Realising a project with the Industrial Process and Energy Systems Engineering Group

Goals Rules, Contract

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IPESE - Industrial Process and Energy Systems Laboratory
IGM - Institute of Mechanical Engineering
STI - School of Engineering
EPFL - Ecole Polytechnique Fédérale de Lausanne
Switzerland

September 20, 2013
1 Motivations
- Importance of projects in your curriculum
- What do we propose?

2 A Pedagogical contract
- What can you expect from our side?
- What is expected from your side?

3 Workflow
- The project workflow?

4 Evaluation
Outline

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4 Evaluation
Projects represent up to 50% of the master program

The projects have the goal of developing your skills in:

- Activating your knowledge for solving engineering problems
- Placing a problem in its context
- Managing a project and working in a team
- Activating your creativity for problems solving
- Producing and analysing results
- Communicating Science and Techniques

When proposing projects, we challenge YOU as future engineer in the field of energy ... there is no known solution
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Industrial Process and Energy systems Engineering group (IPESE) is proposing projects that are related with its research activities, where appropriate the projects are also linked with our partners (industry, universities,...).

*We challenge you as young engineers that have to solve a practical problem*

- The integration with our research project teams (project leader → Researcher → Master student)
- Timely problems from our research topics
- A pedagogical contract
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Projects are realised under the supervision of LENI researchers and when possible in collaboration with LENI partners. We offer:

- Expertize
- Orientations and hints
- Feedback on received documents
- Support for using the tools
- Motivated and passionate team working environment (hopefully)
Team working

- Student are integrated in our research teams
  - Team working
  - Synergies between researchers and students
  - Constraints: (e.g. time, availability)
- Researchers will present their projects (context definition)
- Prepared documentation, materials, tools and experiments
Documents

Download at http://ipese.epfl.ch → Student projects

- How to write a report?
  - Books R. Turton et al.
  - Student Summary (S Baumann)
- How to make an oral presentation?
  - Documentation by craft.epfl.ch
- Project realisation directive
  - This presentation
  - Rules and guidelines
  - Some template documents
  - Self-evaluation Sheet (Quality control)
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What is expected from your side?

We challenge you with a project and we expect your

- Enthusiasm and involvement
- Professionalism and team working attitude
  - Autonomy
  - Creativity
  - Responsibility
  - Communication
- Time and quality control
- High quality report
- Follow project realisation rules and guidelines
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The project team

Projects are organised by thematics and the students are informed of the progress in their respective thematics.

Project team is composed of at least 3 persons:

- The student
- The project leader (Assistant)
  - A project is allocated to an activity with several assistants
- The evaluator (another assistant)
- The professor
### Motivations

A Pedagogical contract

### Workflow

The project workflow?

### Evaluation

The project timeline

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#### Major Milestones and Deliverables

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Date</th>
<th>Deliverable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goals and Work planning</td>
<td>Week 3</td>
<td>Blog report</td>
</tr>
<tr>
<td>Report content proposal</td>
<td>~ Week 7</td>
<td>Blog + pdf</td>
</tr>
<tr>
<td>Oral presentation</td>
<td>Week 11</td>
<td>Slides</td>
</tr>
<tr>
<td>Final report</td>
<td>10.01.2014</td>
<td>Report</td>
</tr>
</tbody>
</table>

Documents will receive feedback from the project leader
Define the goals & Context

From the definition of a challenge, you will be asked to define the project goals

- Define the context of the project
- Stating the problems to be solved
- Define the expected deliverables
  - Report, drawings, tables,...
  - Experimental set-up
  - Computer programs, data bases,...
- Identifying knowledge, methods and tools to be used
  - Define also the resources needed (persons, computers, labs,...)
Work planning

- List and description of tasks
- Who is doing what? What are the interactions with the others?
- Gantt chart
- Define Milestones and deliverables
- Fix the intermediate meeting date (~ week 8)

### Milestones and Deliverables

<table>
<thead>
<tr>
<th>Del 1</th>
<th>Project objectives and planning</th>
<th>~ week 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter</td>
<td>Introduction and objective</td>
<td>~ week 7</td>
</tr>
<tr>
<td>Annex</td>
<td>Project schedule</td>
<td>end</td>
</tr>
</tbody>
</table>
Structure the information

- Bibliography search
  - Not only google!
- Definition of the required data
- Collection of the data
- Form of the required data
- Reporting of the data collection

Expected Deliverables

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Bibliography and references</th>
<th>~ end</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter</td>
<td>Annexes/data bases/doc programs</td>
<td>~ end</td>
</tr>
</tbody>
</table>
Solve the problem

- State the problem and installed the required tools/devices
- Document the tests and actions
- Prepare the data for reporting
- Be precise and rigorous

Expected Milestone

<table>
<thead>
<tr>
<th>Del 2</th>
<th>Report structure</th>
<th>~ week 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter</td>
<td>Method and tools</td>
<td>~ end</td>
</tr>
</tbody>
</table>
Analyse and report the results

- Prepare graphics and tables
- Evaluate errors
- Sensitivity analysis
- Communicate the results to your supervisor
- Report your results
- Draw conclusions (synthesis and critics) and recommendations on future works

Expected Deliverables

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Results analysis</th>
<th>end</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter</td>
<td>Conclusion and recommendations</td>
<td>end</td>
</tr>
</tbody>
</table>
How is the project evaluated?

- Project evaluation criteria
  - Adapted as a function of the project level
  - Defined in a evaluation grid
  - You will receive a feedback

- Auto-Evaluation
  - You are the first responsible of the quality control
  - Auto-evaluation grid (see supporting material)

- Project realisation
  - Working plan
  - Milestones
  - Results
Project evaluation Criteria

6 Criteria - 10 pts each

1. Problem statement
   - Context, State of the art
   - Goals formulation

2. Work realisation
   - Autonomy - Creativity
   - Tools and methods
   - Quality

3. Quality of the results and results assessment
   - Synthesis of the results
   - Presentation (Graphs, drawings)
   - Recommendations and critics

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Project evaluation Criteria cont.

1. Report (external examiner)
   - Structure
   - Tables and Graphs
   - Bibliography
   - Clarity

2. Presentation (external examiner)
   - Oral presentation
   - Q&A

3. Personal Involvement in the work
   - Constancy
   - Effort
Final Remark

Project leaders are also doing research!

- Respect researchers work
- Support is time consuming
  - Use of http://leniwiki.epfl.ch
  - Fill leniwiki when you receive a "how-to" information
  - Share your knowledge
- High density of researchers → discussion outside the office
- Do not hesitate to ask for meeting when needed (and prepare it)
- Follow administrative guidelines
- Keep your planning, i.e. start working now!
Thank you for your attention

Enjoy your project...

Any Questions?