

Workshop II

Engineering curriculum design

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Structure of Guidelines for Engineering Curricula Design: a proposal

1. Trends in Engineering Curriculum Design

- *Outcomes-based approach*
- *National and European Qualification Frameworks*
- *National and International requirements for graduates' competencies (FES, EUR-ACE Framework Standards)*

Discussion

- Start: Not discussed about content first, need to discuss general roles

What are the stakeholders, for whom we create it, what are the goals

- Is there a market need (for industry, society or science carrer)
- Germany - Make a survey whether the market needs the graduates
- Russia: university in co-operation with their partners decide what they want to introduce

Current Frame: How can you define the new profile of the programme? It has to fit into the university profile...what are the Bologna, state and university regulations (frame for establishing the new course)

- Programme should be sustainable (financial, number of grauduates)

- Frame in Russia: survey the regional industry, **university needs licence** from ministry of education, have to submit proposal for getting permission
- Request from industrial partners – most important for developing new programmes
- Gap in the set of requirement from industry and set of appropriate professors at the university – that's why create a programme with partners (international, double degree)
- improving the mobility of the students is one priority of the new course

Curriculum design

- Have to **define the learning outcomes** with the stakeholders (companies)
- St. Petersburg: important: how long they are at the university, how long in industry
 - Need to think about the staff we have, than we can create the content

- Erik: You have to change the mind of the prof.s or you have to change the prof.s for creating a new course
- Regulation in Russia: there are special requirements concerning the subjects given by the government (competences, credits, structure (research, thesis, technical, humanities))
- Erik: Application to the accreditation system at first, that you are able to establish the course, that it is relevant to the industry...
- if they are accepted by the system they will be accredited after introduction

- Accreditation: actually no accreditation is demanded by start of the programme, BUT after first graduates of the programme they have to make the accreditation to a federal accreditation system
- Professional accreditation is an add on but quite useful for the university because there are very clear criteria – good practice

Create Set Programme Goals/Outcomes

To keep in mind:

- Have to consider Educational standards, stakeholder
- Sustainability and the history of the programme
- Outcomes depends on the targets of the course designer
- to ensure that cross-disciplinary and subject-specific quality standards are maintained when new degree programmes are introduced

- to promote the diversity, quality and transparency of degree programmes

Teaching and learning methods

- Have to keep in mind that every student is different in his learning behavior
- How to create methods that fit to most
- Use of ICT
- Russia: There are some federal recommendations, at Master level: 70 % active learning methods and 30 % lectures
- There are still internal regulations at each university
- How to evaluate the achievements?

- Alumni: compare the achievements by the graduates with observations by the industry – adaptation of the programme
- Track the career, alumni meeting, sponsorship
- They are the stakeholder for improving the curricula
- Outcome based approach – how to measure it (competences)
- When the industry like to take the graduates that we have well done

Suggestions for the working group to design engineering curriculum

- Discussion with stakeholder
- To follow the frames/environment/regulations
- Definition of the programme goals and outcomes
- Deciding about learning and teaching methods
- Decide about the content/subjects
- Creating the Syllabus, modul handbook, ECTS
- Create evaluation tool and criteria
- How to deal with the graduates/alumni?
- Continuously evaluation of the programme
(Stakeholders, Alumni, etc.)