SLEEP
Neuroscience/Psychology 3375, Fall 2018

Professor: Dr. Michael Scullin
Room and Time: BSB C.230, MWF from 10:10am - 11:00am
Office Hours: MW: 9:30-10:00am, 2:00-3:30pm, or by appointment in BSB A330
Office Phone: 254-710-2251 Email: Michael_Scullin@Baylor.edu

Course Topic and Purpose
Sleep is one of the great enigmas of behavior and physiology. Why would individuals spend 1/3 of their lives in a state that prevents reproducing, collecting resources, or climbing social hierarchies? As Dr. Rechtschaffen eloquently put it: “If sleep does not serve an absolutely vital function, then it is the biggest mistake the evolutionary process has ever made.” In this course, we will collectively explore the psychological and neurobiological functions of sleep. You will develop your analytical skills by reading and discussing empirical journal articles. You will leverage your sleep expertise to disseminate knowledge of sleep health to the general public via community outreach projects.

Course Goals
- Acquire knowledge of the psychological and neurobiological tenets of sleep.
- Follow empirically-guided procedures to optimize learning and growth.
- Demonstrate comprehension of scientific methodologies via online and in-class discussion of articles.
- Apply, apply, apply! Translate your expertise to promote sleep health in yourself, at Baylor, and in Waco.

Course Policies
Attendance: The following is an excerpt from the College of Arts and Sciences Attendance Policy:

To earn course credit in the College of Arts and Sciences, a student must attend at least 75% of all scheduled class meetings. Any student who does not meet this minimal standard will automatically receive a grade of "F" in the course. Any University-related activity necessitating an absence from class shall count as an absence when determining whether a student has attended the required 75% of class meetings...departments and individual faculty members may establish more stringent requirements regarding attendance, punctuality, and participation.

No exceptions to Baylor University's policy can be made. If you arrive late to class, leave before class is over, or use your cell phone during class you will be counted as “absent” for that day. Being counted as “absent” for more than 10 classes, whether considered “excused,” “unexcused,” or “late,” will result in an automatic “F” for the course. Missed exams count as absences.

That’s the stick, but here’s the carrot: If you attend 42 classes, then I will drop your lowest quiz grade, drop your lowest online discussion grade, and curve your lowest test grade by three points. If you do not meet that super-star level of attendance for any excused or unexcused reason, I will still drop your lowest quiz grade if you attend ≥39 classes. Academic dishonesty disqualifies one from earning attendance incentives.

Phones: If you are having a family emergency or similar situation, let me know before class starts and you can have your phone on vibrate. Otherwise, using your phone counts as a class absence because even brief usage of phones is known to impair the learning of other students (Shelton et al., 2009).

Laptops: The empirical literature repeatedly shows better student success when taking notes by hand than when using laptops (e.g., Mueller & Oppenheimer, 2014). To create an environment that sets you up for success, laptops and tablets are not allowed in class. There is no required textbook to purchase (see optional book, below), which offsets the costs of printing the journal articles.

Seating: Following the empirical literature (Smith, 1982), you will have randomized seating assignments.

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Course Structure

Overview: Mondays and Wednesdays will involve lecture and interactive discussions. On Fridays, the class will “flip” and you will lead the discussion, based upon your readings of assigned journal articles.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
<th>Grading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes</td>
<td>200</td>
<td>A  (\geq 93.0%) (or (\geq 91.5%) with commendable outreach project)</td>
</tr>
<tr>
<td>Cumulative Test 1</td>
<td>200</td>
<td>A-  (\geq 90.0%) - 92.9%</td>
</tr>
<tr>
<td>Cumulative Test 2</td>
<td>200</td>
<td>B+  87.0% - 89.9%</td>
</tr>
<tr>
<td>Cumulative Final Exam</td>
<td>250</td>
<td>B    83.0% - 86.9% (or (\geq 81.5%) with commendable outreach)</td>
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<tr>
<td>Integrative Sleep Essay</td>
<td>100</td>
<td>B-   80.0% - 82.9%</td>
</tr>
<tr>
<td>Canvas Online Discussion</td>
<td>50</td>
<td>C+   77.0% - 79.9%</td>
</tr>
<tr>
<td>Sleep Outreach Project</td>
<td></td>
<td>C    70.0% - 76.9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>D    (&lt; 70.0%), F (&lt; 60.0%)</td>
</tr>
</tbody>
</table>

* See attendance and participation policy for opportunities to drop low grades, and to maximize points on quizzes. 

** Please be aware of the department’s “two-strike policy” (due to \(< C\) grades) for remaining in the major.

Optional Textbook:
Journal articles are the required readings for NSC/PSY 3375. There is not a required textbook, because most sleep textbooks were written for physicians to prepare for the sleep medicine board examination. The only reasonable undergraduate textbook is Dr. Dement’s self-published handbook that is specific to his course at Stanford. You are welcome to read Dr. Dement’s book as supplemental material, and it can be purchased at http://www.end-your-sleep-deprivation.com/stanford-sleep-book.html. You will only be tested on material covered in class and in the required journal article readings.

Weekly Quizzes and Lecture Participation:
Regular quizzing benefits learning and exam performance (Roediger et al., 2011). There will be weekly quizzes on the assigned readings (typically on Fridays). To incentivize you to stay active during all class periods, your weekly quiz score will be linked to whether you participated during the preceding lectures. If your weekly quiz grade is \(< 70\%\), then having participated in lecture earns you an additional 10\%. If you did not actively participate during the previous lecture, the highest score you can earn will be 90\%.

Cumulative Tests:
Following empirically-demonstrated benefits of distributing learning and re-testing, all tests will be cumulative and include content from both lecture and reading assignments (Cepeda et al., 2006). Tests will include short answer and integrative questions.

Integrative Sleep Health Essay (Email Essay by 10:00 AM on October 22)
You will maintain a sleep diary and wear an actiwatch for one week near the beginning of the semester and one week at the end of the semester. After the first time, you will be given your sleep data to examine and interpret. Afterward, you will write a paper that includes the following three sections:

A. Summarize your actigraphy and sleep diary results, identify and explain discrepancies between the two measures, and elaborate on any results that surprised you (1-1.5 pages).
B. Integrate your sleep patterns with lessons from each of the eight previous weeks (1.5-2 pages).
C. Detail the specific changes you can and will make to sleep better in the future (1-1.5 pages).

The paper should be 3-5 double-spaced pages with 1” margins and 12-size font (Times New Roman, Cambria, or Arial). The paper must include a title page and a references page (any consistent format is fine). Email the paper to michael.scullin@baylor.edu by 10:00 AM on October 22, making sure that the document is saved as “Last Name, First Name.docx.” Points are lost if the paper is late, outside the page limits, or not correctly formatted. The detailed grading rubric is available on Canvas.

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How to Effectively Read the Assigned Journal Articles

Each week you will read three journal articles. The quizzes will focus on the details of these articles whereas the tests will focus on broader issues. On Fridays, you will discuss some of the articles in groups. Make sure to print each paper and bring them to class. Students who attend office hours to discuss journal articles on Mondays and Wednesdays tend to show improvements in grades across the semester.

I have removed the abstract from each article to help you think deeply, analytically, and independently. Learning to effectively read and summarize journal articles is challenging, but great for developing analytical skills, and imperative for earning a bachelor's degree in psychology or neuroscience. Journal articles are challenging because they are much denser than textbooks, they often use unfamiliar jargon, and the true story of the paper emerges in its numbers rather than in its words. Thus, journal articles must be read *slowly and carefully.* If you are spending less than one hour reading an article you are going too fast. I recommend that you practice presenting each article out loud before class to identify gaps in your knowledge. Here are additional tips for getting the most out of the articles:

- Identify each section’s key components:
  - The rationale for conducting the research.
  - The study design (longitudinal vs. cross-sectional; within- vs. between-subjects; etc.).
  - The independent variables (manipulations) and dependent variables (outcomes).
  - Statistically significant results and null results that relate to the study’s rationale.
  - The authors’ conclusions/interpretations of their findings.
  - The study limitations and what research is still needed to fully test the original rationale.
- Examine all tables, figures, and captions in great depth. Tables and figures are the most important part of journal articles, yet many students only take a cursory look at them. The true story of the paper always emerges in the tables, figures, and figure captions.
- Be critical! Let me repeat that—be critical! You do not have to agree with the authors. If you think they overstated their results or used an inappropriate methodology, then you should say so.
- Think deeply about the “big picture.” How does the study integrate with or oppose what you have learned in class or in other articles? Did any aspect of the study change your perspective on sleep?

Weekly Postings on Journal Articles to the Canvas Discussion Board

**Overview:** Spacing out readings and discussing articles online promote student achievement (Parks-Stamm et al., 2017). Therefore, each week you will post two questions about the week's journal articles and reply to at least two classmate's postings. All question and reply entries must be posted every Thursday by 11:59 PM. As a class, you will therefore need to collectively space out your readings/postings and encourage others to do the same.

**Question Types:** One of your questions can be methodological (e.g., "Is mentalis electromyography the same thing as EEG?"). One question, however, must raise a theoretical issue that integrates with other course materials or covers a "big picture" issue that can incite group discussion. The questions you post need to be distinct from the questions already posted. Note that your posts need not be framed as questions per se so long as they are written to encourage further discussion.

**Grading:** The maximum score is 100% each week. Posting two distinct questions is worth 70% and posting two distinct replies to classmates is worth 30%. The deadline is typically on Thursday at 11:59 PM; for each 0.1-to-23.9 hour period after the deadline, posts will incur a 15% deduction. Posts that are not unambiguously distinct from a classmate’s prior post incur a 10% deduction each. The best approach for success is to do your readings and postings early in the week and edit any posts that are not clearly disambiguated from prior postings. To incentivize in-class discussion, your weekly Canvas Discussion score will be linked to whether you participated in class on Fridays without having to be called upon. If your weekly Canvas Discussion grade is <70%, then having participated in-class on Friday earns you an additional 10%. If you did not participate without being called upon during the in-class discussion, the highest score you can earn will be 90%. Bonus points will be awarded at the end of the semester for the students with the most consistent, highest-quality postings.

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Sleep Health Outreach Project

Overview:
Generosity, or your willingness to share resources with others, is a key value in our society (including our local Christian-focused community). All Baylor students have a highly valuable resource—knowledge gained—and you should share that resource outside of university settings. Doing so is empirically demonstrated to benefit the community and enhance your learning (Waterman, 2013). To this end, I want for you to create an innovative, community-based outreach project that promotes sleep health awareness.

Idea Brainstorming: You can do the project by yourself or with one teammate. I want for you to be creative, and to do your project on something that speaks to your heart. If I were doing this project, I would create a booth of sleep science activities at a children's museum, and teach kids and their families about sleep for the entire day. (We actually do that twice each year). Students have successfully directed a sleep art exhibit (7Twelve), met with veterans (One Stop), and helped homeless individuals (Meyer Clinic). They have spent time with youth at Cameron Park Zoo, Talitha Koum, and the YMCA. One innovative student composed and played a piano song based on sleep EEG waves, another innovative student changed how the Waco Humane Society regulated sleep patterns for dogs, and a third innovative student wrote and illustrated a children's sleep book and read it at a daycare facility. These are but a few of the massively successful projects that Baylor students have completed since 2016. I want for you to find something you can be passionate about that affects the larger community outside of college campuses.

Outreach Project Deadlines
- September 24: E-mail team names and three or more ideas that range in ambition (one that is easy, one that is “pie-in-the-sky,” and one that is somewhere in-between) by 11:59 PM on September 24.
- October 10: Using the proposal template on Canvas, submit the final idea, outline of deadlines, and each team member’s responsibilities by 11:59 PM on October 10.
- November 20: E-mail a reflection paper to Michael_Scullin@Baylor.edu by 11:59 pm on November 20 that details your completed activities and reflects on your experience. There is no page limit, but your paper will be evaluated based on the quality of writing, thoroughness of the described activities, and thoughtfulness of the reflection (i.e., positives of the experience and what you wish you had done differently). You are welcome to include pictures and data figures, as appropriate for your project.
- November 26 - 30: Orally present your completed project to the class. Make sure to include pictures, video, or other relevant information to show you enacting your outreach project. Email the ppt/weblink by 9:30 AM on November 26.

Rating Levels
- Unacceptable: Student fails to complete the assignment, adding a grade of 0 of 100 points.
- Acceptable: An acceptable rating results in no change to the student's grade. This rating is applied when a student misses one or more deadlines, does not execute the project fully according to the instructor's feedback, interacts with fewer than 20 community members, or provides less than B level quality on the reflection paper or oral presentation.
- Commendable: The commendable rating increases the student's pre-final-exam grade by 1.5% points and lowers the grading scale for an A (from ≥93.0% to ≥91.5%) and a B (from ≥83.0% to ≥81.5%). The commendable rating is applied when the student/team misses zero deadlines, revises and executes the project according to the instructor’s feedback, interacts with 20 or more community members, and provides at least B level quality on the reflection paper and oral presentation.

Bonuses: There will be 0.5% point prizes for projects that receive the most votes from classmates, for exceptional written and oral reports, and for the project that connects with the most people in the community. The record is reaching 600 community members.

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<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture Topic</th>
<th>Required Reading (Journal Articles)</th>
<th>Optional Reading (Dement, 2006)</th>
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<tbody>
<tr>
<td>8/20</td>
<td>History of Sleep Science</td>
<td>Reyner (2013)</td>
<td>Chapter 1</td>
</tr>
<tr>
<td>8/22</td>
<td>Universals and Cultural Adaptations</td>
<td>Alkozei (2017)</td>
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<tr>
<td>8/27</td>
<td>Nonhuman Sleep</td>
<td>Lyamin (2018)</td>
<td></td>
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<tr>
<td>8/29</td>
<td>Subjective and Objective Sleep Measurement</td>
<td>Meltzer (2015)</td>
<td>Chapter 2</td>
</tr>
<tr>
<td>9/3</td>
<td>No Class - Labor Day Holiday</td>
<td>Dement (1957)</td>
<td></td>
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<tr>
<td>9/5</td>
<td>Polysomnography</td>
<td>Drake (2013)</td>
<td></td>
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<tr>
<td>9/7</td>
<td>Discuss journal articles</td>
<td>St-Onge (2016)</td>
<td></td>
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<tr>
<td>9/10</td>
<td>Neurobiology of Sleep</td>
<td>De Vivo (2017)</td>
<td></td>
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<tr>
<td>9/12</td>
<td>Neurobiology of Sleep</td>
<td>van der Helm (2011)</td>
<td></td>
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<tr>
<td>9/14</td>
<td>Discuss journal articles</td>
<td>Yetish (2015)</td>
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<tr>
<td>9/17</td>
<td>Circadian Rhythms</td>
<td>Chang (2015)</td>
<td>Chapters 3, 5, 6</td>
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<tr>
<td>9/19</td>
<td>Circadian Rhythms</td>
<td>Smarr (2018)</td>
<td></td>
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<tr>
<td>9/21</td>
<td>Discuss journal articles</td>
<td>Smith (2013)</td>
<td></td>
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<tr>
<td>9/24</td>
<td>Catch up</td>
<td></td>
<td></td>
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<tr>
<td>9/26</td>
<td>Discuss outreach projects</td>
<td></td>
<td></td>
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<tr>
<td>9/28</td>
<td>Test 1</td>
<td></td>
<td></td>
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<tr>
<td>10/1</td>
<td>Sleep Deprivation I: Methodologies</td>
<td>Frenda (2015)</td>
<td>Chapters 4, 7</td>
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<tr>
<td>10/3</td>
<td>Sleep Deprivation II: Behavioral/Mental Health</td>
<td>Landrigan (2004)</td>
<td></td>
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<tr>
<td>10/5</td>
<td>Discuss journal articles</td>
<td>Prather (2015)</td>
<td></td>
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<tr>
<td>10/8</td>
<td>Sleep Deprivation III: Sleep Debt</td>
<td>Mitler (1998)</td>
<td>Chapter 8</td>
</tr>
<tr>
<td>10/10</td>
<td>Sleep Deprivation IV: Physiological Impact</td>
<td>Wu (2006)</td>
<td></td>
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<tr>
<td>10/12</td>
<td>Discuss journal articles</td>
<td>Möller-Levet (2013)</td>
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<tr>
<td>10/15</td>
<td>Memory Consolidation</td>
<td>Debate (2005)</td>
<td></td>
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<tr>
<td>10/17</td>
<td>Discuss journal articles</td>
<td>Mazza (2016)</td>
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<tr>
<td>10/19</td>
<td>No Class - Fall Break</td>
<td></td>
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<tr>
<td>10/22</td>
<td>Paper Due; Memory, Basics of Dreaming</td>
<td>Cartwright (1998)</td>
<td>Chapters 10, 11, 12</td>
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<tr>
<td>10/24</td>
<td>Theories of Dreaming and Nightmares</td>
<td>Voss (2014)</td>
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<tr>
<td>10/26</td>
<td>Discuss journal articles</td>
<td>Stickgold (2000)</td>
<td></td>
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<tr>
<td>10/29</td>
<td>Sleep Across Development</td>
<td>Mindell (2009)</td>
<td></td>
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<tr>
<td>10/3</td>
<td>Sleep Across Development</td>
<td>Wing (2015)</td>
<td></td>
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<tr>
<td>11/2</td>
<td>Discuss journal articles</td>
<td>Ju (2017)</td>
<td></td>
</tr>
<tr>
<td>11/5</td>
<td>Sleep and Healthcare</td>
<td></td>
<td>Chapter 15</td>
</tr>
<tr>
<td>11/7</td>
<td>Catch up</td>
<td></td>
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<tr>
<td>11/9</td>
<td>Test 2</td>
<td></td>
<td></td>
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<tr>
<td>11/12</td>
<td>Sleep Disorders</td>
<td>Mahowald (2006)</td>
<td>Chapters 16, 18, 20</td>
</tr>
<tr>
<td>11/14</td>
<td>Sleep Disorders</td>
<td>Woloshin (2006)</td>
<td></td>
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<tr>
<td>11/16</td>
<td>Sleep Disorders</td>
<td>Perlis (2001)</td>
<td></td>
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<tr>
<td>11/19</td>
<td>journal articles, Outreach Project (11/20)</td>
<td>(see previous week)</td>
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<tr>
<td>11/21-23</td>
<td>No Class - Thanksgiving Break</td>
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<tr>
<td>11/26</td>
<td>Presentations – ppt/link due by 9:30am</td>
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<tr>
<td>11/28</td>
<td>Presentations</td>
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<tr>
<td>11/30</td>
<td>Presentations</td>
<td></td>
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</tr>
<tr>
<td>12/3</td>
<td>Catch up and review</td>
<td></td>
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</tbody>
</table>
Journal Article Readings (Posted to Canvas)

Week 1 – Introduction (8/24)

Week 2 – Sleep Measurement in Humans and Nonhumans (8/31)

Week 3 – Polysomnography (9/7)
2. Drake, C., Roehrs, T., Shambroom, J., & Roth, T. (2013). Caffeine effects on sleep taken 0, 3, or 6 hours before going to bed. *Journal of Clinical Sleep Medicine, 9*, 1195-1200.

Week 4 – Neurobiology of Sleep Regulation (9/14)

Week 5 – Circadian Rhythms (9/21)

Week 6 – Behavioral Impact of Sleep Deprivation (10/5)

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Week 8 – Physiological Impact of Sleep Deprivation (10/12)

Week 9 – Memory Consolidation (Quiz on Wednesday 10/17, Canvas Discussion due 10/16 before midnight)

Week 10 – Dreaming (10/26)

Week 11 – Sleep Across Development (11/2)

Week 13 – Sleep Disorders (Quiz on Monday 11/19, Canvas Discussion due 11/15 before midnight)
Student Resources for Academic Success

I sincerely hope you will visit during office hours to discuss course materials and your career goals. I believe every student who has been admitted to Baylor can be successful. Students who have made a weekly habit of coming to office hours have often gradually improved their grades. If your academic performance is substandard, I will submit an Academic Progress Report to the Success Center. Those reports are intended to encourage you to get the help you need to learn more fully. Learning resources are available through the Paul L. Foster Success Center in Sid Richardson or by going to: www.baylor.edu/successcenter. Even if you do not need help, you can get involved by tutoring other students in the future or by telling a hall mate how and where to get help.

Student Resources for Disabilities

Any student who needs academic accommodations related to a documented disability should inform me immediately at the beginning of the semester. You are required to obtain appropriate documentation and information regarding accommodations from the Office of Access and Learning Accommodation (OALA). Contact Information: (254) 710-3605 - Paul L. Foster Success Center, Sid Richardson, 1st floor, East Wing.

Baylor University Title IX Policy

Baylor University does not discriminate on the basis of sex or gender in any of its education or employment programs and activities, and it does not tolerate discrimination or harassment on the basis of sex or gender. This policy prohibits sexual and gender-based harassment, sexual assault, sexual exploitation, stalking, intimate partner violence, and retaliation (collectively referred to as prohibited conduct). For more information on how to report or to learn more about our policy and process, please visit www.baylor.edu/titleix or call the Title IX Office at (254) 710-8454.

Student Resources for Veterans and Military Personnel

Veterans and active duty military personnel are welcomed and encouraged to communicate, in advance if possible, any special circumstances (e.g., upcoming deployment, drill requirements, disability accommodations). You are also encouraged to visit the VETS Program Office with any questions at (254) 710-7264.

Academic Integrity

As a Baylor student, I expect you to be familiar with the Honor Code: www.baylor.edu/honorcode/. You will sign an honor code before each test (see below). Violations of the honor code will be reported to the Honor Council and may result in course failure. Not understanding plagiarism/cheating is not an excuse.

Final Exam

The cumulative final exam will be on Saturday, December 8 from 8:00 AM - 10:00 AM. Baylor University’s policy is that you can only reschedule a final exam if you have three finals on the same day and notify the instructor and the Dean’s office (Burleson 110) greater than one month prior to finals.

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