Class Time:
Lecture  TTh  11:00 AM --12:20 PM  C326
Laboratory  TTh  8:50 AM --10:55 PM  S-300

Instructor  -  Carl E. Knight, Ph.D.
Office - C326
Office Hours –  MWF 8:00-9:00 AM C326
            TTH  8:00-9:00 AM C326
Office Phone - 972 860-7152
E-mail Address - carlknight@dcccd.edu

Course Description (4 Credit Hours): TCCNS: Microbiology for Science Majors 2014 Core Curriculum Foundational Component Area: 030 Life and Physical Sciences
Course Description: A study of the morphology, physiology, and taxonomy of representative groups of pathogenic and non-pathogenic organisms. Emphasis is placed on relationships that influence humans: public health, infectious diseases, and immunology, biotechnology, and environmental and industrial applications. Lab experimentation with pure cultures and selected media will be used to study extensively the medical, environmental, and industrial importance of these microbes. Designed for students in science or pre-professional programs. (3 Lec., 4 Lab.)

Coordinating Board Academic Approval Number 26.0503.51 03

Prerequisites: Biology 1406, Biology 1407 and Chemistry 1411. One of the following must be met: (1) Developmental Reading 0093 AND Developmental Writing 0093; (2) English as a Second Language (ESOL) 0044 AND 0054; or (3) have met Texas Success Initiative (TSI) in Reading and Writing standards AND DCCCD Writing score prerequisite requirement. Student cannot take both BIOL 2420 and BIOL 2421 to satisfy the core science credit.

Textbooks:
Required:
Core Objectives:
BIOL 2421 develops the following Core Objectives:

- **Critical Thinking** - to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information.
- **Communication** - to include effective development, interpretation and expression of ideas through written, oral and visual communication.
- **Empirical and Quantitative Skills** - to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions.
- **Teamwork** - to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal.

Core Objective Development Statements:
BIOL 2421 develops **Critical Thinking** and **Empirical and Quantitative Skills** by requiring students to research, analyze and interpret data derived from an experimental setting and drawing a well-informed conclusion of the data through the application of sound biological concepts.

Examples: research paper, case studies, lab report

BIOL 2421 develops **Teamwork** and **Communication** by requiring students to effectively work in a small group on an assigned problem, exercise or course concept that will then be presented in a written, oral or visual format.

Examples: lab experiment, group teaching of course topic, case study, group research project

Student Learning Outcomes:
Upon successful completion of this course, students will:

Lecture
1. Provide examples of the impact of microorganisms on agriculture, environment, ecosystem, energy, and human health, including biofilms.
2. Identify unique structures, capabilities, and genetic information flow of microorganisms.
3. Compare the life cycles and structures of different types of viruses.
4. Discuss how microscopy has revealed the structure and function of microorganisms.
5. Give examples of the range of metabolic diversity exhibited by microorganisms, impact of metabolic characteristics on growth, and control of growth.
6. Describe evidence for the evolution of cells, organelles, and major metabolic pathways from early prokaryotes and how phylogenetic trees reflect evolutionary relationships.
7. Describe the causes and consequences of mutations on microbial evolution and the generation of diversity as well as human impacts on adaptation.
8. Classify interactions of microorganisms on human and non-human hosts as neutral, detrimental, or beneficial.

Laboratory
1. Apply scientific reasoning to investigate questions and utilize scientific tools such as microscopes and laboratory equipment to collect and analyze data.
2. Use critical thinking and scientific problem-solving to make informed decisions in the laboratory.
3. Communicate effectively the results of scientific investigations.
4. Provide examples of the impact of microorganisms on agriculture, environment, ecosystem, energy, and human health, including biofilms.
5. Identify unique structures, capabilities, and genetic information flow of microorganisms.
6. Compare the life cycles and structures of different types of viruses.
7. Discuss how microscopy has revealed the structure and function of microorganisms.
8. Give examples of the range of metabolic diversity exhibited by microorganisms, impact of metabolic characteristics on growth, and control of growth.
9. Describe evidence for the evolution of cells, organelles, and major metabolic pathways from early prokaryotes and how phylogenetic trees reflect evolutionary relationships.
10. Describe the causes and consequences of mutations on microbial evolution and the generation of diversity as well as human impacts on adaptation.
11. Classify interactions of microorganisms on human and non-human hosts as neutral, detrimental, or beneficial.

Examinations:

4 Major lecture exams* – 100 points each = 400 points
3 Laboratory exams – 100 points each = 300 points
1 Laboratory report based on the identification of unknown bacteria – 150 points.
Instructor evaluation of student performance including attendance – 100 points.

1 case study – 100 points

*Make– up Exams
A comprehensive final will be given for lecture exam missed.
If a laboratory practical is missed, you will receive a grade of ZERO for the exam. There are no make-up laboratory practicals.

Faculty evaluation will be added and is based on overall evaluation of the instructor. The grade will not be lower than the grade received on the average of the other examinations.

Final grade:

<table>
<thead>
<tr>
<th>Points</th>
<th>Percentage</th>
<th>Grade</th>
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<tbody>
<tr>
<td>900–1000</td>
<td>90–100%</td>
<td>A</td>
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<tr>
<td>800–899</td>
<td>80–89%</td>
<td>B</td>
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<tr>
<td>700–799</td>
<td>70–79%</td>
<td>C</td>
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<td>600–699</td>
<td>60–69%</td>
<td>D</td>
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<tr>
<td>0–599</td>
<td>0–59%</td>
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</table>

Writing Across the Curriculum:
Science courses at Eastfield College follow a principle of “Writing Across the Curriculum.” Each course incorporates a writing element. Writing is a critical part of communication of ideas, and is important in the synthesis and analysis of scientific concepts. Writing in this course is accomplished through completion of research paper and case study. Each question must be answered in complete sentences, using proper grammar, correct spellings, giving examples and details to support the statement.

Obtaining Final Course Grades Using eConnect:
Final Grade Reports are no longer mailed. Convenient access is available online at www.econnect.dcccd.edu. Use your identification number when you log onto eConnect, an online system developed by the DCCCD to provide you with timely information regarding your college record. Your grades will also be printed on your Student Advising Report, which is available in the Admissions Office.
**Eastfield College Email Policy:** Faculty and students must have and use a DCCCD account for all correspondence relating to academic coursework. For information on setting up a DCCCD student email account go to: [http://www.dcccd.edu/netmail/home.html](http://www.dcccd.edu/netmail/home.html)

**Course Outline:**
1. Microbial Life: Origin and Discovery
2. Observing the Microbial Cell
3. Cell structure and Function
4. Metabolism and Biochemistry
5. Microbial Metabolism and biochemistry cont.
6. The Viruses
7. Microbial Diversity;
   a. Bacterial Diversity
   b. Archaeal Diversity
   c. Eukaryotic Diversity (Fungi)
   d. Eukaryotic Diversity (Algae, Protozoa)
   e. Microbial Ecology
8. Adaptive Immune response
9. Food and Industrial Microbiology
10. Microbial Diseases and Their Control

**SCANS SKILLS:**

**FOUNDATION SKILLS**

(F1) READING – locates, understands and interprets written information

(F2) WRITING – communicates thoughts, ideas, information in writing

(F3) ARITHMETIC – performs basic computations

(F4) MATHEMATICS – chooses appropriate mathematical techniques

(F5) LISTENING – receives, interprets, and responds to verbal messages and cues

(F6) SPEAKING – organizes ideas and communicates orally

(F7) CREATIVE THINKING – generates new ideas

(F8) DECISION MAKING – specifies goals and constraints, chooses best alternatives

(F9) PROBLEM SOLVING – recognizes problem and devises/implements a solution

(F10) MENTAL VERBALIZATION – thinking about what something will be

(F11) KNOWING HOW TO LEARN – uses efficient learning techniques

(F12) REASONING – discovers and applies underlying rules or principles

(F13) RESPONSIBILITY – exerts a high level of effort and perseveres toward goals

(F14) SELF-ESTEEM – believes in one’s self and maintains a positive view of self

(F15) SOCIABILITY – demonstrates to others that you care about them

(F16) SELF-MANAGEMENT – assesses self accurately, sets goals, exhibits self-control

(F17) INTEGRITY/HONESTY – chooses ethical courses of action

**WORKPLACE COMPETENCIES**

(C1) MANAGES TIME – sets relevant, goal related activities, ranks and allocates time
<table>
<thead>
<tr>
<th>Category</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manages</td>
<td>C2</td>
<td>MANAGES MONEY – uses or prepares budgets, keeps detailed records</td>
</tr>
<tr>
<td>Resources</td>
<td>C3</td>
<td>MANAGES MATERIAL – acquires, stores, and distributes materials, supplies, etc.</td>
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<td></td>
<td>C4</td>
<td>MANAGES HUMAN RESOURCES – assesses skills and distributes work</td>
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<tr>
<td></td>
<td>C5</td>
<td>ACQUIRES INFORMATION – identifies need for data, obtains and evaluates</td>
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<td></td>
<td>C6</td>
<td>ORGANIZES INFORMATION – organizes, processes, and maintains information</td>
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<tr>
<td>Information</td>
<td>C7</td>
<td>INTERPRETS INFORMATION – selects, analyzes info – communicates results</td>
</tr>
<tr>
<td></td>
<td>C8</td>
<td>USES COMPUTERS – to acquire, organize, analyze, and communicate information</td>
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<td></td>
<td>C9</td>
<td>PARTICIPATES AS A MEMBER OF A TEAM – contributes to group effort</td>
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<td></td>
<td>C10</td>
<td>TEACHES OTHERS – helps others learn needed knowledge and skills</td>
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<tr>
<td>Inter-Personal</td>
<td>C11</td>
<td>SERVES CLIENTS/CUSTOMERS – works to satisfy client/customer expectations</td>
</tr>
<tr>
<td>Skills</td>
<td>C12</td>
<td>EXERCISES LEADERSHIP – communicates ideas to justify position and leads others</td>
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<td></td>
<td>C13</td>
<td>NEGOTIATES – works toward agreements involving an exchange of resources</td>
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<tr>
<td></td>
<td>C14</td>
<td>WORKS WITH DIVERSITY – works well with people from diverse backgrounds</td>
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<td></td>
<td>C15</td>
<td>UNDERSTANDS SYSTEMS – social, organizational, and technological systems</td>
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<td></td>
<td>C16</td>
<td>MONITORS SYSTEMS – distinguishes trends, predicts impact</td>
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<td></td>
<td>C17</td>
<td>IMPROVES SYSTEMS – makes suggestions to modify existing systems</td>
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<tr>
<td></td>
<td>C18</td>
<td>SELECTS TECHNOLOGY – judges which technology will produce desired results</td>
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<tr>
<td></td>
<td>C19</td>
<td>APPLIES TECHNOLOGY – understands procedure for setup and use of machines</td>
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<tr>
<td></td>
<td>C20</td>
<td>MAINTAINS TECHNOLOGY – prevents, identifies, or solves technological problems</td>
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**Attendance Policy:**
Attendance will be considered in the faculty evaluation of the student.
There are no make-up classes for missed laboratory exercises. You may not attend another laboratory with another instructor to make-up the work.

**Emergency/Inclement Weather Procedure:**
In case of emergency or inclement weather conditions, Eastfield students should listen to KEOM-FM Radio Station (88.5) as the primary media source. In partnership with the Mesquite Independent School District, Eastfield College Administration will notify KEOM immediately after a decision is made to cancel classes on any given day of inclement weather or for emergency purposes. Students may also monitor other local radio and television stations. The earliest an announcement may be broadcast on KEOM Radio is 6 a.m. Students may also refer to the Eastfield College web page www.eastfieldcollege.com for the Inclement Weather announcement under the Features area of the front page. The announcement will be posted immediately following the decision to close the college.

**Financial Aid Statement:**
Students who are receiving any form of financial aid should check with the Financial Aid Office prior to withdrawing from classes. Withdrawals may affect your eligibility to receive further aid and could cause
you to be in a position of repayment for the current semester. Students who fail to attend or participate after the drop date are also subject to this policy.

**Financial Aid Statement for Distance Learning Classes:**
If you are receiving Financial Aid grants or loans and are enrolled in a Distance Learning class, you must show participation in this class prior to the certification date by either e-mailing or contacting the instructor or logging on to eCampus. Do not drop or stop attending any class without consulting the Financial Aid Office. Changes in your enrollment level and failing grades may require that you repay financial aid funds.

**Repeating This Course: (Third Attempt to Enroll in a Course):**
Effective for Fall Semester 2005, the Dallas County Community Colleges will charge additional tuition to students registering the third or subsequent time for a course. All third and subsequent attempts of the majority of credit and Continuing Education/Workforce Training courses will result in additional tuition to be charged. Developmental Studies and some other courses will not be charged a higher tuition rate. Third attempts include courses taken at any of the Dallas County Community Colleges since the fall 2002 Semester. See Third Attempt to Enroll in a Course at: [http://www.dcccd.edu/thirdcourseattempt/](http://www.dcccd.edu/thirdcourseattempt/)

**Academic Honesty:**
Scholastic dishonesty is a violation of the Code of Student Conduct. Scholastic dishonesty includes, but is not limited to, cheating on a test, plagiarism, and collusion. As a college student, you are considered a responsible adult. Your enrollment indicates acceptance of the DCCCD Code of Student Conduct published in the DCCCD Catalog at [http://www1.dcccd.edu/cat0506/ss/code.cfm](http://www1.dcccd.edu/cat0506/ss/code.cfm)

Academic dishonesty includes, but is not limited to, cheating on tests, plagiarism and collusion. *Cheating* includes copying from another student’s test or homework paper, using materials not authorized, collaborating with or seeking aid from another student during a test, knowingly using, buying, selling, stealing, or soliciting the contents of an unadministered test, and substituting for another person to take a test. *Plagiarism* is the appropriating, buying, receiving as a gift, or obtaining by any means another’s work and the unacknowledged submission or incorporation of it in one’s own written work. *Collusion* is the unauthorized collaboration with another person in preparing written work for fulfillment of course requirements. **Academic dishonesty is a serious offense in college. You will be given a failing grade for the course and recommended to be removed from Eastfield College.**

**Food and Drink Policy:**
Food, drinks, and tobacco products are prohibited in Eastfield College classrooms.

**ADA Statement:**
Students with a physical, mental or learning disability who require accommodations should contact the college Disability Services Office in C237. Call 972.860.8348 or email efcdso@dcccd.edu. For more information: [http://www.eastfieldcollege.edu/SSI/DSO/index.html](http://www.eastfieldcollege.edu/SSI/DSO/index.html)

**Religious Holidays:**
Absences for observance of a religious holy day are excused. Notification of the absence must be given to the instructor in writing at least two weeks prior to the date of the holy day. A student whose absence is excused to observe a religious holy day is allowed to contract with the instructor to take a make-up examination or complete an assignment within a mutually agreed upon time after the absence.
**Withdrawal Policy:**
If you wish to withdraw from the course with a grade of “W” you must complete the necessary forms by contacting Admissions counseling or PE/Science Division office no later than **April 17, 2019**. An instructor may not withdraw a student. Your instructor is NOT responsible for initiating or recommending this action. Failure to withdraw will result in the student receiving a performance grade based on the criteria contained in this syllabus. For more information about drop deadlines, refer to the current printed Credit Class Schedule, contact the Admissions/Registrar’s Office at 972-860-7167 (Room C119), or contact the division office. If you drop a class via eConnect, make sure to print a copy of the confirmation and keep the copy. In the event of a discrepancy it will be the responsibility of the student to provide documentation of having dropped the class.

**Classroom Etiquette:**

**Rules:**
Eastfield College extremely fortunate to have excellent facilities for classroom and laboratory studies. In microbiology (Biol 2421) students meet in the laboratory four hours per week. The laboratory is regarded as one of the most important aspects of the course. It is here students put into practice the concepts and ideas learned in the lecture room. In addition to the formal laboratory, small group discussions, media and guest speakers will be available to present additional aspects of microbiology. Each student in microbiology (BIOL) 2421 is considered a professional student, there to learn about this particular scientific endeavor. The laboratory will be conducted on that basis. In any laboratory certain standards must be maintained being particularly critical to one’s own well-being as well as that of others. These will be elaborated on during the first laboratory period. In any microbiology laboratory additional standards must be maintained. One’s own well-being and for the sake of others additional rules are mandated. There is **no eating or drinking in the laboratory or lecture** to prevent distraction of other students and eliminate the possibility of infection or contamination from microbes grown or chemicals used in the laboratory. Cellular telephones must be **turned off** during class period to prevent classroom disruption.

**Other items:**
No children are allowed in the classroom or laboratories at any time for safety reasons. Be on time, it is disruptive to other students when one is late.

**Student involvement:**
The student is strongly encouraged to make suggestions on how the laboratory or lecture material can be made more informative and effective. Any suggestions can be made directly to the instructor.

**Children on Campus:** The institution strives to protect an environment most conducive to teaching and learning for all enrolled students. Children who are taking part in organized scheduled activities or who are enrolled in specific classes are welcomed. Minor children, however, should not be brought to the institution unless closely supervised by their parent. Minor children should not be brought into classrooms, laboratories or other facilities of the college. This practice is disruptive to the learning process. In the case of an emergency where the student-parent has no alternative but to bring the child to campus, classroom faculty or the administrative heads of other units have full discretion as to whether a child may be allowed to quietly stay in the location. These individuals may require that children be removed by the student-parent from the setting if, in their opinion, the presence of the child is deemed to be disruptive to the learning process. For reasons of security and child welfare the institution will not permit unattended children to be left anywhere on the premises. Parents who have problems with childcare should visit the Counseling and/or Advisement Center to receive referrals to childcare services in the area.
The instructor reserves the right to amend this syllabus as necessary. The holy day. A student whose absence is excused to observe a religious holy day is allowed to contract with the instructor to take a make-up examination or complete an assignment within a mutually agreed upon time after the absence.

**OBTAINING YOUR GRADES AT THE END OF THE SEMESTER:** Grade reports are no longer mailed. Convenient access is available online or by telephone. Just use your student identification number when you log in to e-Connect or call DCCCD Touch Tone Services. Website address: [http://econnect.dcccd.edu/](http://econnect.dcccd.edu/). Telephone number: 972-613-1818.

**STOP BEFORE YOU DROP**
For students who enrolled in college level courses for the first time in the fall of 2007, Texas Education Code 51.907 limits the number of courses a student may drop. You may drop no more than 6 courses during your entire undergraduate career unless the drop qualifies as an exception. Your campus counseling/advising center will give you more information on the allowable exceptions. Remember that once you have accumulated 6 non-exempt drops, you cannot drop any other courses with a “W”. Therefore, please exercise caution when dropping courses in any Texas public institution of higher learning, including all seven of the Dallas County Community Colleges. For more information, you may access: [https://www1.dcccd.edu/coursedrops](https://www1.dcccd.edu/coursedrops)

**Family Educational Rights and Privacy Act of 1974 (FERPA)**
In compliance with the Family Educational Rights and Privacy Act of 1974 (FERPA), the College may release information classified as “directory information” to the general public without the written consent of the student. Directory information includes: (1) student name, (2) student address, (3) telephone numbers, (4) date and place of birth, (5) weight and height of members of athletic teams, (6) participation in officially recognized activities and sports, (7) dates of attendance, (8) educational institution most recently attended, and (9) other similar information, including major field of student and degrees and awards received. Students may protect their directory information at any time during the academic year. If no request is filed, directory information is released upon written inquiry. No telephone inquiries are acknowledged. No transcript or academic record is released without written consent from the student, except as specified by law.

The guidelines in this syllabus may be changed, deleted, or amended at any time by the instructor.

**Spring Academic Semester, 2019**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>January 2 (W)</td>
<td>College buildings and offices open</td>
</tr>
<tr>
<td>January 14 (M)</td>
<td>Faculty Reports</td>
</tr>
<tr>
<td>January 21 (M)</td>
<td>Dr. Martin Luther King, Jr. Holiday</td>
</tr>
<tr>
<td>January 22 (T)</td>
<td>Classes Begin</td>
</tr>
<tr>
<td><strong>February 4 (M)</strong></td>
<td><strong>12th Class Day</strong></td>
</tr>
<tr>
<td>February 28 - March 1 (R-F)</td>
<td>Professional Development Days -- Thursday and Friday day classes will not meet. Friday evening, Saturday and Sunday classes will meet.</td>
</tr>
<tr>
<td>March 4 (M)</td>
<td>Classes Resume</td>
</tr>
<tr>
<td>March 11-15 (M-F)</td>
<td><strong>Spring Break</strong> - College buildings and offices will be closed for the week.</td>
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<tr>
<td>Date</td>
<td>Event</td>
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<tr>
<td>March 18 (M)</td>
<td>Classes Resume</td>
</tr>
<tr>
<td>April 17 (W)</td>
<td>Last Day to Withdraw*</td>
</tr>
<tr>
<td>April 19 (F)</td>
<td>Holiday</td>
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<tr>
<td>April 22 (M)</td>
<td>Classes Resume</td>
</tr>
<tr>
<td>May 13-16 (M-R)</td>
<td>Final Exams</td>
</tr>
<tr>
<td>May 16 (R)</td>
<td>Semester Ends</td>
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<tr>
<td>May 20 (M)</td>
<td>Last Day for faculty to submit grades electronically through eConnect to the Registrar's Office.</td>
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<td>Ceremony dates may vary at the colleges depending on space available.</td>
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</tbody>
</table>

*This withdrawal date applies only to 16-week courses that begin on the first day of the semester. Classes that begin on different dates may have different deadlines to withdraw. Students should check "My Class Schedule" in eConnect to determine the last date to withdraw for each of their classes.*

A Mini-mester may be scheduled during May 17, 2019 through June 5, 2019. Contact the college for availability and schedules.

**An Academic Summer Session for Financial Aid Purposes is May 17, 2019 through August 8, 2019.**

See Financial Aid for more information.

**Summer Academic Semester, 2019**

**Summer I:**
(Summer I includes classes meeting on the following Fridays -- June 7, 14, 21, and 28 as class days.)

- May 27 (M)  Memorial Day Holiday
- June 6 (R)  Classes Begin
- June 10 (M) 4th Class Day
- June 25 (T) Last Day to Withdraw
- July 3 (W)  Final Exams/Summer I Ends
- July 4 (R)  Fourth of July Holiday
- July 8 (M)  Last Day for faculty to submit grades electronically through eConnect to the Registrar's Office.

**Summer II:**
(Summer II includes no classes meeting on Fridays.)

- July 8 (M)  Classes Begin
- July 11 (R) 4th Class Day
- July 30 (T) Last Day to Withdraw
- August 8 (R) Final Exams/Summer II Ends
- August 10 (S) Last Day for faculty to submit grades electronically through eConnect to the Registrar's Office.
**Summer Session:**  
(Ten Weeks include classes meeting on the following Fridays -- June 7, 14, 21, and 28 as class days.)

<table>
<thead>
<tr>
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<tbody>
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<td>May 27 (M)</td>
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<td>Classes Resume</td>
</tr>
<tr>
<td>July 22 (M)</td>
<td>Last Day to Withdraw</td>
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<tr>
<td>August 8 (R)</td>
<td>Final Exams/Summer Session</td>
</tr>
<tr>
<td>August 10 (S)</td>
<td>Final Exams/Summer Session</td>
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</table>