NE 406 FALL 2019
Senior Design Prep -- All Sections -- Coordination Syllabus
Room 327 Daniels Hall (DELTA Classroom)
(Distance Ed DELTA Classroom fully interactive class with SCSU participating students)

Class Coordinator: **Dr. Mohamed Bourham (bourham@ncsu.edu)**
Office: 1122 BEL **Phone:** 515-7662 **FAX:** 515-5115
Coordination T/As: Ms. GhadaGhada Shkoukani Al-Qous gyshkouk@ncsu.edu
MR. Sean Kerrigan spkerrig@ncsu.edu

All TAs will work with the class coordinator for the general arrangements and class logistics

Please carefully read the entire document for important information

Class Meetings:

1. **Meetings with Dr. Bourham**:
   The all-sections meeting with the coordinator (M. Bourham) will be **WEEKLY** as we have 7 sections. Will be able to have 4 sections presenting in one week followed by the other 3 sections presenting the following week, hence, it is still a bi-weekly presentation for each team BUT a weekly meeting for the entire class. **ALL TEAMS MUST attend the weekly meeting**.

   The all-sections meeting will be in Distance Education **DELTA Classroom 327 Daniels Hall**

   Scheduled for Mondays starting Monday August 26th, 6:00-7:50PM, the first meeting is for the class coordinator to introduce the projects and discuss any logistics.

   Each following meeting will have 20 to 25 minutes per team to present their design progress. We will group sections 001, 003, 005 and 007 for one week, and 002, 004 and 006 for the following week.

2. **Meetings with Project Advisers**: Each section will meet with the section's instructor on a schedule to be determined by the instructor. **All sections should immediately start meeting with their respective project adviser(s).**
   South Carolina State University students have a monthly meeting at NCSU Campus with the team of their respective section. The schedule for SCSU students will be 4 on-campus meetings as follow:
   1. **Sept. 13 –14, 2019**
   2. **Oct. 18 – 19, 2019**
   3. **Nov. 8 – 9, 2019**
   4. **Dec. 6 – 7, 2019**

Syllabus

This syllabus is the general class syllabus for all sections. Details of the design contents and requirements will be provided by the section instructor. All sections have Industry or National Lab adviser(s.)

Objectives:
- Provide preliminary design phase in nuclear engineering systems to prepare for the final design phase.
- Enhance understanding of design process.
- Integrate technical information learned in other courses, and engineering design ethics, into design process.

- Develop analytical skills supportive of design process: 'Iterative techniques', 'Investigation of alternatives', 'Optimization techniques', 'Economic evaluations' and 'Cost-benefit analysis'.
- Understand, and master, the use of specific codes for simulation and numerical techniques.
- Provide design team experience, leadership and integrated efforts.
- Develop oral and written communication skills for technical matters.

Description:

-Preliminary designs developed by teams with advice of faculty, with reports presented in oral and written form. Current and future systems emphasized, and use of computers is highly encouraged

-Project teams must meet regularly with the project advisor(s).

-Regular periodic meetings each Monday for all sections are essential for successful completion of the project, and a wide-range of understanding of the other projects by other teams.

- A schedule of the coordinator's meetings (and other important schedules) is provided on the last pages of the syllabus.

-Class meetings with course coordinator (M. Bourham) have the following objectives:

1) **Giving each team an opportunity to discuss their project independent of their direct project advisor. The coordinator provides critique to all teams.**
2) **Giving the students the opportunity to become acquainted with all projects, exchanging ideas and in-class critique; and an opportunity for the students to peer each other.**

-The entire class will meet with the class coordinator once each week on Monday to present progress on the design project to the class coordinator. All presentations will be in PowerPoint. A copy of the presentation **MUST** be electronically delivered to the class coordinator prior to the class meeting as well as a copy to the respective section's instructor.

Special Notice:

Please notify the class coordinators and the project advisor(s) about any special requirements that you might need (e.g. any form of disability) so we can arrange for you.

Grading: This is 1.0 Credit hour Prep. Design Activity, which is Phase I for the fall semester. Grading will be based on the instructor's evaluation of the technical work and the individual contribution of each team member, participation, overall performance in the design work, and the overall joint group achievement.

Generally:

- (60%) Individual contribution to the goals of the project preparation phase, specifically, understanding of the system design requirements, contribution to design conceptualization, analysis tools identification and introductory use, ability to exercise basic functions of the analysis tools identified,
- (40%) Participation in team meeting, discussion, and delivering on tasks assigned by the team lead. The evaluation will account for team peer-to-peer evaluation.

However, above is the general criteria **BUT** the instructor of each section may modify it as per the instructor's own grading rubric, and will inform his/her section of such modification.

Class Policies:

-Regular attendance in all class presentations is **required**.
-NO violations of academic integrity will be tolerated; a (**F**) will be the result of violation.
-All students are required to follow NCSU academic regulations.
http://www.ncsu.edu/uap/resources/beg_of_semester.htmlhttp://policies.ncsu.edu/category/academic-affairs

Section 001
Adviser: Dr. Scott Palmtag
Sponsored by: Idaho National Lab (Dr. Youssef Ballout)
"***Design of a Molten Salt Reactor***"
Design Team: Goodman,Charles; Novellino,Vincent; Verrico,Lindsay; Thomson,Thomas J. (SCSU)

Section 002
Adviser: Dr. Jason Hou
Sponsored by: Framatome (Dr. Mike Savela)
"***Core Optimization Comparison between FORMOSA's Native Solver and PRISM***"
Design Team: Crozier,Jonathan; Hartwell,Patrick; Meehan,Nick; Manhardt, Amelia M. (SCSU)

Section 003
Adviser: Dr. Xu Wu
Sponsored by: GE Power (Drs. John Zino / Glen Watford)
"***Neutron Absorber Studies for HTGR Micro-Reactor Concept***"
Design Team: Klemes,Johnny; Montz,Blake Robert; Sullivan,Kaitlyn

Section 004
Advisers: Drs. Maria Avramova and Kostadin Ivanov
Sponsored by: Westinghouse (Mr. Baxter Durham)
"***High-Enrichment/High-Burnup Loading Pattern Optimization for a 3-Loop Westinghouse PWR***"
Design Team: Cohen,Justin; Zakaib,Mohsen; Harglerode,James A. (SCSU)

Section 005
Advisers: Drs. Kostadin Ivanov and Maria Avramova
Sponsored by: Westinghouse (Mr. Baxter Durham)
"***High-Enrichment/High-Burnup Loading Pattern Optimization for a 2-Loop Westinghouse PWR***"
Design Team: Gozum,Chris; McNeil,Spencer; Toronka,Amadu

Section 006
Advisers: Drs. Djamel Kaoumi
Sponsored by: GE Power (Russ Fawcett and W. Patrick Davis)
"***Accident Tolerant Fuel Coating Methods for Fuel Rod Inner Surface***"
Design Team: Carlson,Robert; Joslin,Nick; Truong,Liam,; Gentile,Robert O. (SCSU)

Section 007
Advisers: Dr. Benjamin Beeler
Sponsored by: Savannah River National Lab (Drs. Tracy Stover, Nicholas Bridges and Ms. Tara Smith)
"***Reactor Modeling of each Mark-18A Target in SRS's K-Reactor during Californium Production Campaign***"
Design Team: Austin,Ben; Brinkley,Cade; Weinberg,Jacob Andrew; Jeffcoat, Jennifer Elizabeth F. (SCSU)