Course Information

- **Spring 2021 NUCL 32500, Nuclear Materials Laboratory**
- CRN:
- Online lecture: Monday/Wednesday 8:30-9:20 am
  The lecture access is posted on the Announcements at Brightspace.
  Arrival on time is required.
- In-person lab sessions: Monday/Tuesday/Thursday 3:30-5:20pm, ten or less students each session.
  Teaching Assistant: Wen Jiang (graduate student of NE, jiang568@purdue.edu)
  Lab location: POTR 337.
- 3 credit hours
- Prerequisite: NUCL 320
- Course Brightspace page: https://purdue.brightspace.com

Note: Students are allowed to attend the Friday lab session if they return from the quarantine, isolation, or sick leave. Students should schedule with the TA for the Friday lab session as it is a flexible lab session and only opens based on the need.

Instructor Contact Information

- **Instructor: Dr. Yi XIE**
- Office Location: WANG 4079
- Purdue email address: xie90@purdue.edu
- Office hour: By appointment.
- You can reach the instructor via Purdue email with questions. Please add "Spring 2021 NUCL 325" on the subject line for my awareness.

Course Description

Nuclear system development is highly dependent on materials whose properties can be controlled to accommodate a wide range of applications. In the prerequisite course NUCL 320, you have acquired the fundamentals of materials science and engineering, grasped concepts of structure from bonding to microstructure, and learned to consider the interrelationships between structure and property. The purpose of this course is to present to students various materials characterization techniques and technologies, sample preparation techniques and skills, microstructures, X-ray diffraction, electron microscopy, thermodynamic property measurement, corrosion testing, electrochemical corrosion technique, tensile properties, hardness, and fracture toughness. To prepare for specific labs, students are provided with background notes tailored to the experiment to be conducted. The notes provide only background information, but do not generally detail the specific experiments to be conducted, or the procedures involved. Students are responsible for recording procedure and data, analyzing the data, and building the formal laboratory report based on the recordings.

At the end of the course, you will be able to

- Understand what materials are, and how they perform and fail.
- Understand the conceptual tools dealing with materials phenomena.
- Understand how to record procedure, data, data analysis, and write up a formal laboratory report.
- Accumulate hands-on experience of using materials analysis instruments and equipment.

On average, most students spend 2-4 hours per week working on course assignments, more or less depending on the study habits. You will succeed if you are actively engaged with the class schedule and take advantage of opportunities to communicate with the instructor and TA as well as with your classmates.

Learning Resources, Technology & Texts

- Required text: ISBN: 9781119472070 – W. Callister and D. Rethwisch, Materials Science and Engineering: An Introduction (10th edition)
  It is recommended that you get the textbook. Different editions are almost identical just organized differently. If you have the other edition already, you do not need to purchase the 10th edition.
- You can access the course via Brightspace. It is strongly suggested that you explore and become familiar not only with the site navigation, but with content and resources available for this course. See the Help tab for resources.
- Software resources: Microsoft Word. Remember that MS Office is free for all students. It is strongly suggested that you explore and become familiar with the functions (including how to insert Equation and Symbol) in Word, and complete the assignments using Word. It is recommended that you convert the Word to PDF when uploading to Brightspace.

Assignments

Assignments	Due	Percentage Weight
Quizzes (9)	Before leaving the lab	45
Lab Reports (3)	See the course schedule	45
Exam (1)	TBD	15
		Total: 105

- You are required to fully participate in the activities at the signed-up lab session. Unless with approval, you may not come at the other sessions in a week.
- It is recommended that you use MS Word to complete the Lab Reports, and convert to PDF and upload to Brightspace.
- Make-up labs, quizzes, and late lab reports will be given/accepted under the following circumstances: (1) documented illness; (2) pre-existing conflict such as conference travel or interview; OR (3) documented emergency. The grade will be zero unless these conditions are met. Other excuses are not valid.
- The instructor will read and respond to Purdue email during weekdays. You may see the instructor online occasionally on the weekends, but please don't count on it. If you have a question regarding the assignments, please send the question via Purdue email no later than noon on the due date. Questions sent after noon on the due date may not be responded.

Grading Scale

Percent Grade	Letter Grade
97-105	A+
93-96	A
90-92	A-
87-89	B+
83-86	B
80-82	B-
77-79	C+
73-76	C
70-72	C-
67-69	D+
63-66	D
60-62	D-
Below 60	F

Course Schedule

Week	Lab Session	Date
W2	Group1	Monday 1/25/2021
	Group2	Tuesday 1/26/2021
	Group3	Thursday 1/28/2021
W3	Group1	2/1/2021
	Group2	2/2/2021
	Group3	2/4/2021
W4	Group1	2/8/2021
	Group2	2/9/2021
	Group3	2/11/2021
W5	Group1	2/15/2021
	Group2	216/2021
	Group3	2/18/2021
W6	Lab Report 1	Due Friday 2/26 5pm
W7	Group1	3/1/2021
	Group2	3/2/2021
	Group3	3/4/2021
W8	Group1	3/8/2021
	Group2	3/9/2021
	Group3	3/11/2021
W9	Group1	3/15/2021
	Group2	3/16/2021
	Group3	3/18/2021
W10	Lab Report 2	Due Friday 3/26 5pm

W11	Group1	3/29/2021
	Group2	3/30/2021
	Group3	4/1/2021
W12	Group1	4/5/2021
	Group2	4/6/2021
	Group3	4/8/2021
W13	Group1	4/12/2021
	Group2	4/13/2021
	Group3	4/15/2021
W14	Lab Report 3	Due Friday 4/23 5pm
W15	Final Exam	TBD

Note: Schedule and assignments subject to change. Any changes will be posted on Brightspace. This course Stands For Wellness by voluntarily honoring the Stress Free Week. There will be no exams, quizzes, labs, nor assignments due from March 15th - 19th.

- 01/19 – Classes begin
- TBD – Last day to register without a late fee
- 02/01 – Last day to cancel a course assignment without it appearing on record
- 02/12 – Last day to withdraw a course with a grade of W
- 02/17 – Reading day
- 03/18 – Reading day
- 04/13 – Reading day
- 05/01 – Classes end
- 05/03-05/08 – Final exams
- 05/08 – Semester Ends
- 05/11 – Grades due

Open to Feedback

The instructor view feedbacks as a gift to improve the teaching skills so the instructor can serve the course and the mission better. You are welcome to provide feedbacks to the instructor, via any contact method you'd like to. Any truth, honesty and diverse perspectives for bettering the instructor and the course will be greatly valued. Even when feedback is negative, it prompts an opportunity to find out where things went wrong so that do not happen again.

Academic Guidance in the Event a Student is Quarantined/Isolated

If you must quarantine or isolate at any point in time during the semester, please reach out to the instructor via email so that we can communicate about how you can continue to learn remotely. Work with the Protect Purdue Health Center (PPHC) to get documentation and support, including access to an Academic Case Manager who can provide you with general guidelines/resources around communicating with your instructor, be available for academic support, and offer suggestions for how to be successful when learning remotely. Your Academic Case Manager can be reached at acmg@purdue.edu. Importantly, if you find yourself too sick to progress in the course, notify your academic case manager and notify the instructor via email or Brightspace. We will make arrangements based on your particular situation.

Attendance Policy during COVID-19

Students are expected to attend the regular lab session in-person unless they are ill or otherwise unable to attend class. If they feel ill, have any symptoms associated with COVID-19, or suspect they have been exposed to the virus, students should stay home and contact the Protect Purdue Health Center (496-INFO).

Students are allowed to attend the Friday lab session if they return from the quarantine/isolation/sick leave. Students should schedule with the TA for the Friday lab session as this is a flexible lab session and only open based on the need.

In the current context of COVID-19, in-person attendance cannot be a factor in the final grades. However, timely completion of alternative assessments can certainly be part of the final grade. Students need to inform the instructor of any conflict that can be anticipated and will affect the timely submission of an assignment or the ability to take an exam.

Classroom engagement is extremely important and associated with your overall success in the course. The importance and value of course engagement and ways in which you can engage with the course content even if you are in quarantine or isolation, will be discussed at the beginning of the semester. Student survey data from Fall 2020 emphasized students' views of in-person course opportunities as critical to their learning, engagement with faculty/TAs, and ability to interact with peers.

Only the instructor can excuse a student from a course requirement or responsibility. When conflicts can be anticipated, such as for many University-sponsored activities and religious observations, the student should inform the instructor of the situation as far in advance as possible. For unanticipated or emergency conflicts, when advance notification to an instructor is not possible, the student should contact the instructor/instructional team as soon as possible by email, through Brightspace, or by phone. In cases of bereavement, quarantine, or isolation, the student or the student's representative should contact the Office of the Dean of Students via email or phone at 765-494-1747. Our course Brightspace includes a link to the Dean of Students under "Campus Resources".

Classroom Guidance Regarding Protect Purdue

The Protect Purdue Plan, which includes the Protect Purdue Pledge, is campus policy and as such all members of the Purdue community must comply with the required health and safety guidelines. Required behaviors in this class include: staying home and contacting the Protect Purdue Health Center (496-INFO) if you feel ill or know you have been exposed to the virus, properly wearing a mask in classrooms and campus building, at all times (e.g., mask covers nose and mouth, no eating/drinking in the classroom), disinfecting desk/workspace before and after use, maintaining appropriate social distancing with peers and instructors (including when entering/exiting classrooms), refraining from moving furniture, avoiding shared use of personal items, maintaining robust hygiene (e.g., handwashing, disposal of tissues) prior to, during and after class, and following all safety directions from the instructor.

Students who are not engaging in these behaviors (e.g., wearing a mask) will be offered the opportunity to comply. If non-compliance continues, possible results include instructors asking the student to leave class and instructors dismissing the whole class. Students who do not comply with the required health behaviors are violating the University Code of Conduct and will be reported to the Dean of Students Office with sanctions ranging from educational requirements to dismissal from the university.

Any student who has substantial reason to believe that another person in a campus room (e.g., classroom) is threatening the safety of others by not complying (e.g., not properly wearing a mask) may leave the room without consequence. The student is encouraged to report the behavior to and discuss the next steps

with their instructor. Students also have the option of reporting the behavior to the Office of the Student Rights and Responsibilities. See also Purdue University Bill of Student Rights.

Academic Integrity

Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either emailing integrity@purdue.edu or by calling 765-494-8778. While information may be submitted anonymously, the more information is submitted the greater the opportunity for the university to investigate the concern. More details are available on our course Brightspace table of contents, under University Policies.

Nondiscrimination Statement

Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life. More details are available on our course Brightspace table of contents, under University Policies.

Accessibility

Purdue University strives to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let the instructor know so that we can discuss options. You are also encouraged to contact the Disability Resource Center at: drc@purdue.edu or by phone: 765-494-1247. More details are available on our course Brightspace under Accessibility Information.

Mental Health Statement

If you find yourself beginning to feel some stress, anxiety and/or feeling slightly overwhelmed, try WellTrack. Sign in and find information and tools at your fingertips, available to you at any time.

If you need support and information about options and resources, please contact or see the Office of the Dean of Students. Call 765-494-1747. Hours of operation are M-F, 8 am- 5 pm.

If you find yourself struggling to find a healthy balance between academics, social life, stress, etc. sign up for free one-on-one virtual or in-person sessions with a Purdue Wellness Coach at RecWell. Student coaches can help you navigate through barriers and challenges toward your goals throughout the semester. Sign up is completely free and can be done on BoilerConnect. If you have any questions, please contact Purdue Wellness at evans240@purdue.edu.

If you're struggling and need mental health services: Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help, such individuals should contact Counseling and Psychological Services (CAPS) at 765-494-6995 during and after hours, on weekends and holidays, or by going to the CAPS office of the second floor of the Purdue University Student Health Center (PUSH) during business hours.

Emergency Preparation

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. Relevant changes to this course will be posted onto the course website or can be obtained by contacting the instructor via email or phone. You are expected to read your @purdue.edu email on a frequent basis.