )  
B: 800 - 899 pts (80%-89%)  
C: 700 - 799 pts (70%-79% )  
D: 600 - 699 pts (60%-69%)  
F:  $\leq 599$  ( $\leq 59\%$ )

Note: Curving is up to the professor's discretion based on overall class performance. The professor has the right to add additional extra credit opportunities throughout the semester. The professor has the right to make modifications to the syllabus in order to improve the student learning experience, student safety, integrity etc.

**11. Withdrawal:** You are responsible for initiating a voluntary withdrawal from the class prior to the published withdrawal date. **You must withdraw prior to the withdrawal date in order to avoid being given an “F” grade. After the official withdrawal date, you cannot withdraw from the course and your grade will be what you have earned. The professor does not withdraw any student with these notable exceptions: as a no-show during the no-show period per Valencia policy, if a student violates the netiquette as described below or is deemed to be a threat to another student, faculty, staff, or themselves, the student is absent from class either in person or online for 4 consecutive weeks without notifying the professor prior to the withdrawal deadline.** Any student who withdraws from a class during a third or subsequent attempt in the same course will be assigned a grade of “F”. For a complete policy and procedure overview on Valencia policy 4-07 (Academic Progress, Course Attendance and Grades, and Withdrawals) please go to:

<https://catalog.valenciacollege.edu/academicpoliciesprocedures/courseattempts/coursewithdrawal/>

**12. Academic Dishonesty:** All forms of academic dishonesty are prohibited at Valencia College. Academic dishonesty includes, but is not limited to, plagiarism, cheating, furnishing false information, forgery, alteration or misuse of documents, misconduct during a test situation, and misuse of identification with intent to defraud or deceive.

**All work submitted by students is expected to be the result of the student’s individual thoughts, research and self-expression. Whenever a student uses ideas, wording or organization from another source without citing that source (expected for research assignments), this is considered plagiarism! A violation of Academic Dishonesty will result in an 0 for the assignment and an F for the entire course for a second violation!**

Students shall take special notice that the assignment of course grades is the responsibility of the student’s individual professor. When the professor has reason to believe that an act of academic

dishonesty has occurred, and before sanctions are imposed, the student shall be given informal notice and an opportunity to be heard by the professor. Any student determined by the professor to have been guilty of engaging in an act of academic dishonesty shall be liable to a range of academic penalties as determined by the professor which will include, but not be limited to, one or more of the following: loss of credit for an assignment, examination or project; a reduction in the course grade; or a grade of “F” in the course. At the option of the professor, the campus president may be furnished with written notification of the occurrence and the action taken. If such written notice is given, a copy shall be provided to the student.

Students guilty of engaging in a gross or flagrant act of academic dishonesty or repeated instances of academic dishonesty shall also be subject to administrative and/or disciplinary penalties which may include warning, probation, suspension and/or expulsion from the college.

13. **Valencia Online tutoring system will be coming out soon. Please check announcements and e-mail for updates.**
14. **Smarthinking Online Tutoring:** Smarthinking is a free online tutoring service, where you can receive live, online tutoring as well as submit your essays for comments. To access this resource, log into Atlas, click on the “Courses” tab, and click on “Tutoring (online) – Smart Thinking,” located under “My Courses.”
15. **BayCare Services:** BayCare is a private and confidential counseling service contracted by Valencia College that provides short-term assistance to credit students who need to resolve problems that are affecting their college performance. Examples might include stress, relationship/family issues, alcohol/drug problems, eating disorders, depression, and gender issues. If you are experiencing any of these issues, call 1-800-878-5470 to speak to a professional counselor. For more information, log into Atlas, click on the “Students” tab, and click on “BayCare Health System,” located under “Health and Wellness.”
16. **Students with Disabilities:** Students with disabilities who qualify for academic accommodations **must provide a letter** from the Office for Students with Disabilities (OSD) and discuss specific needs with the professor, preferably during the first two weeks of the semester. The OSD (West Campus SSB 102, ext. 1523) determines accommodations based on appropriate documentation of disabilities.
17. **Classroom Etiquette “Netiquette”:** We expect students to respect all students and their opinions, even those they may not agree with, in our virtual classrooms. Name calling, shaming or otherwise demeaning comments towards students will not be tolerated. If you violate the rules you will first be asked to stop. **If you continuously disrespect other students the professor has the right to withdraw you from the class!**
18. **Learning Objectives:** You are responsible for learning the material as outlined in the learning objectives of this course (attached)

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## Exam Schedule

- Exam 1: Chapters 1-5
- Exam 2: Chapters 6-7
- Exam 3: Chapters 8-10
- Exam 4: Chapters 12-15
- Exam 5: Chapters 16-17
- Final: Cumulative

### Tentative Course Schedule:

(NOTE: This is a tentative schedule and the instructor reserves the right to change this schedule without notice but will do the best to stay on schedule)

Please read the assigned chapters listed below before coming to class. The instructor assumes that you have done so.

<b>Week Beginning</b>	<b>Lecture (online)</b>	<b>Lab in person building 8-219 on Fridays</b>
1 Aug 21	Chapter 1 (Introduction to Biology)	Lab 1 Lab Safety and Scientific Method and Design and Measurement
2 Aug 28	Chapters 2 and 3 (Chemical context of life and Water)	Lab 2 Gel Electrophoresis and pH
3 Sep 4	Chapter 4 (Carbon structures and functional groups)	<b>Class meets online</b>
4 Sep 11	Chapter 5 (Macromolecules) ( <b>exam 1 due the following Sunday</b> )	Lab 3 Chemical Composition of Cells
5 Sep 18	Chapter 6 (Eukaryotic Cells)	Lab 4 Microscope and Cell Observation
6 Sep 25	Chapter 7 (cell structure and membrane function) ( <b>exam 2 due the following Sunday</b> )	Lab 5 Membranes and Molecule Transport
7 Oct 2	Chapter 8 (Intro to Metabolism)	<b>Lab Practical (Oct 6<sup>th</sup>) Online</b>
8 Oct 9	Chapter 9 (Respiration)	Lab 6 Enzymes
9 Oct 16	Chapter 10 (Photosynthesis) ( <b>exam 3 due the following Sunday</b> )	Lab 7 Cellular Respiration and Photosynthesis
10 Oct 23	Chapter 12 (Cell Cycle and Mitosis) and 13 (Mitosis and Meiosis)	Lab 8 Fermentation
11 Oct 30	Chapter 14 (Mendelian Genetics)	Lab 9 Gene Mutation Part I and Crime Scene Investigation (CSI)
12 Nov 6	<b>Chapter 15 (Chromosomal Inheritance) (exam 4 due the following Sunday)</b>	<b>No class – Veterans Day</b>
13 Nov 13	Chapter 16 (DNA Replication)	Lab 10 Mitosis and Gene Mutation Part II
14 Nov 20	<b>Thanksgiving Break- No Class</b>	
15 Nov 27	Chapter 17 (Transcription and Translation) ( <b>exam 5 due the following Sunday</b> )	<b>Lab Practical Final (Nov 29<sup>th</sup>) Online</b>
16 Dec 4	<b>Dec 6<sup>th</sup> Final exam due</b>	

### Vacations and other important dates:

- Sep 4<sup>th</sup> – Labor Day
  - Aug 28<sup>th</sup> – Drop/Refund Deadline (This is the last day to get your money back) 11:59PM
  - **Oct 27<sup>th</sup> – Withdrawal deadline 11:59PM**
  - Nov 10<sup>th</sup> – Veterans Day – No Class
  - Nov 22<sup>nd</sup> – Nov 26<sup>th</sup> Thanksgiving Break - college closed
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**Students on financial aid should consult an advisor or counselor before withdrawing from a course; there may be financial implications to the student which he or she must know about to make an informed decision before withdrawing from a course. Students with some scholarships who withdraw or are withdrawn from a class must pay the college for the cost of the class. Other scholarship sponsors may also require repayment.**

**In order to academically maintain financial aid, students must meet all of the following requirements:**

- **Complete 67% of all classes attempted, and**
- **Maintain a Valencia GPA of 2.0 or higher, and**
- **Maintain an overall GPA of 2.0 or higher, and**
- **Complete degree within the 150% timeframe**

Detailed information about maintaining satisfactory academic progress (SAP) can be found at:

<https://catalog.valenciacollege.edu/financialaid/satisfactoryacademicprogress/>

#### **Course Attempts/Course Withdrawal**

Agencies and organizations which provide financial assistance/scholarships (federal and state government, businesses, etc.) may have requirements relative to withdrawal, course repeats and grade forgiveness which are more stringent than those described below. It is your responsibility to verify the effects of enrollment and/or withdrawal upon your financial assistance (financial aid, scholarships, grants, etc.).

According to State Rule 6A-14.0301, you may attempt the same course only three times at Valencia including the original grade, repeat grades and withdrawals at any point in the term. Students in Bachelor's degree programs are limited to two attempts. The same course usually means the subject prefix and course number are the same when posted on a Valencia transcript. Courses that have been deemed equivalent will all count as attempts even if the current course number is not the same as your previous attempt(s). Being enrolled in a course for credit beyond the Drop/Refund Deadline counts as an attempt. The Drop/Refund Deadline for each term is listed in the Academic Calendar in the online official catalog.

#### **Notice to Students Seeking to Withdraw from a Course(s)**

Before you withdraw from a course, you should be aware that course withdrawals:

- Will increase the cost of your education
- May affect your financial aid status
- May affect your transfer grade point average

- May result in your having to pay the full cost of instruction fee to retake the course
- May affect your anticipated graduation date
- May result in your being denied access to limited access programs
- May affect your eligibility for the Honors Program
- May affect your immigration status if you are attending Valencia on a nonimmigrant visa
- Will result in your required repayment of course fees paid by a Bright Futures scholarship.

To withdraw from a course(s) you must access registration on Atlas. The Withdrawal Deadlines for each term are published in the Academic Calendar in the online official catalog. All requests for withdrawals must be submitted by 11:59 p.m. on the Withdrawal Deadline date.

**Before you**

**withdraw:**

- Talk with your professor to discuss your progress in the course
- See a Student Services staff member to discuss how a withdrawal will affect your career and education plans and/or the status of your financial aid

**Conditions That Apply to a First or Second Attempt in a Course**

On or Before the Withdrawal Deadline:

During a first or second attempt in the same course at Valencia, if you withdraw, or are withdrawn by the professor, you will receive a W (Withdrawn). You will not receive credit for the course, and the W will not be calculated in your grade point average; however, the enrollment will count in your total attempts in the specific course.

Following withdrawal, you may, with the professor's approval, continue to attend the course for the remainder of the term.

After the Withdrawal

Deadline:

A student is not permitted to withdraw after the withdrawal deadline. A professor may withdraw you up to the beginning of the final exam period for violation of the class attendance policy, as published in the faculty member's syllabus, in which case you will receive a grade of "W". If the professor does not withdraw you, your grade will be what you had earned.

For a complete policy and procedure overview on Valencia Policy please go to:

<http://valenciacollege.edu/generalcounsel>

## **Learning Objectives for Chapter 1**

1. Briefly describe the unifying themes that characterize the biological sciences.
2. Distinguish among the three domains of life, and the eukaryotic kingdoms
3. Distinguish between the following pairs of terms: discovery science and hypothesis-based science, quantitative and qualitative data, inductive and deductive reasoning, science and technology

Must also include, but not limited to:

The scientific process, control group vs. experimental group, inductive vs. deductive reasoning, forming and testing hypotheses, the hypothesis - prediction method, quantitative vs. qualitative data, reading a graph, dependent vs. independent variables

## **Learning Objective for Chapter 2**

1. Identify the four elements that make up 96% of living matter.
2. Distinguish between the following pairs of terms: neutron and proton, atomic number and mass number, atomic weight and mass number
3. Distinguish between and discuss the biological importance of the following: nonpolar covalent bonds, polar covalent bonds, ionic bonds, hydrogen bonds, and van der Waals interactions

Must also include, but not limited to:

Matter, elements, atoms, subatomic particles, atomic number and mass, electron distribution and chemical properties, isotopes, valence electrons, compounds, types of molecular bonds and interactions, polar vs. nonpolar covalent bonds and molecules, ions and ionic bonds, salts and ionic substances

## **Learning Objectives for Chapter 3**

1. List and explain the four properties of water that emerge as a result of its ability to form hydrogen bonds
2. Distinguish between the following sets of terms: hydrophobic and hydrophilic substances; a solute, a solvent, and a solution
3. Define acid, base, and pH
4. Explain how buffers work

Must also include, but not limited to:

The properties of water, hydrophilic, vs. hydrophobic, hydrocarbon solubility in water, acids vs. bases (alkaline), the pH scale, buffers

## **Learning Objectives for Chapter 4**

1. Explain how carbon's electron configuration accounts for its ability to form large, complex, and diverse organic molecules.
2. Describe how carbon skeletons may vary, and explain how this variation contributes to the diversity and complexity of organic molecules.
3. Describe the basic structure of a hydrocarbon and explain why these molecules are hydrophobic.
4. Distinguish among the three types of isomers: structural, geometric, and enantiomer.
5. Name the major functional groups found in organic molecules. Describe the basic structure of each functional group and outline the chemical properties of the organic molecules in which they occur.

## **Learning Objectives for Chapter 5**

1. List the four major classes of macromolecules.
2. Distinguish between monomers and polymers.
3. Draw diagrams to illustrate condensation and hydrolysis reactions.
4. Distinguish between monosaccharides, disaccharides, and polysaccharides.
5. Describe the formation of a glycosidic linkage and distinguish between the glycosidic linkages found in starch and cellulose.
6. Distinguish between saturated and unsaturated fats.
7. Distinguish between a protein and a polypeptide.
8. Explain how a peptide bond forms between two amino acids.
9. Describe the four levels of protein structure
10. Explain what determines protein conformation and why it is important.
11. List four conditions under which proteins may be denatured.
12. List the major components of a nucleotide, and describe how these monomers are linked to form a nucleic acid.
13. Briefly describe the three-dimensional structure of DNA.

## **Learning Objectives for Chapter 6**

1. What features are found in common in both prokaryotic and eukaryotic cells?
2. Create a table to compare a typical plant cell and a typical animal cell. In one column list those organelles that are common to both cell types then, in separate columns, list the organelles that are unique to each cell type.
3. Describe the structure of the nucleus and its function.
4. Differentiate between the two types of ribosomes found in eukaryotic cells.
5. Identify the components of the endomembrane system and describe the structure and function of each. Trace the path of protein that is secreted from a cell from its synthesis by a ribosome to its release from the cell.
6. Briefly describe the structure and function of the mitochondrion, chloroplast and peroxisome.
7. Briefly explain the origin of mitochondria and chloroplasts using the endosymbiotic theory
  
8. Identify the three components of the cytoskeleton and give examples of the cellular structures that are created using these components.
9. Briefly describe the extracellular environment of a plant cell and an animal cell.
10. Cells in plants and animals interact and communicate with each other. Describe the features of plant cells and animal cells that aid in these activities.

## **Learning Objectives for Chapter 7**

1. Define the following terms: amphipathic molecules, aquaporins, diffusion
2. Distinguish between the following pairs or sets of terms: peripheral and integral membrane proteins; channel and carrier proteins; osmosis, facilitated diffusion, and active transport; hypertonic, hypotonic, and isotonic solutions
3. Explain how transport proteins facilitate diffusion
4. Explain how an electrogenic pump creates voltage across a membrane, and name two electrogenic pumps
5. Explain how large molecules are transported across a cell membrane

Must also include, but not limited to:

The structure and function of plasma membranes, the selective permeability of plasma membranes, the amphipathic nature of phospholipids, the types of cellular transport across membranes, effects of tonicity on cells of different types.

## **Learning Objectives for Chapter 8**

1. Distinguish between the following pairs of terms: catabolic and anabolic pathways; kinetic and potential energy; open and closed systems; exergonic and endergonic reactions.
2. Explain the second law of thermodynamics and explain why it is not violated by living organisms.
3. Explain in general terms how cells obtain the energy to do cellular work.
4. Explain how ATP performs cellular work.
5. Describe the function of enzymes in biological systems.
6. Explain why an investment of activation energy is necessary to initiate a spontaneous reaction.
7. Describe the mechanisms by which enzymes lower activation energy.
8. Describe how allosteric regulators may inhibit or stimulate the activity of an enzyme.

Must also include, but not limited to:

Metabolism, catabolic vs. anabolic pathways, forms of energy, the laws of thermodynamics, the structure, hydrolysis and regeneration of ATP, enzyme structure and function, effects of local conditions on enzyme activity, regulation of enzyme activity, endergonic vs. exergonic reactions, energy of activation, cofactors, the models of enzyme activity

## **Learning Objectives for Chapter 9**

1. Define oxidation and reduction, and, in general terms, explain how redox reactions are involved in energy exchanges.
2. Name the three stages of cellular respiration and state the region of the eukaryotic cell where each stage occurs.
3. In general terms, explain the role of the electron transport chain in cellular respiration.
4. Explain where and how the respiratory electron transport chain creates a proton gradient.
5. Distinguish between fermentation and anaerobic respiration.

Must also include, but not limited to:

The importance and purpose of cellular respiration, the location of and molecules involved with each stage of cellular respiration, redox reactions, the accounting of ATP production by cellular respiration, ATP synthase, fermentation and anaerobic respiration

## **Learning Objectives for Chapter 10**

1. Describe the structure of a chloroplast, listing all membranes and compartments.
2. Write the chemically correct summary equation for photosynthesis, and, in general terms, explain the role of redox reactions in photosynthesis.
3. Describe the relationship between an action spectrum and an absorption spectrum.
4. Trace the movement of electrons in noncyclic and cyclic electron flow.
5. Describe the similarities and differences in chemiosmosis between oxidative phosphorylation in mitochondria and photophosphorylation in chloroplasts.
6. Describe the major consequences of photorespiration.
7. Describe two important photosynthetic adaptations that minimize photorespiration.

Must also include, but not limited to:

The importance and purpose of photosynthesis, the location of and molecules involved with each stage of photosynthesis, autotrophs vs. heterotrophs, the sites of photosynthesis in plants, redox reactions, the nature of sunlight, photosynthetic pigments, the light reactions, the Calvin cycle, cyclic and linear electron flow, photorespiration, the differences between C<sub>3</sub>, C<sub>4</sub>, and CAM plants

## **Learning Objectives for Chapter 12**

1. Describe the structural organization of a prokaryotic and eukaryotic genome.
2. Describe the major events of cell division that enable the genome of one cell to be passed on to two daughter cells.
3. List the phases of the cell cycle and describe the sequence of events that occurs during each phase.
4. List the phases of mitosis and describe the events characteristic of each phase.
5. Compare cytokinesis in animals and plants.
6. Explain how the abnormal cell division of cancerous cells escapes normal cell cycle controls.
7. Distinguish between benign, malignant, and metastatic tumors.

Must also include, but not limited to:

Binary fission, the cell cycle and its phases, the functions of cell division, the cellular organization of genetic material, the distribution of chromosomes during eukaryotic cell division, the differences between plant and animal cell division, the mitotic spindle

## **Learning Objectives for Chapter 13**

1. Distinguish between the following terms: somatic cell and gamete; autosome and sex chromosomes; haploid and diploid.
2. List the phases of meiosis I and meiosis II and describe the events characteristic of each phase.
3. Describe three events that occur during meiosis I but not during mitosis.
4. Explain how independent assortment, crossing over, and random fertilization contribute to genetic variation in sexually reproducing organisms.

Must also include, but not limited to:

Evaluate sexual vs. asexual reproduction as they relate to genetic variation, fertilization, zygotes, the stages and purpose of meiosis, the law of independent assortment, crossing over, chromosome numbers gametes and somatic cells, haploid vs. diploid cells, homologous chromosomes, compare mitosis to meiosis

## **Learning Objectives for Chapter 14**

1. Define the following terms: true-breeding, hybridization, monohybrid cross, P generation, F<sub>1</sub> generation, and F<sub>2</sub> generation.
2. Distinguish between the following pairs of terms: dominant and recessive; heterozygous and homozygous; genotype and phenotype
3. Use a Punnett square to predict the results of a cross, stating the phenotypic and genotypic ratios of the F<sub>2</sub> generation.
4. Explain how Mendel's laws of inheritance can be explained by the behavior of chromosomes during meiosis.
5. Use the laws of probability to predict the probability of specific phenotypes in F<sub>2</sub> generations of multi-character crosses without the use of Punnett squares (eg. 3, 4 and 5 character crosses).
6. Explain how phenotypic expression in the heterozygote differs with complete dominance, incomplete dominance, and codominance.
7. Define and give examples of pleiotropy and epistasis.
8. Explain why lethal dominant genes are much rarer than lethal recessive genes.
9. Explain how carrier recognition, fetal testing, and newborn screening can be used in genetic screening and counseling.

## **Learning Objectives for Chapter 15**

1. Explain the chromosomal theory of inheritance and its discovery.
2. Explain why sex-linked diseases are more common in human males than females.
3. Distinguish between sex-linked genes and linked genes.
4. Explain how meiosis accounts for recombinant phenotypes.
5. Explain how linkage maps are constructed.
6. Explain how nondisjunction can lead to aneuploidy.
7. Define trisomy, triploidy, and polyploidy.
8. Distinguish among deletions, duplications, inversions, and translocations.
9. Explain genomic imprinting.
10. Explain why extranuclear genes are not inherited in a Mendelian fashion.

## **Learning Objectives for Chapter 16**

1. Describe the contributions of the following people: Griffith; Avery, McCarty, and MacLeod; Hershey and Chase; Chargaff; Watson and Crick; Franklin; Meselson and Stahl.
2. Describe the structure of DNA.
3. Describe the process of DNA replication; include the following terms: antiparallel structure, DNA polymerase, leading strand, lagging strand, Okazaki fragments, DNA ligase, primer, primase, helicase, topoisomerase, single-strand binding proteins.
4. Describe the function of telomeres.

## **Learning Objectives for Chapter 17**

1. Describe the contributions made by Garrod, Beadle, and Tatum to our understanding of the relationship between genes and enzymes.
2. Briefly explain how information flows from gene to protein.
3. Compare transcription and translation in bacteria and eukaryotes.
4. Explain what it means to say that the genetic code is redundant and unambiguous.
5. Describe transcription using the following terms: mRNA, RNA polymerase, the promoter, the terminator, the transcription unit, initiation, elongation, termination, and introns.
6. Describe translation using the following terms: tRNA, wobble, ribosomes, initiation, elongation, and termination.
7. Briefly describe the effect of mutations using the following terms: point mutations – both substitution and insertion/deletion mutations – and frameshift mutations, and how they contribute to genetically inherited disorders with particular reference to sickle cell anemia.



## **Guidelines for Effective Study and Exam Preparation according to Dr. Lindbeck**

The most common barrier to success encountered by college students is a lack of effective techniques for study and exam preparation. If you are one of the vast majority of students whose answer to the question, "How do you study for your tests?" is, "I go over my notes," or "I read the text book", then you need to take a serious look at your study skills. Here are some suggestions to increase your effectiveness as a student.

### **I. Day to Day**

**A.** Take good notes. Very few students leave high school with this skill. The Student Success class can help you learn how to do this. Here are some suggestions and observations.

1. Always take the notes for a particular class in the same notebook. Spiral bound notebooks were invented because they solved the problem of keeping related information consolidated in one place. Take advantage of this.
2. Date each entry into your notebook.
3. It is usually best to keep the notes for different classes separate from each other. Spiral notebooks with built in dividers are excellent for this purpose.
4. Your notes should contain as complete a record of what the instructor said as possible. Of course, you should not try to write every word spoken, but don't leave out ideas. When you study, your notes should call back to your mind the entire sequence of ideas presented. Take care to spell all new words carefully.
5. Anything the instructor writes on the board should appear in your notes. If the instructor took the time to write it out, he or she considers it important. You should do the same.
6. If possible, try to take your notes in some kind of outline form. The organization of ideas is as important as the content of those ideas, especially when it comes to learning the material for an exam.
7. You might find it useful to have a second color of pen or pencil available for highlighting important ideas or indicating vocabulary.

**B.** Be involved in your classes. Don't simply pretend you are a sponge, ready to soak up whatever the instructor says. You are there to learn, not to be taught.

1. If the instructor is moving too rapidly for you, or if you don't understand what is being said, say something!
2. Ask questions if you are confused. Confusion is definitely your worst enemy.
3. If your class includes group activities, participate as fully as you can. Such exercises are done for your benefit, not to provide a break for the instructor.

**C.** Review your notes every day. This suggestion is one that we have all heard a thousand times. Unfortunately, most of us never really believe it until we actually try it. Spend 30 minutes or so each evening going over the notes from each class. There are at least two tremendous benefits to be gained from this discipline.

1. Research has shown that reviewing new material within 24 hours of hearing it increases your retention of that material by about 60%. This means that you will be 60% ahead of the game the next time you walk into class. If you want to significantly reduce the time necessary to prepare for exams, this is the way to do it.

2. Reviewing material before the next class period enables you to identify points of confusion or omission in your notes, which prepares you to ask the questions you need to ask before the next lecture. Again, confusion is your worst enemy.

**D.** It is excellent policy to give high priority to new vocabulary. Language is the most fundamental tool of any subject, and it can seriously handicap you to fall behind in this.

**E.** Keep up on your reading. Unlike most high school teachers, many college instructors don't give specific reading assignments. You are expected to go to your text for the reading related to the materials covered in class. Be independent enough to do this without being told.

## **II. Using Your Textbook**

**A.** Don't expect your instructor to give you detailed, page by page textbook assignments. While some may do so, many do not. College teachers are much more likely to expect you to use your own initiative in making use of the text.

**B.** In most cases, it will be most useful for you to at least skim the relevant chapters before each lecture. You should receive a course outline/syllabus at the beginning of the semester, which will tell you the subject for each day. You may receive chapter references (or even page references), or your instructor may expect you to be perceptive enough to refer to the Table of Contents.

1. When you first approach a chapter, page through it fairly quickly, noting boldface headings and subheadings, examining figures, illustrations, charts, etc., and thinking about any highlighted vocabulary terms and concepts. Also take note of the pedagogical aids at the end of the chapter--study questions, summary, etc.
2. When you have finished surveying the chapter, return to the beginning and read in more detail. Remember to concentrate upon understanding. Don't simply read through the words. Any words that you don't understand you should look up. If you own the book and intend to keep it, you may want to write definitions of such words in the margins. You may also find it helpful to make observations and other useful notes in the margins. If you don't intend to keep the book yourself, you should carry out similar activities on a page in your class notebook.
3. On this first trip through the chapter, you should concentrate upon catching the major subjects and points of the material. Also take note of those things that you don't understand. If the lecture on the material doesn't clarify those points, you should ask your instructor to explain.

**C.** Following coverage of the chapter's material in class, you should go back to the book and read it again. It will probably be helpful to skim through it first, as you did when you first looked at it. The tables and figures should be more readily read in detail. If you are a truly conscientious student, you will outline the chapter and prepare a vocabulary list of the terms that are pertinent.

**D.** At this time you should think seriously about the review and study questions at the end of the chapter. Do your best to answer all of them as if they were a take-home exam.

**E.** You may also want to develop a system of cross-referencing symbols to use when comparing your class notes to your notes from the text.

**F.** Remember that your instructor will probably not use the same words that you find in the textbook. Nothing is more frustrating than to discover that what you hear in class is no more than a rehash of what you read in the book. However, if your instructor knows his/her subject, and the author of your text knows his/her subject, the meat of what they say should be the same. NOTE: Nobody is infallible. Your instructor may make mistakes. Don't expect him or her to be more than human.

## **III. Preparing Assignments**

**A.** Here's another thing we have all been told thousands of times: Don't leave assignments until the day before they are due! If you have a paper to write or a lab report to prepare, begin it as soon as possible. In most cases, instructors will be delighted to receive work early. Remember that many papers or projects

require quite a bit of research before you can even begin writing. In most cases, it is impossible to accomplish the necessary preparation in one day or even one week. In some cases, instructors won't accept late work at all. They are perfectly justified.

**B.** Another sore point: Be aware of the appearance of the work you submit. You should want to be proud of every assignment you submit, and that includes being proud of its appearance. If possible, assignments should always be typed. Never turn in an assignment written in pencil. Pages torn out of notebooks are sloppy and unsightly. Think about this point every time you hand an instructor an assignment. That paper represents the quality of your work, and your instructor is perfectly justified in taking its appearance into consideration when assigning a grade.

**C.** An increasing number of instructors are requiring that all outside work be typed. If you don't type, you should consider learning how. If you don't want to do this, you should begin investigating ways and means of getting someone else to type your papers. This will often mean paying a professional typist. Costs vary, but be prepared to pay a considerable amount. A really good typist may be able to turn out 6-10 pages an hour. Think about what you consider an appropriate hourly wage when you consider how much you should expect to pay a typist. Another point you must consider is that it will add to the time necessary to prepare a paper if you have to go to someone else to type it. In planning the time necessary for typing, consider the following points:

1. Your typist may have other customers who are just as anxious as you are.
2. A paper takes time to type.
3. Even the best typist makes mistakes. Your paper must be carefully proofread by you.
4. After proofreading, the typist must have time to make the necessary corrections.

**D.** If you prepare your assignment using a word processor, make sure that you run the spell checker/grammar checker before printing the final copy of your assignment. There is no excuse for poor spelling and/or grammar if you are using a word processor.

**E.** If you have never written an assignment or class paper before, or if you are unsure of your writing skills, the Communications Support Center (located in building 5-261) can give you assistance.

#### **IV. Preparing for Exams**

**A.** Keep in mind that you want to be an active learner, not a passive one. The more you use and manipulate the information, the better you will understand it. Using and manipulating information in as many ways as possible also maximizes your ability to access your memory.

**B.** Do not wait until the night before an exam to study! Of course, you should be regularly reviewing your notes, but the preparation still takes time.

**C.** If your instructor hasn't explained to you how he or she designs exams, ask. This is a perfectly legitimate concern. However, keep in mind that an instructor has the right to design exams in whatever fashion he or she sees fit, and in most cases you have no business asking for changes in that design. You need to learn to handle all testing styles--including the dreaded essay exam!

**D.** A good first step in preparation is to read through your notes a couple of times. While you are doing this, you might also:

1. Highlight major topics and subtopics, with the goal of generating an outline of your notes. Even if you take your notes in outline form, this is a good practice. Major topics often extend through more than one day's lecture, and it is easy to lose track of the overall picture from day to day.
2. With a second color, highlight all vocabulary terms.

**E.** Outline the entire set of notes. When you study a large body of information, you should study from concept to detail, not the other way around. It will, in fact, be much easier to learn the details if you take the time to learn the concept and theory first. The least efficient approach to studying is to attempt to memorize your notes from beginning to end. It's not the words that are important--it's the ideas.

**F.** Consider ways of dealing with the information other than those used in class. The more ways you can manipulate and experience the material you are trying to learn, the more secure your understanding and memory will be. Some suggestions:

1. Make charts, diagrams and graphs.
2. Make lists.
3. If the subject matter includes structures, practice drawing those structures. Remember that a drawing is useless unless the important structures are labeled.

**G.** There are almost always types of information that you will have to memorize (e.g. vocabulary). No one has ever invented a better device for memorizing than flash cards.

**H.** One of the most universally effective ways to polish off your study activities is to prepare a self-test.

1. Challenge yourself as severely as you can.
2. As you are studying, keep a running collection of "exam questions." If you seriously attempt to write difficult and meaningful questions, by the time you finish you will have created a formidable exam. When you begin to feel you're ready for your instructor's exam, take out your questions and see if you can answer them. If you can't, you may need to go back and reinforce some of the things you are trying to learn.

**I.** Never, ever pull an "All-Nighter" on the night before an exam. This is a "freshman trick," meaning that good students learn very quickly that it is futile. What you may gain from extra study time won't compensate for the loss of alertness and ability to concentrate due to lack of sleep.

**J.** On exam day:

1. Try not to "cram" during every spare moment before an exam. This only increases the feeling of desperation which leads to panic, and then to test anxiety. You may find it useful, on the night before an exam, to jot down a few ideas or facts which you wish to have fresh in your mind when you begin the exam. Read through your list a couple of times when you get up in the morning and/or just before you take the exam then put it away. This kind of memory reinforcement not only improves your performance on the test, it also improves your long-term memory of the material.
2. Be physically prepared.
  - a. Get a good night's sleep.
  - b. Bring necessary writing materials to the test--at least 2 writing tools, erasers, Scantrons, calculators if appropriate and allowed. Be aware of what the instructor has specified as permitted for use. Some instructors object to exams written pencil; some prohibit use of tools like calculators. It is your responsibility to know these requirements; you should be prepared to take the consequences if you don't.
  - c. This may seem silly, but go to the bathroom just before the exam. Don't expect your teacher to let you leave to do this during the test! The tension which generally goes along with taking an exam may increase the need to perform this physical activity, so you may need to go, even though you don't particularly feel like it.

## V. Some Final Suggestions

**A.** You should receive a syllabus for each class. This is the Rule Book for that. Know everything on that syllabus! Your teacher has the right to expect you to know and abide by any rules and stipulations on that document, and it is perfectly within his/her rights to penalize you for failing to do so. Respect dates and deadlines, and expect to lose points if you turn things in late.

**B.** Never miss an exam if you can help it. You will rarely be more ready for the exam in two or three days than you are on the scheduled date, and the annoyance the teacher will feel about having to arrange a special exam time for you can actually hurt your grade in the end. Miss exams only if you absolutely have to.

**C.** Save everything. Never throw away a handout or a returned assignment or exam. With this in mind, equip yourself with a pouched folder for each class.

**D.** Develop systematic behavior patterns associated with your schoolwork.

1. Keep your class materials together and neat.
2. Never allow yourself to be caught at school without the necessary notebooks and materials. If you develop systematic habits with respect to attending classes, etc., this will be no problem.

**E.** It is excellent practice to set aside a study area at home, and to designate a particular span of time each day as study time. However, don't fall into the trap of feeling that study should never exceed the preordained time limits. You put in as much study time as is necessary to master the material for your classes.

### Student Feedback on Instruction (SFI)

Each term students taking courses are asked to complete the electronic Student Feedback on Instruction survey to let us know more about their experiences. It is used at Valencia by faculty members to improve the teaching and learning experience. Faculty cannot access your student feedback until after final grades are posted. Through this link you can find answers to other commonly asked questions about the SFI.

<http://valenciacollege.edu/academic-affairs/institutional-effectiveness-planning/institutional-assessment/saicc/SFIFrequentlyAskedQuestions.cfm>

### BayCare Behavioral Health's Student Assistance Program

*"Valencia is committed to making sure all our students have a rewarding and successful college experience. To that purpose, Valencia students can get immediate help that may assist them with psychological issues dealing with stress, anxiety, depression, adjustment difficulties, substance abuse, time management as well as relationship problems dealing with school, home or work. Students have 24 hour unlimited access to the **BayCare Behavioral Health's confidential student assistance program** phone counseling services by calling **(800) 878-5470**. Three free confidential face-to-face counseling sessions are also available to students."*

Victim Service Center's Sexual Assault Hotline at 407-497-6701 or at <http://www.victimservicecenter.com/> .

## Weather Emergencies

In the case of weather emergencies, you can find out about school closings by signing up to update your information for Valencia Alerts.

### College Policies, Procedures and other References

- A full description of all College policies can be found in the College Catalog at <http://www.valenciacollege.edu/catalog/>
- Information about maintaining satisfactory academic progress can be found at [http://valenciacollege.edu/finaid/satisfactory\\_progress.cfm](http://valenciacollege.edu/finaid/satisfactory_progress.cfm)
- The Student Handbook can be found at <http://valenciacollege.edu/pdf/studenthandbook.pdf>
- The Policy Manual can be found at <http://valenciacollege.edu/generalcounsel>
- The college calendar can be found at <http://valenciacollege.edu/calendar>
- Information about the Office for Students with Disabilities can be found at <http://valenciacollege.edu/osd/CurrentStudents.cfm>
- Final exam schedule can be found at <http://valenciacollege.edu/calendar/FinalExam.cfm>
- Information about Valencia's Skillshop which offers a variety of topics on student success and goals can be found at <http://valenciacollege.edu/studentervices/skillshops.cfm>