Projects for Engineering Systems Course: Spring 2012

Students are asked to form teams and choose ONE Large Engineering Project, listed below and follow the following guidelines for an effective outcome of the project.

1. Each Team will identify a set of Sub-systems (min. of 4 per project). Each Project will be taken up by ONLY ONE Team and every one of the students should be part of any one team. A Project team will have a min. of 20, and a max. of 25 students.
2. Each Sub-system will have 3 to 5 students as the Sub-system team members and will choose/elect one of them as the leader of the sub-system (SSL). The sub-system can be arrived at during/after brainstorming sessions with the respective Faculty/TA Mentors.
3. Each Team will also elect a Team Leader (TL) and an Alternative Team Leader (ATL) from among themselves
4. Every Project will have Faculty and TA Mentor/s and the Team's progress will be evaluated by them. Teams will periodically meet within themselves and with the Faculty/TA Mentor to discuss the problem, ideas, approaches/design/protocols, and solutions/results with their respective Faculty/TA Mentor/s

Project List

1. Project Title: Rural Water and Sanitation System in India
   Objective/Expectations: Water for drinking and other basic needs and Clean Sanitation is still a faraway dream for many villages in the country. A local sustainable water supply system is needed along with a manageable sanitation system for these rural regions.
   Faculty: Rajan TA: Abhishek and Anuj Toshniwal

2. Project Title: Airport (Brownfield) Development
   Objective/Expectations: The current Airport can handle about 3lakh passengers a year, and a new airport for 30Lakh passengers a year has to be built at the same place, without disrupting current operations and a smooth transition to the new one.
   Faculty: Rajan TA: Manushree

3. Project Title: Waste management and handling in an urban centre
   Objective/Expectations: Assessment of different methods in managing/treating municipal and industrial waste to reduce soil and ground water contamination
   Faculty: Neelima Satyam TA: Medha and Simpi

4. Project: Driver-less car from Kashmir to Kanyakumari
   Objective/Expectations: The objective of this project is the design of the required subsystems for an automated car drive from Kashmir to Kanyakumari. The car should in principle be capable of running between any two destinations in the country, without manual intervention or control, making use of various sensing/information modalities including Google maps, satellite imagery apart from regular onboard sensors

Faculty: Madhav K TA: Nikhil Soni

5. Project Title: Disruption of economy due to earthquake disaster
   Objective/Expectations: Scenario development to help government
   Faculty: Pradeep K R TA: Rahul Tiberwal

6. Project Title: Retrofitting scheme
   Objective/Expectations: Plan for promotion of seismic strengthening
   Faculty: Pradeep K R TA: Narender

7. Project Title: Designing a single family net zero energy house
   Objective/Expectations: Design a single family house so that the net annual energy consumption of the house is zero. Students can take city of their choice. They should do energy simulations to estimate the energy consumption and comfort in the house. The PV should not be more than 1kW(peak) and the battery has to be sized carefully. Assume typical equipment and area requirements for a single family home.
   Faculty: Vishal Garg TA: Mahesh Goud

Deadlines for the different Stages

All reports have to be submitted in PDF Format.

1. Feb 15th (Wed) – Submit the "Project Members and Organization Chart"

This Report will contain – the System project with name of TL, ATL, Sub-systems with SSLs and members list

Students will report which large project they have choosen; discuss among themselves and LIST the 1st level sub-systems; organize themselves as part of one Sub-system with each Sub-system group having 3 to 5 students. Also, elect a leader for the entire project. They can make this list in discussion with the Faculty Mentors – fix your preferable meeting dates with TAs and Faculty Mentors

In addition to the list of sub-systems and names of the respective team members, we would also need a 1-2 liner on each sub-system. This 2 liner is more like what this sub-system will deliver/do (similar to the overall system objective/expectation/outcome that was stated). This will help us understand your sub-system level design.

[optional] Input to and output of these sub-systems - this is more like your first guess-estimate [For eg., Output of A is Input of B]

AND use the Following format to submit your files -

Keyword_ReportName(ver#).pdf

(ver#) - Version numbers are optional, like (ver1), (ver2), etc

Report Names are -

SS-Chart : Subsystem list and Organization chart

PDR: Preliminary Design Review
CDR: Critical Design Review
Presen : Presentation file

2. March 3rd (Sat) –Preliminary Design Review (PDR)
3. Feedback from Faculty Mentors and TAs
4. Apr 7th (Sat) - Critical (also Complete) Design Review (CDR)
5. Apr 11th (Wed), 14 (Sat) - System Design Presentation - Each Large project gets a max. of 20mins

Marking for the Project is as follows –
PDR - 20%
CDR - 20%
Presentation - 20%
Discussions with the Mentor - 40%