

ENGR103: INTRODUCTION TO NUCLEAR ENGINEERING IN PRACTICE

Mon: 1:30pm-2:20pm @ PHYS 201

Catalog Description: 1 cr. hr. Weekly small group seminars led by nuclear engineering faculty to introduce a specific topic, problem, or discipline of nuclear engineering to First-Year Engineering (FYE) students. Seminars are designed to help students explore nuclear engineering and/or to assist in their decision of selecting nuclear engineering as a major.

Course Objectives: To acquaint FYE students with Nuclear Engineering as a major, including technical areas of study, wide range of applications in practice, and impact to the society, climate and environment.

Prerequisites: None

Faculty-in-charge: Dr. Seungjin Kim, Professor and Head of Nuclear Engineering
Email: seungjin@purdue.edu
Office Hours: By appointment

Guest Faculty: Dr. Hany Abdel-Khalik, Associate Professor, Nuclear Engineering
Dr. Hitesh Bindra, Associate Professor, Nuclear Engineering
Dr. Stylianos Chatzidakis, Assistant Professor, Nuclear Engineering
Dr. Allen Garner, Associate Professor, Nuclear Engineering
Dr. Martin Lopez-De-Bertodano, Associate Professor, Nuclear Engineering
Dr. Rusi Taleyarkhan, Professor, Nuclear Engineering
Dr. Lefteri Tsoukalas, Professor, Nuclear Engineering
Dr. Xiaoyuan Lou, Associate Professor, Nuclear Engineering
Dr. Shripad Revankar, Professor, Nuclear Engineering
Dr. Yi Xie, Assistant Professor, Nuclear Engineering

Textbook: No textbook. References are to be made available via BrightSpace.

Course Policies:

- Course policies will be strictly observed as part of maintaining integrity of the course.
- Attendance is mandatory. A more detailed guideline is given below.
- Assignment:
 - A brief summary report (**less than 100 words**) summarizing the lecture in a given template.
 - The completed report needs to be submitted to BrightSpace **in PDF file** within one week following the lecture.
 - The file name should be formatted to **Lastname,FirstInitial_LectureDate** (e.g., Kim,S_0822).
 - **No late submission** will be accepted.
 - Two assignments with lowest score will be dropped from calculating the final score.
- Course Materials:
 - Any course materials including the lecture slides and reference materials are intended only for authenticated users who are enrolled for ENGR103. Release of

course material to any other people without obtaining written consent from the instructor will be regarded as a violation of academic integrity.

- Recording, photographing, and releasing of the lecture materials to the public domain without instructor's written consent are prohibited and will be regarded as a violation of academic integrity.
- Grade Proportion
 - Summary report: 80%.
 - Attendance: 20%
 - The grade will be partitioned as shown in the Table below:

Final Avg. Score	Grade
$90 \leq \text{Avg.}$	A
$80 \leq \text{Avg.} < 90$	B
$70 \leq \text{Avg.} < 80$	C
$60 \leq \text{Avg.} < 70$	D
$\text{Avg.} < 60$	F

Extenuating circumstances:

Exceptions may be considered for exams and homework assignments under some limited extenuating circumstances, such as: official Purdue approved activities; military obligations; religious observances; government duties; personal reasons beyond his/her control etc. In such cases, students are required to provide the instructor with proof of evidence prior to the expected absences. For the official university policy, refer to: http://www.purdue.edu/studentregulations/regulations_procedures/classes.html

Academic Integrity

Academic integrity is one of the highest values that Purdue University holds. Information on Purdue's policies with regard to academic misconduct can be found [here](#). 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.

Attendance

In accordance with University policy, students are expected to attend all the classes. Students who miss classes are expected to be responsible for material discussed during the missed lectures. If a student has a valid reason for missing class such as a University-sponsored activity, religious observances, illness, or family emergency, you need to inform the instructor in writing regarding your absence in advance. Students who fail to attend class without a valid excuse should not expect the instructor to supply class notes or provide special help. The official university policy can be found [here](#).

In the current context of the COVID-19, students must follow the guidelines in the [Protect Purdue Pledge](#). Most specifically, students must refrain from attending class if they are exhibiting any symptoms of COVID-19, are otherwise ill, or are quarantined or isolated. Students should stay home and contact the Protect Purdue Health Center (496-INFO) if they feel ill, have any symptoms associated with COVID-19, or suspect

they have been exposed to the virus. In the current context of COVID-19, in-person attendance will not be a factor in the final grades, but the student still needs to inform the instructor of any conflict that can be anticipated and will affect the submission of an assignment or the ability to take an exam. 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 conflict, when advance notification to an instructor is not possible, the student should contact the instructor as soon as possible by email, through Brightspace, or by phone. When the student is unable to make direct contact with the instructor and is unable to leave word with the instructor's department because of circumstances beyond the student's control, and 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.

If you become quarantined or isolated at any point in time during the semester, in addition to support from the Protect Purdue Health Center, you will also have access to an Academic Case Manager who can provide you academic support during this time. Your Academic Case Manager can be reached at acmq@purdue.edu and will provide you with general guidelines/resources around communicating with your instructors, be available for academic support, and offer suggestions for how to be successful when learning remotely. Importantly, if you find yourself too sick to progress in the course, notify your academic case manager and notify me via email or Brightspace. We will make arrangements based on your particular situation. The Office of the Dean of Students (odos@purdue.edu) is also available to support you should this situation occur.

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 prior to 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 wearing a mask) may leave the room without consequence. The student is encouraged to report the behavior to and discuss 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](#)

ENGR103 LECTURE SCHEDULE*This schedule is tentative and subject to change*

Week No.	Date	Topics	Faculty Instructors
1	08/22	Overview of the Course / Nuclear engineering	Kim
2	08/29	Femto-to-Macro scale engineering applications of nuclear technologies	Taleyarkhan
3	09/05	Labor Day Holiday	No Class
4	09/12	How nuclear power reactors work / Global energy demand and nuclear energy	Kim
5	09/19	The role of AI and ML in nuclear engineering	Tsoukalas
6	09/26	Radiation detection and nuclear security/non-proliferation	Chatzidakis
7	10/03	Intense electromagnetic radiation and biological applications	Garner
8	10/10	October Break	No Class
9	10/17	PUR-1 Tour and digital I&C	Chatzidakis / Miller
10	10/24	Renewable and nuclear as green energy	Revankar
11	10/31	Nuclear power systems and nuclear hybrid	Bindra
12	11/07	Nuclear advanced manufacturing	Lou
13	11/14	Topics in nuclear reactor safety	Lopez-De-Bertodano
14	11/21	Nuclear materials	Xie
15	11/28	Nuclear cyber-security	Abdel-Khalik
16	12/05	Nuclear engineering as a major	Student Leaders / Academic Advisor / Kim
17	12/12-16	Final Exam week	No class