Teaching Project Management at different levels of study

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Introduction

- Undergraduate study
  - Management in Engineering
  - Software Design Project
- Graduate study
  - Project
  - Project Management
- Doctoral study
  - Project Management and Doctoral Research
- Postgraduate specialist study
  - curriculum

Management in Engineering

- Undergraduate study: 2. sem
- ECTS credits: 3
- Study hours: 30 (15 * 2)
- Students: 700++
- Lecturers: 5

- Course Description
  - … to gain knowledge on business, legal, and project engineering environment

- Main topics:
  - engineering profession,
  - engineering ethics,
  - intellectual property,
  - engineering approach to problem solving,
  - teamwork,
  - projects and PM,
  - project planning,
  - risks in projects,
  - management and managers,
  - organizing and leadership.

Management in Engineering (grading)

- Lectures: 7 + 6 in 2 cycles
- Exams: written
- Seminar: small project plan
- Tests: 2 computer based

Grading	
Acceptable (2)	50
Good (3)	62
Very Good (4)	74
Excellent (5)	86

Grading System

Type	Continuous Assessment		Exam	
	Threshold	Percent of Grade	Threshold	Percent of Grade
Class participation	0 %	10 %	0 %	10 %
Seminar/Project	0 %	30 %	0 %	30 %
Mid Term Exam: Written	0 %	30 %	0 %	
Final Exam: Written	0 %	30 %		
Exam: Written			0 %	60 %

[Software Design] Project

- Undergraduate (5. semester) & graduate study (3. semester)
- ECTS credits: 8, Study hours: N/A
- Team work on R&D project
  - finding the literature,
  - analysis of similar problems,
  - identification of requirements,
  - definition of technical objectives,
  - planning and time management,
  - creation of alternative solutions,
  - decision making,
  - solution implementation,
  - writing technical documentation
- Schedule by weeks
  - 01-01 Mentor assignment
  - 02-02 Team forming
  - 03-05 Work on project
  - 06-06 Project plan submission
  - 07-10 Work on project
  - 12-12 Submission of final work
  - 13-13 Project presentation
  - 14-15 Project evaluation

[Software Design] Project (cont'd)

- Groups of 6 to 8 students
  - may be joined of subgroups of more than one mentor
  - may be joined of ***m*** individuals on ***n*** projects for the same mentor
- Teams guided by teaching staff
  - by schedule or sporadically
  - projects more/less transparent
- Mentor assigns max 100 pts/std
  - 60 points – deliverables
  - 30 points – organization
  - 10 points – presentation
- Team leader (student) distributes points to the group
  - discretionary, or
  - based on mentor's decision

Grading	
Acceptable (2)	50
Good (3)	60
Very Good (4)	75
Excellent (5)	90

Project management

- Graduate study, 3. semester
- ECTS credits: 4
- Study hours: 30 (15 * 2)
- Students: cca 80-200, avg 120
- Lecturers: 2, Assistants: 2-3

- General Competencies (short)
  - Project definition, teamwork, project life cycle, skills in project planning and management

- Schedule by weeks
  1. Project management fundamentals.
  2. Project management context.
  3. Project life cycle, basic processes and process groups.
  4. Project initiation.
  5. Project planning.
  6. Project scheduling.
  7. Invited lecture.
  8. Mid-term exam.
  9. Project execution. Project monitoring and control.
  10. Human resources management.
  11. Decision making. Delegating. Conflict management.
  12. Communications management. Negotiating.
  13. Project recovery. Project closing. Lessons learned.
  14. Invited lecture
  15. Final exam

Project management - grading

- Lectures: 7 + 6 in 2 cycles
- Exams: mid exam, final exam, tests
- Homework: proposal, plan, review

Grading	
Acceptable (2)	50
Good (3)	65
Very Good (4)	80
Excellent (5)	90

Grading System

Type	Continuous Assessment		Exam	
	Threshold	Percent of Grade	Threshold	Percent of Grade
Homeworks	0 %	15 %	0 %	15 %
Quizzes	0 %	30 %	0 %	30 %
Class participation	0 %	5 %	0 %	5 %
Attendance	0 %	5 %	0 %	5 %
Mid Term Exam: Written	0 %	20 %	0 %	
Final Exam: Written	0 %	25 %		
Exam: Written			0 %	45 %

Project management - statistics

Year	Enrolled	Passed	Passed %	Avg. Grade	Erasmus
2009/10	110	110	100,00%	3,65	
2010/11	196	194	98,98%	3,50	
2011/12	112	102	91,07%	3,56	2
2012/13	97	93	95,88%	3,55	1
2013/14	142	135	95,07%	3,63	7
2014/15	88	84	95,45%	3,58	6
2015/16	89	84	94,38%	3,59	9
2016/17	79	71	89,87%	3,53	4
2017/18	136				14
average	**117**	**109**	**95,09%**	**3,57**	**6**

Doctoral Study

(PhD as a Project)

Project management and doctoral research

- A short course (generic skill)
  - 2 * 3 hours
  - form of a workshop – crash course

- The aim
  - to strengthen the skills of PhD students in the field of PM
  - with a focus on research and scientific projects
  - and linking best PM practices with doctoral research.

Motivation

- Lack of …
  - Well-defined scope of doctoral study
  - Integration of study with research (projects)
  - Clear milestones and deadlines
  - Risk identification and risk mitigation
  - Effective planning – especially of CC/SCI papers
  - Communication with mentor

Vision of a (PhD) research

- Discussion / assignment
  - *When and how a PhD dissertation research field is formally confirmed ?*
  - *Define your research field, research challenges and area of interest !*

What's there, what's „in", how do I fit ? → scientific contribution

PhD as a project

- Project
  - A temporary endeavor to create a unique …
- Progressive Elaboration
  - The iterative process of …
- S.M.A.R.T. goals
  - specific, measurable, attainable, realistic, timely
- Results:
  - artifact, document, potential, …, knowledge

- Discussion / assignment

Describe

- *time constraints,*
- *uniqueness*
- *progressive elaboration*
- *goals*

of your PhD dissertation

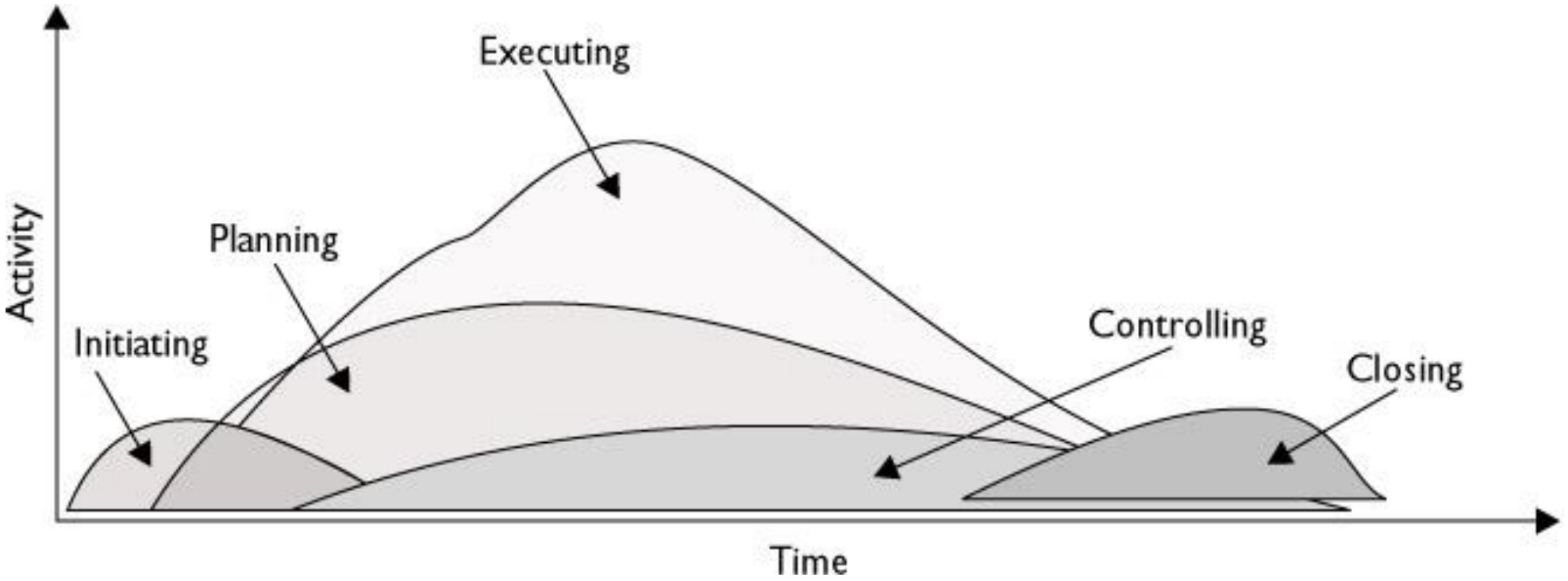
Scope and Creep, Project phases

- **Scope** - project boundaries, work (not) to be done, deliverables
- **Creep** – scope, hope, effort, feature creep
- **Project phases**
  - Defining project phases & deliverables
  - Monitoring project progress through the stages
  - Gates: performance, deliverables, …

- Discussion / assignment
  - *Identify possible creep(s) of your PhD and appropriate mitigation(s)*
  - *Define four main phases of your PhD*
  - *How would phases be verified?*
  - *How would mentor be involved?*

(students fill templates,
an oral analysis follows)

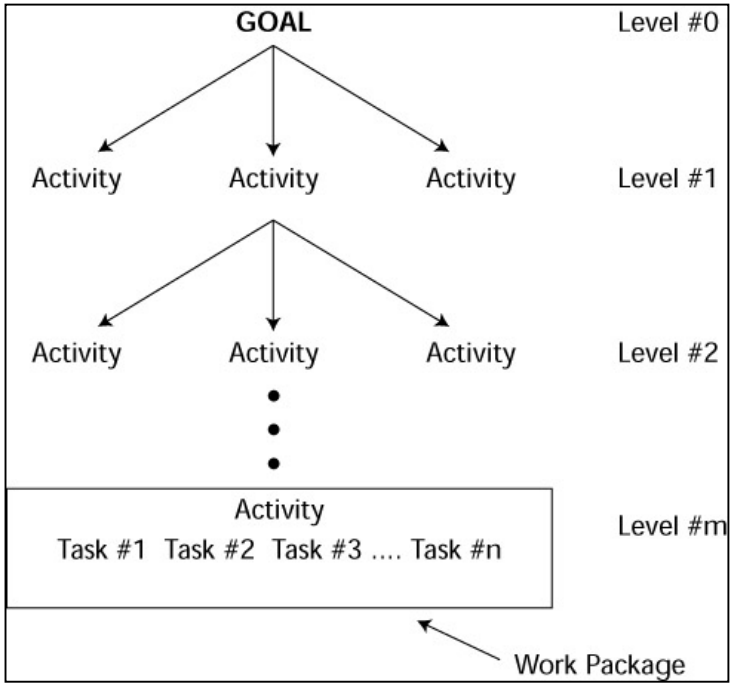
PM process groups



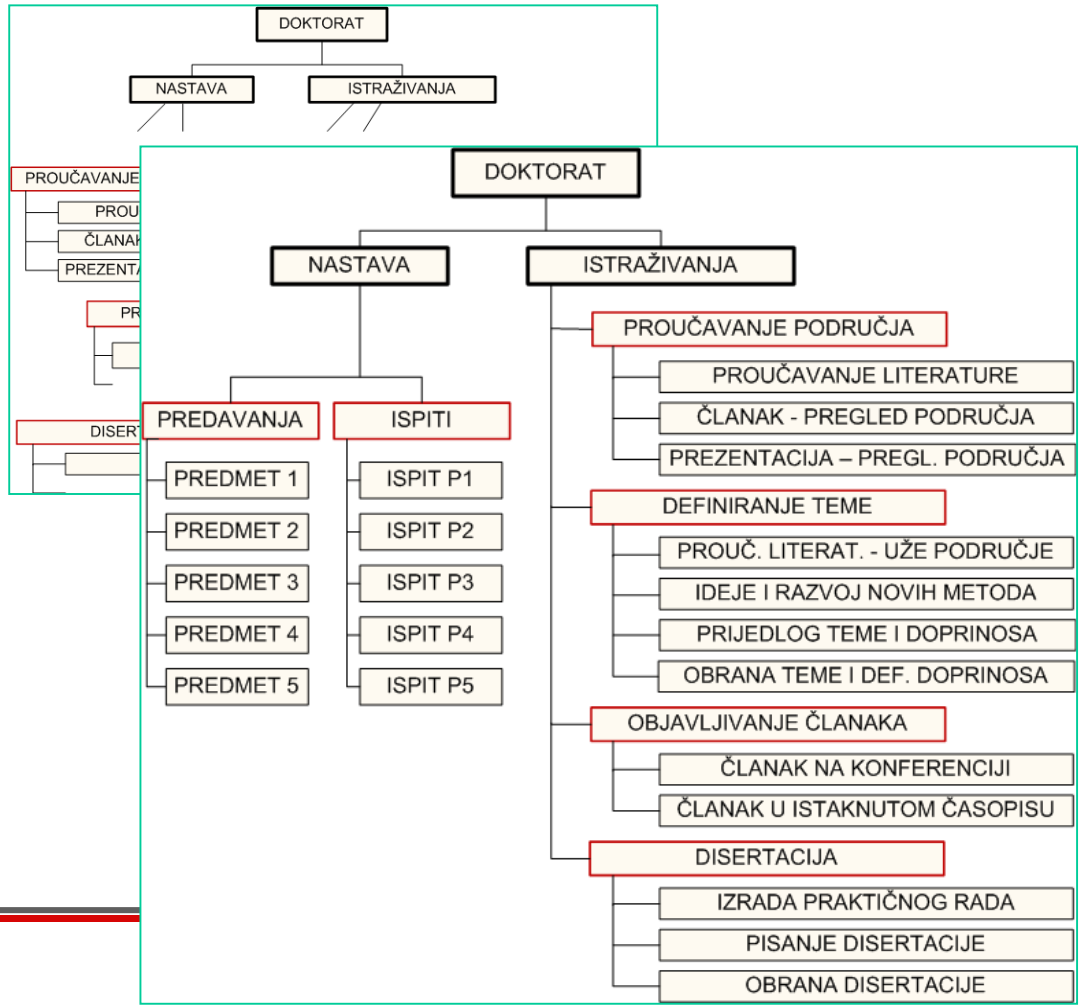
- Discussion
  - PhD work processes?
  - Critical ones?

Project planning

- Rolling wave planning
- Work breakdown structure (WBS)
  - Activity, Work package, Task
- Project milestones

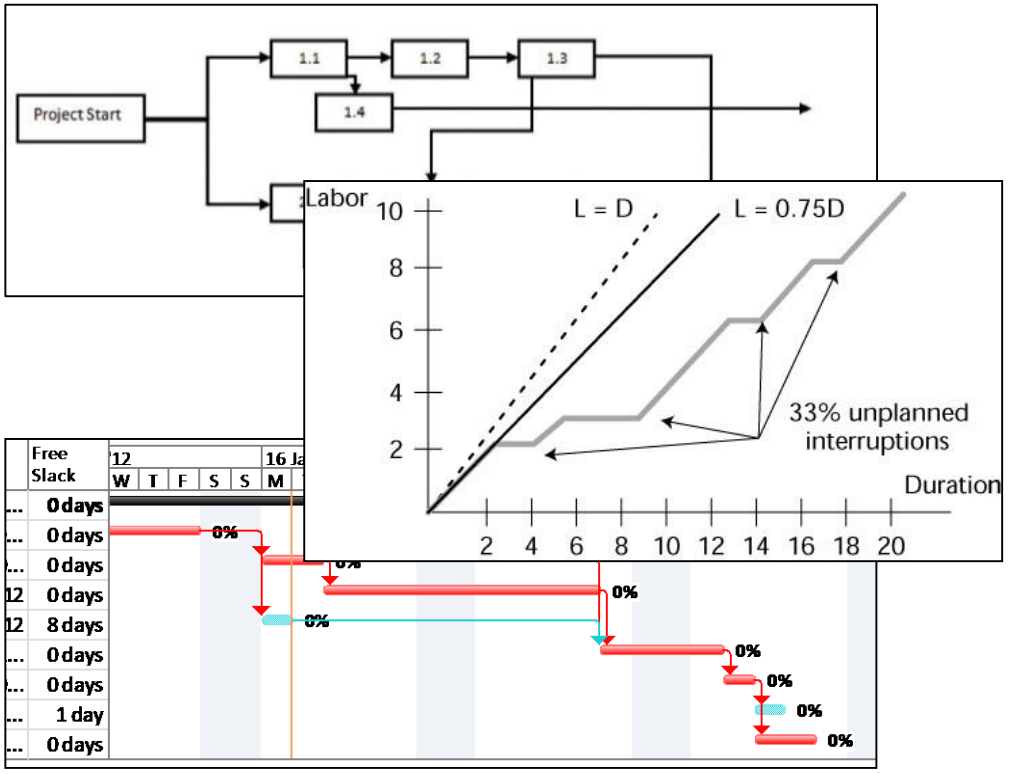


- Brainstorming
  - main PhD WBS activities



Project scheduling

- Project Network Diagram (PND)
- Time, effort, duration estimation
- Gantt chart



- Discussion / assignment
  - *Define milestones for each year of your PhD study !*
  - *Estimate time (deadline) of publication of your CC/SCI indexed paper !*
  - *Draw the network diagram for your PhD WBS!*

(students fill templates,
an oral analysis follows)

Project communications management

- Communications planning
  - within project (team) in general
- Information distribution
  - Communication channels
  - Communication matrix and frequency
- Performance reporting
  - Formats and volume of information
- Meetings and performance reporting
- Manage stakeholders

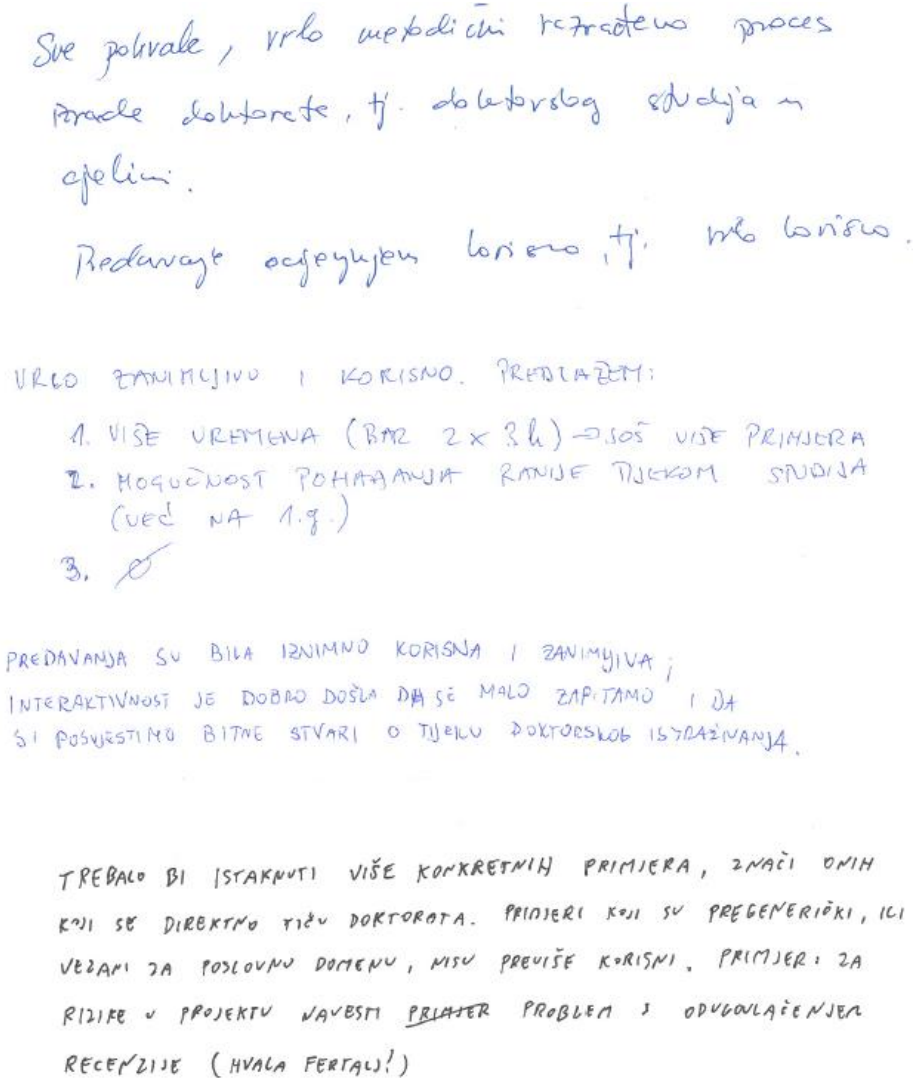
- Discussion
  - *Communication between PhD student and mentor*
    - *Channels*
    - *Format*
    - *Frequency*
    - *Reporting*
    - *Meetings*
  - *Other stakeholders ?*

Risk management

- Risk assessment
  - Risk identification
  - Risk analysis
  - Prioritization
- Risk control
  - Risk management planning
  - Risk resolution
    - Avoidance
    - Sharing
    - Reduction
    - Retention
  - Risk monitoring

- Assignment
  - *Identify risks of PhD as a project!*
  - *Analyse consequences (delays, costs, etc.)*
  - *Define strategy (Plan B) for each risk: trigger, resolution, timeframe*

The outcome



Sve pohvale, vrlo metodički razrađeno proces izrade doktorata, tj. doktorskog studija u cjelini.

Predavanja ocjenjujem korisno, tj. vrlo korisno.

VRLO ZANIMLJIVO I KORISNO. PREDLAŽEM:

1. VIŠE VREMENA (BAR 2 x 3 h) → OŠO VIŠE PRIMJERA
2. MOGUĆNOST POHAĐANJA RANIJE TIJEKOM STUDIJA (VEĆ NA 1. g.)
3. Ø

PREDAVANJA SU BILA IZNIMNO KORISNA I ZANIMLJIVA; INTERAKTIVNOST JE DOBRO DOŠLA DA SE MALO ZAPITAMO I DA SI POSVJESTIMO BITNE STVARI O TIJEKU DOKTORSKOG ISTRAŽIVANJA.

TREBALO BI ISTAKNUTI VIŠE KONKRETNIH PRIMJERA, ZNAČI ONIH KOJI SE DIREKTNO TIČU DOKTORATA. PRIMJERI KOJI SU PREGENERIČKI, ILI VEZANI ZA POSLOVNU DOMENU, NISU PREVIŠE KORISNI. PRIMJER: ZA RIZIKE U PROJEKTU NAVESTI PRIMJER PROBLEM S ODUGOVLAČENJEM RECENZIJE (HVALA FERTALJ!)

- Teachers: 3
- Students: 15

- High student satisfaction
  - *useful,*
  - *interesting,*
  - *motivating*
  - …

Specialist Study

Project Management

Specialist study “Project Management”

- Idea
  - Generic curriculum, applicable in different domains
- Goal
  - to create a complete specialist-specialist in project management
  - as opposed to professional training by certification of partial knowledge
- Motivation
  - knowledge and skills on PM are necessary in both technical and non-technical domains and both civil and public sector
  - academic community more/less lacking knowledge and skills and generally the unique approach to managing scientific projects and research

About the study

- Duration: 1 academic year, i.e. 2 semesters
  - Final specialist work (thesis) can be done and defended in 3rd sem.
- Overall ECTS credits: 60
- Admission conditions:
  - a graduate degree with at least 300 ECTS credits
  - knowledge of English
  - interview with candidate
- The academic title acquired by completing the study
  - sveučilišni specijalist upravljanja projektima (hr)
  - university project management specialist (en)
  - universitatis specialista moderandi inceptorum (lat)
  - univ. spec. mod. incep. (short)

Competences

- Apply methods, techniques and tools for project management,
- Evaluate and apply management and decision-making,
- Adapt project management and control processes to global environments and distributed project teams,
- Apply stakeholder communication with regard to project context and stakeholder role,
- Manage changes to tailor project delivery,
- Analyse and improve the organization's project management practices,
- Evaluate projects, operational and strategic,
- Assess and manage risk in project implementation

The program

Course	Lecturing hrs	ECTS
Obligatory courses		
Foundations of Project Management	30	6
Stakeholder Management and Communications Management	30	6
Project Leadership	30	6
Elective courses (18 ECTS)		
Project Governance	30	6
Organizational Behaviour and Projects	30	6
Portfolio and Program Management	30	6
Project Risk Management	30	6
Project Quality Management	30	6
Project Cost Management	30	6
Project Procurement and Supply Chains	30	6
Project Management Methods and Tools	30	6
Business and Commercial Aspects of Projects	30	6
Specialist thesis		24

Course description template

Course:		
Lecturers:		
Description:		
ECTS:	6	
Study hours:	30	
Competencies:		
Forms of teaching:	Lectures, exercises, and seminars	
Topics:	Title	Hours
		2
		2
		2
Grading:	Seminar, oral exam	
Literature:	1. Author (year). *Title*. Publisher 2.	
Semester:	1	
English:	Yes	
Quality assurance:	Quality monitoring and execution in accordance with the quality management system of the University of Zagreb. Self-evaluation of teaching and interviewing participants.	

Lecturers and Management

- Professional council of study "Project Management„
  - 3 professors : chairman, co-chairman, member
- Committee on lifelong learning
  - Administrative support, supervision, mediation to faculty council
- Teaching staff : 15
  - 8 Faculty of EE and Engineering
  - 5 Faculty of Economics
  - 2 IT company

Workflow of study

- Lectures
  - First 2 semesters – lecturing, obligatory+elective courses (2 *18 ECTS)
  - Student enrols courses with min. 18 ECTS/semester in total
  - Weekly cycles
  - Afternoon sessions

- Thesis (final specialist work)
  - Mentor is assigned on admission to study
  - Theme of work – at the end of 1st semester
  - Work on thesis – 2nd semester, can be continued in 3rd

Miscelaneous

- Students may attend courses from other postgraduate studies
  - If required for specialisation
  - with the consent of the mentor
- Recognition of credits from other courses
  - for attended other postgraduate (specialist and doctoral) studies
  - a credit score based on the documented course contents
- Lecturing in English
  - All courses are offered in English
  - Lectures given by international guests are given in English

Constraints

- Regular deadline to complete the study – 3 years
- Study can be paused and continued – with administrative permission
- Continuation of the study – with approval
  - the teaching obligations and
  - the obligation to pay the study costs
  - are determined in accordance with the current academic year
- Certificate of the completed part of the study
  - for the passed exams

Completing the study

- By earning 60 ECTS credits in total and
- By making and defending the specialist thesis

- Assignment of thesis – after min. 20 ECTS credits earned
- Defence of thesis – after 36 ECTS earned (all courses passed)

- Defence of thesis – once
  - Committee - mentor as president + 2 members,
  - Work evaluation (positive)
  - Oral defence, public
  - Result – defended / not defended

How the study programme was made

- PMI Curriculum Guidelines
- Referent studies
  - Project Management Fast Track – Ryerson University, Toronto
  - Master of Science in Project Management Online - Northwestern University, Evanston (Chicago)
  - MSc in Project Management Module - University of Liverpool,
  - Project Management - UC Berkeley Extension
  - Applied Project Management Certificate Program – University of California Division of Continuing Education
- Resolutions
  - Committee for lifelong learning
  - Faculty council
  - Senate
  - Agency for Science and HE

#	PMI Course	PMI KM ("granules")	PMI	Ryerson etc	NW etc	LP etc
100	Foundations of Project Management	Project Management Principles	T-PM	CKPM 202 Fundamenta	PROJ_MGT 421	Project
110	Foundations of Project Management	Project Phases and Processes	T-PP			
120	Foundations of Project Management	Project Planning and Integration	T-PI	CKPM 203 Planning and Scheduling		
190	Advanced -Sched	Project Scheduling	T-PS	CKPM 203 Planning and	CIV_ENV 336-0	
130	Project Communications	Plan, Distribute, and Manage Project	B-DC	https://nhlearningsolu	http://www.co	http://v
140	Project Communications	Identifying and Engaging Stakeholde	B-SE	http://www.pmcollege.com/courses/detail/st		
150	Project Communications	Project Organization and Context	B-OC			
160	Project Communications	Virtual Project Management	B-VP	https://www.learning	http://cdn.pdtr	https://
380	Project Stakeholder Engagement	Identifying and Engaging Stakeholde	B-SE			
390	Project Stakeholder Engagement	Managing Global Projects	B-GP	http://drum.lib.umd.edu/bitstream/handle/19		
400	Project Stakeholder Engagement	Project Leadership	B-PL			
250	Leadership [in teams]	Project Team Building and Motivatin	B-TB	https://nhlearningsolu	**https://www.k**	Leading
260	Leadership	Project Leadership	B-PL	CKPM 211 Leadership i	http://gradstudies.engi	
180	Advanced	Project Resource Management	T-PR			
280	Organizational Behavior and Projects	Project Organization and Context	B-OC			
290	Organizational Behavior and Projects	Strategic Project Management	S-SM	http://www.informa-r	http://www2.hw.ac.uk/	
300	Organizational Behavior and Projects	Governance in Projects	S-GV			
590		Project Management Office		https://fileman.csuglo	https://secure.	https://
220	Advanced -Cost	Estimating Costs	T-EC			
200	Advanced -EVM	Project Control	T-CP	http://projectlink.co.za/earned-value-		Executi
240	Advanced -pricing, mjesta troška	Finance and Cost Budgeting	T-FC	https://www.hks.harvard.edu/syllabus/2011/9		
480	Special Topics in Project Managemer	Portfolio and Program Management I	S-PP	https://web.stevens.e	PROJ_MGT 429	Sustain
310	Project Governance	Governance in Projects	S-GV	http://www.governan	http://www.m	http://b
320	Project Governance	Project Scope Management	T-SM	http://www.corpedgr	http://www.firebrandt	

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