BSC 427. PHARMACOLOGY
COURSE SYLLABUS: FALL 2019

COURSE INFORMATION

Materials – Textbooks, Readings, Supplementary Readings

Textbook(s) Required: None
Software Required: Please see technology requirements.
Optional Texts and/or Materials: N/A

Course Description
This course is designed for undergraduate students with a background in biology, cell biology and chemistry. Therefore, this course provides students with a greater understanding of general concepts of pharmacology. Next, specific drugs and sites of drug action are further examined beginning with the peripheral, followed by the central nervous system. We then will focus on the pharmacology of the heart, the vascular and renal systems, followed by pharmacology of the respiratory system, then endocrine system and drugs affecting the immune system. Finally we examine the pharmacology of infectious disease. Pre-requisites: BSC 303/CHEM 1411.

The syllabus/schedule are subject to change.
Student Learning Outcomes (Should be measurable; observable; use action verbs)

Upon completion of this course you should be able to:

1. Tell the basic groups of endogenous proteins that are bound by drugs, the effects of drug binding on their molecular targets and methods for analyzing drug binding.
2. Explain the major types of receptors, their structures and associated signal transduction mechanisms.
3. Discuss the chemical mediators and peripheral nervous system, components and basic physiology of cholinergic transmission and drugs acting on cholinergic system.
4. Articulate on the basic physiology of noradrenergic, 5-hydroxytryptamine and purinergic transmission and associated drugs; cannabinoids and local hormones and their importance.
5. Explain the importance of nitric oxide signaling; gain general understanding of adverse cardiovascular conditions and drugs used to treat these conditions.
6. Discuss about anti-inflammatory drugs and drugs used to treat respiratory, GI and kidney disorders.
7. Understand the basic concepts of endocrine and reproductive system disorders and associated drugs for treatment.
8. Explain the basic disease/disorder mechanisms of the central nervous system and know the major drugs acting on CNS.
9. Discuss the basic concepts of addiction, drug toxicity, individual variations in drug effectiveness and sports drugs.

COURSE REQUIREMENTS

Minimal Technical Skills Needed
Standard skills necessary to use web browsers to access course materials is required. Students should also be able to submit their work as necessary. Students should be able to use Microsoft Word and PowerPoint.

Instructional Methods
Formal lectures will be supplemented with appropriate audiovisual materials, and assignments. I will post announcements on the home page of the course, announce them in the class or send email notifications.

Student Responsibilities or Tips for Success in the Course
Regular attendance
Submitting assignments before deadlines
Checking both course page and emails for course related announcements

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GRADING

Final grades in this course will be based on the following scale:

A = 90%-100%
B = 80%-89%
C = 70%-79%
D = 60%-69%
F = 59% or Below

Assessments

Students are expected to attend ALL scheduled lectures and labs and take the exams/quizzes as scheduled. There will be a 6 point credit for attendance. Excused absences as defined in the Student Handbook of the university will be accepted.

There will be three types of assessments that will contribute to the grade. These are:
1. Quizzes
2. Exams
3. Assignments

Distribution:
Quiz  = 24% (4 quiz; 6%/quiz)
Exams = 30% (3 exams; 10%/exam)
Attendance = 6%
Assignment = 10% (two; 5% for each)
Final Exam* = 30%

*Final exam is a comprehensive exam that will cover all the chapters.

Exams and quizzes consist of multiple choice questions. Questions are drawn from the same test pool. Therefore some questions may be repeated. Students will take exams and quizz in the classroom.

Important information:
1. There will not be any additional points extra credits. A student’s grade will come only from the points he/she earns in the three types of assessments.
2. All assignments should be submitted before the deadlines. Late submissions will automatically receive ZERO points.
3. No requests to open the exams or quizzes earlier will be accepted.
4. All requests for make-up exams/quizzes must accompany supporting documents (e.g. a doctor’s note). Such requests should be made within two days after missing the exam/quiz. The reasons for not taking an exam/zero within the designated should be acceptable, as outlined in your student handbook. Forgetting to take the exam/quiz will not be an acceptable reason.

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5. It is the students’ responsibility to check emails and course website for exam/quiz dates and assignment postings & deadlines.

TECHNOLOGY REQUIREMENTS

Browser support
D2L is committed to performing key application testing when new browser versions are released. New and updated functionality is also tested against the latest version of supported browsers. However, due to the frequency of some browser releases, D2L cannot guarantee that each browser version will perform as expected. If you encounter any issues with any of the browser versions listed in the tables below, contact D2L Support, who will determine the best course of action for resolution. Reported issues are prioritized by supported browsers and then maintenance browsers.

Supported browsers are the latest or most recent browser versions that are tested against new versions of D2L products. Customers can report problems and receive support for issues. For an optimal experience, D2L recommends using supported browsers with D2L products.

Maintenance browsers are older browser versions that are not tested extensively against new versions of D2L products. Customers can still report problems and receive support for critical issues; however, D2L does not guarantee all issues will be addressed. A maintenance browser becomes officially unsupported after one year.

Note the following:

- Ensure that your browser has JavaScript and Cookies enabled.
- For desktop systems, you must have Adobe Flash Player 10.1 or greater.
- The Brightspace Support features are now optimized for production environments when using the Google Chrome browser, Apple Safari browser, Microsoft Edge browser, Microsoft Internet Explorer browser, and Mozilla Firefox browsers.

### Desktop Support

<table>
<thead>
<tr>
<th>Browser</th>
<th>Supported Browser Version(s)</th>
<th>Maintenance Browser Version(s)</th>
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</thead>
<tbody>
<tr>
<td>Microsoft® Edge</td>
<td>Latest</td>
<td>N/A</td>
</tr>
<tr>
<td>Microsoft® Internet Explorer®</td>
<td>N/A</td>
<td>11</td>
</tr>
<tr>
<td>Mozilla® Firefox®</td>
<td>Latest, ESR</td>
<td>N/A</td>
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## Browser Support

<table>
<thead>
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<th>Browser</th>
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<th>Maintenance Browser Version(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Google® Chrome™</td>
<td>Latest</td>
<td>N/A</td>
</tr>
<tr>
<td>Apple® Safari®</td>
<td>Latest</td>
<td>N/A</td>
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</tbody>
</table>

### Tablet and Mobile Support

<table>
<thead>
<tr>
<th>Device</th>
<th>Operating System</th>
<th>Browser</th>
<th>Supported Browser Version(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Android™</td>
<td>Android 4.4+</td>
<td>Chrome</td>
<td>Latest</td>
</tr>
<tr>
<td>Apple</td>
<td>iOS®</td>
<td>Safari, Chrome</td>
<td>The current major version of iOS (the latest minor or point release of that major version) and the previous major version of iOS (the latest minor or point release of that major version). For example, as of June 7, 2017, D2L supports iOS 10.3.2 and iOS 9.3.5, but not iOS 10.2.1, 9.0.2, or any other version. Chrome: Latest version for the iOS browser.</td>
</tr>
<tr>
<td>Windows</td>
<td>Windows 10</td>
<td>Edge, Chrome, Firefox</td>
<td>Latest of all browsers, and Firefox ESR.</td>
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- You will need regular access to a computer with a broadband Internet connection. The minimum computer requirements are:
  - 512 MB of RAM, 1 GB or more preferred
  - Broadband connection required courses are heavily video intensive
  - Video display capable of high-color 16-bit display 1024 x 768 or higher resolution

- **For YouSeeU Sync Meeting sessions 8 Mbps is required.** Additional system requirements found here: [https://support.youseeu.com/hc/en-us/articles/115007031107-Basic-System-Requirements](https://support.youseeu.com/hc/en-us/articles/115007031107-Basic-System-Requirements)

- You must have a:

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- Sound card, which is usually integrated into your desktop or laptop computer
- Speakers or headphones.
- *For courses utilizing video-conferencing tools and/or an online proctoring solution, a webcam and microphone are required.

- Both versions of Java (32 bit and 64 bit) must be installed and up to date on your machine. At a minimum Java 7, update 51, is required to support the learning management system. The most current version of Java can be downloaded at: JAVA web site  http://www.java.com/en/download/manual.jsp

- Current anti-virus software must be installed and kept up to date.

Running the browser check will ensure your internet browser is supported.

- Pop-ups are allowed.
- JavaScript is enabled.
- Cookies are enabled.

- You will need some additional free software (plug-ins) for enhanced web browsing. Ensure that you download the free versions of the following software:
  - Adobe Reader  https://get.adobe.com/reader/
  - Adobe Flash Player (version 17 or later)  https://get.adobe.com/flashplayer/
  - Adobe Shockwave Player  https://get.adobe.com/shockwave/

- At a minimum, you must have Microsoft Office 2013, 2010, 2007 or Open Office. Microsoft Office is the standard office productivity software utilized by faculty, students, and staff. Microsoft Word is the standard word processing software, Microsoft Excel is the standard spreadsheet software, and Microsoft PowerPoint is the standard presentation software. Copying and pasting, along with attaching/uploading documents for assignment submission, will also be required. If you do not have Microsoft Office, you can check with the bookstore to see if they have any student copies.

**ACCESS AND NAVIGATION**

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu.

**Note:** Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary

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use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

COMMUNICATION AND SUPPORT

Brightspace Support

Need Help?
Student Support

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778 or click on the Live Chat or click on the words “click here” to submit an issue via email.

System Maintenance

D2L runs monthly updates during the last week of the month, usually on Wednesday. The system should remain up during this time unless otherwise specified in an announcement. You may experience minimal impacts to performance and/or look and feel of the environment.

Interaction with Instructor Statement

Students are encouraged to interact with the instructor during active classroom learning sessions. Response time for Response time to any questions sent by email regarding the course will be within 72 hours. Weekends and holidays are excluded. Students need to use the office hours indicated in this syllabus.

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures/Policies

Students are expected to attend ALL scheduled lectures and take the exams/quizzes as scheduled. There will be a 6 point credit for attendance. Excused absences as defined in the Student Handbook of the university will be accepted. Students are expected to come to class in time. There are no extra credits and late submissions or missed exams/quiz will result in lower than expected grade.

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Syllabus Change Policy
The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

University Specific Procedures

Student Conduct
All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the Student Guidebook. http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: Netiquette http://www.albion.com/netiquette/corerules.html

TAMUC Attendance
For more information about the attendance policy please visit the Attendance webpage and Procedure 13.99.99.R0.01. http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf

Academic Integrity
Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

Undergraduate Academic Dishonesty 13.99.99.R0.03

Graduate Student Academic Dishonesty 13.99.99.R0.10
http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf

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ADA Statement

Students with Disabilities
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services
Texas A&M University-Commerce
Gee Library- Room 162
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
Email: studentdisabilityservices@tamuc.edu
Website: Office of Student Disability Resources and Services
http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/

Nondiscrimination Notice
Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement
Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer.

Web url:
http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf

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Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

COURSE OUTLINE / CALENDAR

Week 1: Meet and Greet
Chapter 1 - General principles of drug action: drug binding, protein targets of drug binding, agonist types, drug-receptor interactions, measurement of drug binding, drug antagonism, desensitization.

Week 2: Chapter II – Molecular aspects of drug action: receptor groups, structure and signal transduction mechanisms, ion channels, G-protein coupled receptors

Week 3: Chapter II (contd.): receptor tyrosine kinases, nuclear receptors
Chapter III: Absorption and translocation of drugs: translocation of drug molecules, drug disposition, special delivery systems.

Week 4: Chapter IV: Drug elimination and pharmacokinetics: drug metabolism, renal excretion of drugs and drug metabolites, biliary excretion, pharmacokinetics.

Week 5: Chapter V: Chemical mediators of the autonomic nervous system: peripheral nervous system, chemical transmission, mechanisms of transmitter release, termination of transmitter action.

Week 5: Chapter VI: Cholinergic transmission: acetylcholine receptors, physiology of cholinergic transmission, effects of drugs on cholinergic transmission.
Chapter VII: Noradrenergic transmission: classification, physiology and drugs.

Week 6: Chapter VIII: 5-Hydroxytryptamine, purines, local hormones, cannabinoids

Week 7: Chapter IX: Peptides and proteins as mediators and nitric oxide signaling

Week 8: Chapter X: Drugs affecting heart, circulatory system and blood

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Week 9: Chapter XI: Anti-inflammatory drugs, respiratory system, kidney, GI tract, glucose metabolism and obesity.

Week 10: Chapter XII: pituitary, adrenal cortex, thyroid, reproductive system and bone metabolism.

Week 11: Chapter XIII: drugs acting on the central nervous system

Chapter XIV: Neurodegenerative diseases, anesthetic and analgesic drugs

Chapter XV: Anxiolytic and hypnotic drugs

Week 12: Antipsychotic and antidepressant drugs

Week 13: CNS stimulants, addiction, dependence and abuse

Week 14: Drugs used for treatment of infections, cancer and immunological disorders.

Week 15: Special topics: individual variations, drug interactions, harmful effects, lifestyle drugs, sports drugs, etc.

Cumulative Final: Tuesday, December 11th, 2018 10.30 am - 12.30 pm.

*Please check the academic calendar for details on holidays and start and end dates of the current semester. First day of class is August 27, 2018. Date and time for exams and quizzes will be announced in class.

*ALL DATES AND CHAPTERS COVERED ARE TENTATIVE AND SUBJECT TO CHANGE.

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