

San José State University
College of Engineering, Department of Biomedical Engineering
BME 256, Biomedical Applications of Nanoplatfoms, Fall 2022

Course and Contact Information

Instructor:	Yun Wang
Office Location:	E 233I
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Email:	yun.wang@sjsu.edu
Office Hours:	Mondays and Wednesdays 2:00 - 3:00 PM (Office or Zoom: https://sjsu.zoom.us/j/83826133248?pwd=NThFNvJITGtLQjI1Z0grWEVIWGt2UT09 Password: 653868)
Class Days/Time:	Mondays and Wednesdays 6:00 - 7:15 PM
Classroom:	CL 224
Prerequisites:	BME 177, Graduate Standing, instructor consent

Web Based Material

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on canvas.

Course Description

Biomedical applications of nanoplatfoms explores the development of three cutting edge sub fields: nanoplatfoms in therapeutics; nanoplatfoms in prosthesis and implants; and nanoplatfoms in diagnosis and screening. The socioeconomic risks and solutions of nanoplatfoms in biomedical applications are also explored.

Course Goals and Learning Objectives

Course Learning Outcomes (CLO)

Upon successful completion of this course, students will be able to:

CLO 1 Describe the basic principles of nanoplatfoms in a biomedical context

CLO 2 Rationally design nanoplatfoms for cancer, cardiovascular diseases and infectious diseases

CLO 3 Rationally design nanoplatfoms for diagnostics and screening

CLO 4 List the constraints placed upon the design of various nanoplatfoms by the physiological parameters of the tissues involved

CLO 5 Successfully access the research literature related to the development of, and application of nanoplatfoms to the treatment of disease and injury

CLO 6 Effectively work in a team by in interacting with others in discussion and analysis of course topics

CLO 7 Find and critically analyze research literature and present scientific documents for discussion.

CLO 8 Deliver a professional presentation to their peers

Required Texts/Readings

Textbook

Introduction to nanomedicine and nanobioengineering, by Paras N. Prasad. ISBN : 9781118351055 ((E-book version available from the SJSU library: https://csu-sjsu.primo.exlibrisgroup.com/permalink/01CALIS_SJO/tu4ck5/alma991013664312102919)

Other Readings

Research Articles Readings from Nature Biotechnology, Nature Nanotechnology, ACS Nano, PNAS, Nano Letters, Nanoscale, Small and others

Library Liaison

Anamika Megwalu

Phone: (408) 808-2089

Email: anamika.megwalu@sjsu.edu

https://libguides.sjsu.edu/prf.php?account_id=106642

Other technology requirements

iClicker (formerly REEF Polling)

You will have several options available to participate in clicker sessions:

iClicker REEF app (iOS, Android, web app): Allows you to use your smartphone, tablet, or even laptop in class as a clicker to participate.

Clicker Remote: You can request to borrow a Clicker remote from eCampus (eCampus@sjsu.edu) for free. Remotes are to be returned to eCampus at the end of the semester.

How to set up an iClicker account and add a course

Follow the instructions available on the iClicker Reef (checklist) at

<https://www.sjsu.edu/ecampus/software-tools/teaching-tools/collaboration/iclicker.php>

Grading Policy

Determination of Grades

Reading Assignments: 20%

At least 10 quality comments per assignment in Perusall

Proposal Presentation: 20 %

Discussion: 10%

Proposal: 50%

Breakdown of Proposal:

Specific Aims: 10

Significance: 10

Innovation: 10

Approach: 20

Extra credit (iClicker): 2%

At least 75% of iClicker polls

Letter Grades

A+	> 97%
A	> 93% – 97%
A-	> 90% – 93%
B+	> 87% – 90%
B	> 83% – 87%
B-	> 80% – 83%
C+	> 77% – 80%
C	> 73% – 77%
C-	> 70% – 73%
D+	> 67% – 70%
D	> 63% – 67%
D-	> 60% – 63%
F	< 60%

University Policies

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Add/drop deadlines can be found on the current academic year calendars document on the [Academic Calendars webpage](https://www.sjsu.edu/classes/calendar/) at <https://www.sjsu.edu/classes/calendar/>. The [Late Drop Policy](https://www.sjsu.edu/aars/forms-resources/late-drops.php) is available at <https://www.sjsu.edu/aars/forms-resources/late-drops.php>. Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the [Advising Hub](http://www.sjsu.edu/advising/) at <http://www.sjsu.edu/advising/>.

Academic integrity

Your commitment, as a student, to learning is evidenced by your enrollment at San Jose State University. The [Academic Integrity Policy F15-7](https://www.sjsu.edu/senate/docs/F15-7.pdf) at <https://www.sjsu.edu/senate/docs/F15-7.pdf> requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The [Student Conduct and Ethical Development website](http://www.sjsu.edu/studentconduct/) is available at <http://www.sjsu.edu/studentconduct/>.

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments are to be completed by the individual student unless otherwise specified. If you would like to include your assignment or any material you have submitted, or plan to submit for another class, please note that SJSU's Academic Integrity Policy S07-2 requires approval of instructors.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. [Presidential Directive 97-03](https://www.sjsu.edu/president/docs/PD_1997-03.pdf) at https://www.sjsu.edu/president/docs/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the [Accessible Education Center](http://www.sjsu.edu/aec) (AEC) at <http://www.sjsu.edu/aec> to establish a record of their disability.

Student Technology Resources (Optional)

Computer labs for student use are available in the [Academic Success Center](#) located on the 1st floor of Clark Hall and in the Associated Students Lab on the 2nd floor of the Student Union. Additional computer labs may be available in your department/college. Computers are also available in the Martin Luther King Library. A wide variety of audio-visual equipment is available for student checkout from Media Services located in IRC 112. These items include DV and HD digital camcorders; digital still cameras; video, slide and overhead projectors; DVD, CD, and audiotape players; sound systems, wireless microphones, projection screens and monitors.

SJSU Peer Connections (Optional)

Peer Connections, a campus-wide resource for mentoring and tutoring, strives to inspire students to develop their potential as independent learners while they learn to successfully navigate through their university experience. You are encouraged to take advantage of their services which include course-content based tutoring, enhanced study and time management skills, more effective critical thinking strategies, decision making and problem-solving abilities, and campus resource referrals.

In addition to offering small group, individual, and drop-in tutoring for a number of undergraduate courses, consultation with mentors is available on a drop-in or by appointment basis. Workshops are offered on a wide variety of topics including preparing for the Writing Skills Test (WST), improving your learning and memory, alleviating procrastination, surviving your first semester at SJSU, and other related topics. A computer lab and study space are also available for student use in Room 600 of Student Services Center (SSC).

Peer Connections is located in three locations: SSC, Room 600 (10th Street Garage on the corner of 10th and San Fernando Street), at the 1st floor entrance of Clark Hall, and in the Living Learning Center (LLC) in Campus Village Housing Building B. Visit [Peer Connections website](http://peerconnections.sjsu.edu) at <http://peerconnections.sjsu.edu> for more information.

SJSU Writing Center (Optional)

The SJSU Writing Center is located in Clark Hall, Suite 126. All Writing Specialists have gone through a rigorous hiring process, and they are well trained to assist all students at all levels within all disciplines to become better writers. In addition to one-on-one tutoring services, the Writing Center also offers workshops every semester on a variety of writing topics. To make an appointment or to refer to the numerous online resources offered through the Writing Center, visit the [Writing Center website](http://www.sjsu.edu/writingcenter) at <http://www.sjsu.edu/writingcenter>. For additional resources and updated information, follow the Writing Center on Twitter and become a fan of the SJSU Writing Center on Facebook. (Note: You need to have a QR Reader to



scan this code.)

SJSU Counseling Services (Optional)

The SJSU Counseling Services is located on the corner of 7th Street and San Fernando Street, in Room 201, Administration Building. Professional psychologists, social workers, and counselors are available to provide consultations on issues of student mental health, campus climate or psychological and academic issues on an individual, couple, or group basis. To schedule an appointment or learn more information, visit [Counseling Services website](http://www.sjsu.edu/counseling) at <http://www.sjsu.edu/counseling>.

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Schedule is subject to change with fair notice (one week) in class or via notice on Canvas.

Course Schedule

Week	Date	Topics	Readings; <i>Deadlines</i>
2	8/22	Introduction; The syllabus	Ch.1 and 2
	8/24	Introduction	
3	8/29	Nanocarriers	Ch. 3
	8/31	Nanochemistry	Ch. 4
4	9/5	NO CLASS – Labor Day	
	9/7	Multifunctionalities for diagnostics and therapy	Ch. 5
5	9/12	Multifunctionalities for diagnostics and therapy	
	9/14	Crossing the biological barriers	Ch.6
6	9/19	Biotargeting	Ch.7
	9/21	NIH reporter Search	
7	9/26	Multimodal biomedical imaging	Ch.8
	9/28	Multimodal biomedical imaging	<i>Literature Review</i>
8	10/3	Biosensing	Ch.9
	10/5	Biosensing	<i>Specific Aims</i>
9	10/10	High-throughput multiplexed diagnostics	Ch.10
	10/12	High-throughput multiplexed diagnostics	<i>Significance 1</i>
10	10/17	Nanopharmacotherapy	Ch.11
	10/19	The human circulatory system and theranostics	Ch.12; <i>Significance 2</i>
11	10/24	Nanotechnology for cancer	Ch.13
	10/26	Gene therapy	Ch.14; <i>Innovation</i>
12	10/31	Nanotechnology for infectious diseases	Ch.15
	11/2	Rejuvenation therapy	Ch.16; <i>Approach 1</i>
13	11/7	Stem cell biotechnology	Ch.17
	11/9	Tissue engineering	Ch.18; <i>Approach 2</i>
14	11/14	Tissue engineering	
	11/16	Nanodermatology and nanocosmetics	Ch.19
15	11/21	Nanodentistry	Ch.20
	11/23	NO CLASS – Non-Instructional Day	
16	11/28	Nanotoxicity	Ch.21
	11/30	Proposal presentation	
17	12/5	Final proposal	<i>Final proposal</i>