BSC 517 Stem Cell Biology, CRN: 85904
Fall 2021

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Office Hours: **Monday, Wednesday, and Friday 12 PM−1
PM. Office hrs will be conducted via Chat
or YouSeeU virtual class room in D2L.**

Or by appointment, include BSC 517 Stem Cell
Biology in subject line of E-mails.

COURSE OVERVIEW:
This course will provide graduate students with an in-depth account of stem cell biology, various forms of stem cells and their application to regenerative medicine. Special reference will be made to molecular, epigenetic, and genetic control of stem cell differentiation and specializations. Existing and potential clinical use of stem cells, its derivatives, and induced pluripotent stem cells also will be discussed. Since this is rapidly developing field with sweeping social implications, strong emphasis will be placed on understanding the current controversies surrounding stem cell research.

STUDENT LEARNING OUTCOMES (SLO):
At the end of this course students will be able to:
1. Describe the difference between embryonic, adult and induced pluripotent stem cells and how they differ from fully differentiated cells.
2. Describe the properties and use of stem cells.
3. Gain a knowledge of the intrinsic and extrinsic factors important for stem cell renewal and differentiation.
4. Understand the clinical significance of stem cell research and the possible problems that need to be overcome.
5. Could discuss the ethical issues associated with embryonic stem cells and stem cell therapy with a global bioethics perspective. (G)

REQUIRED TEXTBOOK
You are not required to buy text book for this course. We will be using materials from the

following open source books and original articles. You may download the electronic version of the following books from internet.

1. **Essentials of Stem Cell Biology, Second Edition, 2009, Edited by Robert Lanza**, M.D., ISBN: 978-0-12 374729-7, Elsevier Inc. Digital copy of this book is available free from A&M-Commerce Library http://tinyurl.com/yyf8qdwq

2. **StemBook**. Open-access collection of original, peer-reviewed chapters covering topics related to stem cell biology. Chapters required for class will be specified in the course schedule. StemBook can be accessed @ http://www.stembook.org

3. **NIH Stem Cell Information Home Page. In Stem Cell Information [World Wide Web site]. Bethesda, MD: National Institutes of Health, U.S. Department of Health and Human Services. Available @ http://stemcells.nih.gov/Pages/Default.aspx**

INSTRUCTION METHOD
This syllabus is a suggested outline. It represents the minimum material that we will cover in this course. Dates are approximate and subject to change. If there is any major changes to the syllabus it will be posted in e-College and the syllabus will be updated accordingly. You are responsible for keeping up with any changes made to the syllabus. *You may be tested on any material listed in the syllabus, on your class page and discussed in class.*

Web-Based Course: The structure of this course is predicated at student reading. Considering enormous volume of information available in Stem Cell Biology field, it is impossible to cover everything in a course. ***Since it is an online graduate level course lot of self learning will be involved and a minimum of one chapter of reading and associated work will be required per week***. ***This means you need to spend a considerable amount of time in integrating the materials that been covered in this course.*** I have selected these chapters to provide basics in Stem Cell Biology. PowerPoint slides, additional reading materials as well as activities will be included to help your learning. Your progress in this course will be measured using weekly quizzes, two exams (a mid-term and a final), and a debate topic. You can monitor your progress in D2L Gradebook.

How to Succeed in the Class: For successful course completion, your active and timely participation is essential. As an online class on Stem Cell Biology, I expect that you have a back ground in cell biology. You must read chapters prescribed for each week and go through additional lecture materials, assignments and activities. From my prior experience, exchanging e-mails are poor strategies of online learning, therefore, ***I encourage to clear any questions that you may have during electronic office hours (M,W, & F 12 PM–1 PM) via the "YouSeeU-Virtual Classroom" feature available in D2L-Brightspace.***

Class Policies: In this online class, students are required to be self-learners and self-directed. The fact that you might be taking several online classes and working full time may put additional pressure on you, but it would not be considered as a reason for diluting the rigor of this course. **This class will keep the rigor, time line, and standards of a face-to-face class.**

E-mail and Communication: If you are e-mailing me please use your university e-mail account and please put BSC 517, Stem Cell Biology in subject line. If you use an e-mail account without an ".edu" extension, it may end up in my spam folder. During work days, I will respond to e-mails within 24 hrs and e-mails received during weekends will be responded on the next working day. Most of the correspondence will be announced on the course homepage, therefore check course homepage in D2L-Brightspace as-often-as possible.

Electronic Office Hours: You may access office hours on Monday, Wednesday, and Friday at 12 –1 pm CST.

Lecture Materials: Power Point slides that I use for delivering lectures in face-to-face course will be made available in D2L (Brightspace). Note that *lecture slides must not be treated as lecture notes. You may use it as a reference or guide to read the book but not as study material.* If you use PowerPoint slides as the main source for your study, you may not perform well in tests. ***Materials provided in this course including lecture slides are copy righted and must not share them without obtaining permission.***

Assignments:
Quizzes, (150 points total): Throughout the term of this course, 10 QUIZZES will be conducted which needs to be taken online in D2L. Each quiz will contain 10–15 questions and worth of 15 points. If you miss a quiz or perform poorly, there won't be any makeup quiz.

Assignment: The Master's graduate in Biology is expected to be well informed about current issues and cutting edge developments in biology. By the end of this course you are required to complete a **1000 words essay (without reference) on an assigned topic."** You may want to work on this essay as you go through the course. **Completed essay is due at 11.59 PM on October 31st**.

As a graduate student, you are expected to demonstrate evidence of cogent and reflective thought while discussing a topic and respectful to others opinions. Therefore, After submission you are required to submit a 100 word summary of your essay in discussion board and each student is expected to participate and actively discuss the topics at hand before **November 20th.**

For an effective discussion, you are **required to: 1) submit the summary of your essay 2) read other students' summary and respond to at least one summary, and 3) reply to at least one comment. Other requirements include:**
- Posts should be a minimum of 120–150 words.
- Posts should be relevant to the topic being discussed, but should also attempt to introduce a new point of view or piece of information or otherwise further the discussion.
- Posts must be in your own words, while you may cite references, sentences from citation must be paraphrased.

Exams and Grades: For this course there will be four exams including a cumulative final (200 points each, or 20% each) throughout the term. Exam questions will test critical thinking, analytical ability, and the understanding of subject matter. Therefore, it is important to understand the concepts. If you miss an exam for reasons other than university-approved emergencies, make up exams would not be provided. In the event of a makeup examination, it will be provided only in the A&M-Commerce campus, which means you need to travel to the campus.

Grading Policy:

4 exams including the final	= 800 points (80%)
Quizzes	= 100 points (10%)
Assignment	= 100 points (10%)
TOTAL	= 1000 points (100%)

Grading Scale:
A = 900 to 1000 points (>90%)
B = 800 to 899 points (80% to 89%)
C = 700 to 799 points (70% to 79%)

D = 600 to 699 points (60% to 69%)
F = 599 or fewer (<59%)

To calculate where you stand: Your up to date scores and percentage will be available in the grade book of D2L. Add your 3 exam scores, scores in assignments, and your final score of lab and assignment plus any extra credit points that you have, which will be your total score in 1000. Calculate the percentage. This will be your grade.

Course Calendar and Exam Schedule:

Units	Date	Topic
Unit 1	August 30 – Sept 10 **Quiz Due at 11.59 PM on Sept 13th**	Introduction to Stem Cells NIH Stem Cell Primer - http://stemcells.nih.gov/info/basics/basics1.asp Stemness": Definitions, Criteria, and Standards.
Unit 2	Sept 13 – Sept 17th **Quiz Due at 11.59 PM on Sept 20th**	Embryonic Stem Cells A) PowerPoint presentation & Notes B) Early Development, - Stem Cells Scientific Progress and Future Research Direction.
Unit 3	Sept 20 – Sept 24 **Quiz Due at 11.59 PM on Sept 27th**	Pluripotency A) StemBook: Cellular and nuclear reprogramming Ch. 1 B) A New Path: Induced Pluripotent Stem Cells- Essentials of Stem Cell Biology
Exam I, Due at 11.59 PM on October 1st, Units 1, 2, and 3		
Unit 4	Sept 27 – Sept Oct 8 **Quiz Due at 11.59 PM on Oct 11h**	Molecular Bases of Pluripotency "Chapter 6: Molecular Basis of Pluripotency" - Essentials of Stem Cell Biology
Unit 5	Oct 11 – Oct 22 **Quiz Due at 11.59 PM on Oct 25th**	Epigenetics and Stem Cells StemBook: Epigenetics Ch. 2 and 3
Unit 6	Oct 25 – Oct 29 **Quiz Due at 11.59 PM on Nov 1st**	Adult Stem Cells and Stem Cell Niches A) StemBook: Renewal Ch. 3 B) Chapter 7: Stem Cell Niches - Essentials of Stem Cell Biology.
Essay Due at 11.59 PM on November 10th **Exam II, November 5th, Units 4, 5, and 6**		
Unit 7	Nov 1 – Nov 5 **Quiz Due at 11.59 PM on Nov 8th**	Hematopoietic Stem Cells A) Chapter 5: Hematopoietic Stem Cells - Stem Cells: Scientific Progress and Future Research Directions.
Unit 8	Nov 8 – Nov 12 **Quiz Due at 11.59 PM on Nov 15th**	Stem Cells and Diabetes A) Chapter 7: Stem Cells and Diabetes - Stem Cells: Scientific Progress and Future Research Directions.

		Chapter 35 and 57 from Essential Stem Cell Biology.
Unit 9	Nov 15 – Nov 19 **Quiz Due at 11.59 PM on Nov 22nd**	Stem Cells and Tissue Engineering StemBook: Tissue engineering Ch. 1, 2 and 4
Discussion Due at 11.59 PM on November 23rd **Exam III, November 29th, Units 7, 8, 9** **November 24th to November 26th Thanksgiving Break**		
Unit 10	Nov 22 – Dec 3 **Quiz Due at 11.59 PM on Dec 6th**	Stem Cells and cancer
Unit 11	Dec 6 – Dec 10 Stem Cell Ethics and Politics **No Quiz**	The Stem Cell Debate: Politics, Religion and Ethics A) The Pew Forum on Religion & Public Life Issues: Bioethics. http://pewforum.org/bioethicsm B) Chapter 67: Stem Cell Research, Religious Consideration. Essential Stem Cell Biology. PDF article in Doc Sharing.
Final Exam, Due at 11.59 PM December 13th, Monday		

*ALL DATES AND ASSIGNMENTS ARE TENTATIVE AND MAY SUBJECT TO CHANGE

Sample Study Week:
Step 1–**Download** lecture slides and supporting materials from DocSharing.

Step 2–**Critically** read chapters and supporting materials, make notes (*simply going through the materials are not going to be enough, focus on concepts, molecular mechanisms etc..*)

Step 3–**Complete** assignments if any.

Step 4–**Review material**s and your notes and participate in **office hours** to clear any questions that you may have.

Step 5–Take online **quizzes** in D2L when they are due.

Step 6–**Review again** before the test due date and take online tests.

Academic Integrity: A Texas A&M University-Commerce student does not lie, cheat, steal, and does not tolerate those who do. A violation of the Texas A&M honor code and academic integrity involves any of the following offenses: cheating, fabrication, falsification, multiple submissions, plagiarism, and complicity in any of these offenses. The first instance of cheating will results in "ZERO" on the exam and/or on the assignment. The second instance of cheating will results in "ZERO" on the course. Cheating involves copying information from another student, non-allowable materials or source and plagiarism. Once again, violations of academic integrity will not be tolerated. This class will be conducted in strict observance of the Honor Code. Refer to your Student Handbook for details.

Conduct Policy: All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. (See Student's Guide Handbook, Policies and Procedures, Conduct).

Behavior: *All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment." (See Student's Guide Handbook, Policies and Procedures, Conduct).*
http://www.tamuc.edu/academics/universityCollege/successCoaches/default.aspx

Plagiarism: Plagiarism is a criminal activity. You must cite all sources of information. Unreferenced copying of material, whether parts of sentences, whole sentences, paragraphs, or entire articles can result in a score of zero for your assignment and may result in further disciplinary action.

Piracy: *Materials provided in this course including lecture slides are copy righted and must not share them without obtaining permission.*

Students with Disabilities/Reasonable Accommodation: *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 132
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
StudentDisabilityServices@tamuc.edu

If you have not taken a course in e-College before, please use the tutorial provided for students in D2L. It will save you a lot of time and frustration and a lot faster than trial and error.

ACCESS AND NAVIGATION

D2L Brightspace Access and Log in Information

This course will be facilitated using D2L Brightspace, the learning management system used by Texas A&M University-Commerce. To get started with the course, go to myLeo and from App window select MyLeoOnline (D2L Brightspace) App. From home menu choose your course.

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: It is strongly recommended you perform a "Browser Test" prior to the start of your course.

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

Browser	Supported Browser Version(s)	Maintenance Browser Version(s)
Microsoft ® Edge	Latest	N/A
Microsoft ® Internet Explorer®	N/A	11
Mozilla® Firefox®	Latest, ESR	N/A
Google® Chrome™	Latest	N/A
Apple® Safari®	Latest	N/A

Tablet and Mobile Support

Device	Operating System	Browser	Supported Browser Version(s)
Android™	Android 4.4+	Chrome	Latest
Apple	iOS®	Safari, Chrome	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, D2Lsupports iOS 10.3.2 and iOS 9.3.5, but not

Device	Operating System	Browser	Supported Browser Version(s)
			iOS 10.2.1, 9.0.2, or any other version. Chrome: Latest version for the iOS browser.
Windows	Windows 10	Edge, Chrome, Firefox	Latest of all browsers, and Firefox ESR.

- You will need regular access to a computer with a broadband Internet connection. The minimum computer requirements are:
  o 512 MB of RAM, 1 GB or more preferred
  o Broadband connection required courses are heavily video intensive
  o Video display capable of high-color 16-bit display 1024 x 768 or higher resolution

- You must have a:
  o Sound card, which is usually integrated into your desktop or laptop computer
  o Speakers or headphones.
  o *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:
  o Adobe Reader https://get.adobe.com/reader/
  o Adobe Flash Player *(version 17 or later)* https://get.adobe.com/flashplayer/
  o Adobe Shockwave Player https://get.adobe.com/shockwave/
  o Apple Quick Time http://www.apple.com/quicktime/download/

- 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 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 or click on the words "click here" to submit an issue via email.

 the **Live Chat**

System Maintenance

Please note that on the 4th Sunday of each month there will be System Maintenance which means the system will not be available 12 pm-6 am CST.

COMMUNICATION AND SUPPORT

All e-mail received during normal business hours will be replied within 48 hrs and e-mails received during weekends will be responded on the following Monday.

COURSE AND UNIVERSITY PROCEDURES/POLICIES

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

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/registrar/documents/studentGuidebook.pdf

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/rulesProcedur es/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

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedur es/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf

Graduate Student Academic Dishonesty 13.99.99.R0.10

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedur es/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf **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 132

Phone (903) 886-5150 or (903) 886-5835

Fax (903) 468-8148

Email: Rebecca.Tuerk@tamuc.edu

Website: Office of Student Disability Resources and Services

http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServ ices/

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/rulesProcedur es/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf](http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf)

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.