

LEADING A DEVELOPMENT TEAM PILOT FOR IT PROJECT MANAGEMENT MASTER'S DEGREE STUDENTS



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SEMP: Software Engineering Management Program

Project implemented by:



Funded by:



In partnership with:



American University
in Bulgaria



With the support of:



SEMP

- **Goal:** provide contemporary content and training courses on software engineering and IT services management.
- **Focus:** modern training methods and style.
- **Expected result:** an internationally recognized master degree program in partnership with the Software Engineering Institute of Carnegie Mellon University, and with the support of the Ministry of Education, Youth and Science.
- **Means:** students, professors, future employers, government, users and international clients - speak the same language – the language of quality.



SEMP FOCUS AREAS AND SAMPLE COURSES

Enabling Technology (engineering)	Management (processes)	Business
Design Methods, Deciding What to Design	Organizational (Process) Management, Development, IT Services	Strategy management (BSC) Digitized Ecosystems
Requirements Software/IT Architectures	Team/Personal Process Leading Development Teams	Economic Analysis Financial Accounting Markets & Sales
Advanced Technology: Secure coding Cloud computing, virtualization, etc.	Quantitative Project Management Statistics for IT Managers	Negotiation Communications for IT managers ICT law

THE CURRICULUM AND SEMP

- **Academic courses** transfer (from Carnegie Mellon, ISR – Institute of Software Research): 2-4 (two completed, in pilot phase)
- **Professional courses** (CMU, SEI – Software Engineering Institute): accredited instructors plus additional academic adaptation (five completed, in pilot phase)
- Augmented/improved or newly developed **local courses** (addressing regional specifics, SMEs focus, EU context, etc.): 6-8 (in pilot phase, mentored by ESI, SEI, CMU)



A NEW STYLE OF TEACHING AND COURSE ORGANIZATION

- **Student centric** approach
- **Synchronized** and **cross-linked** content, terminology (based on world standard), with real practical examples and case studies
- Practicum/project work (**studio course**): based on the model used at Carnegie Mellon, during the entire program, projects defined by the industry partners



SEMP IN BRIEF

“The SEMP project is an excellent example of integration and synergy between industrial and academic institutions, supporting organizations and donors in order to implement innovative training and educational method in Bulgarian universities educating IT graduates.”



Dr. George Sharkov, Director,
“European Software Institute Center
Eastern Europe”





BULGARIA

WIKIPEDIA MINUTE

Wikipedia:

- Established in 681
- Capital city: Sofia
- Territory: 111K km² – medium sized European country
- Population: 7.36 million people
 - Predominantly urban
 - Graduates: 19.6%
- ITC sector
 - Strategic sector since mid-1960s
 - 10% of GDP since 2007
 - Annual growth of 15%
- EU & NATO member

Not in Wikipedia:

- Business climate:
 - 10% flat personal income tax
 - 10% flat corporate tax

NBU

Largest private university in Bulgaria

- Established in 1991 in Sofia
- 15 000 students – BSc, MSc & PhD



Campus of the
New Bulgarian University in Sofia,
Bulgaria

Department “Informatics”
(Master Programs) at NBU has

second highest rating

according to Bulgarian University
Ranking System of the Ministry of
Education, Youth and Science of
Republic Bulgaria.

IT PM MASTER'S DEGREE PROGRAM

- **Introduced** in 2009/2010
- **Lecturers**
 - Department Informatics, NBU
 - Faculty of Mathematics and Informatics, Sofia University
 - Institute of Mathematics and Informatics, Bulgarian Academy of Science
 - Boston University (USA, MA)
 - companies
- **Goal:** to prepare IT project managers with a wide range of competences to manage projects successfully in a competitive, dynamic and open environment.



IT PM MASTER'S DEGREE PROGRAM

Knowledge and Skills

- creating, developing and managing IT projects;
- analyzing a project development process and react appropriately;
- problem solving and decision making;
- organization and planning;
- managing risk;
- managing technological recourses, people and finance;
- building and managing an effective team;
- leadership and conflict resolution;
- ability to work in an international context and with an interdisciplinary team;
- design of information systems;
- laws and regulations for the IT sector.



SEI PSP/TSP COURSES

Knowledge and Skills

- **PSP Fundamentals** teaches software engineers the principles, concepts, and benefits of the PSP, a process-based approach for developing software. Students learn how to measure and analyze their personal software process, use process data to improve their personal performance, and apply PSP methods to other structured tasks.
- **PSP Advanced** course teaches software engineers to optimize their process performance.
- **Leading a Development Team** course is designed to teach software managers or team leaders how to manage projects quantitatively in order to complete projects on schedule, within budget, and with all requirements met. The course covers the knowledge and skills leaders need to effectively lead development teams

PSP/TSP EMPOWERS

Knowledge and Skills

- creating, developing and managing IT projects;
- analyzing a project development process and react appropriately;
- problem solving and decision making;
- organization and planning;
- managing risk;
- managing technological recourses, people and finance;
- building and managing an effective team;
- leadership and conflict resolution;
- ability to work in an international context and with an interdisciplinary team;
- design of information systems;
- law regulations for the IT sphere.

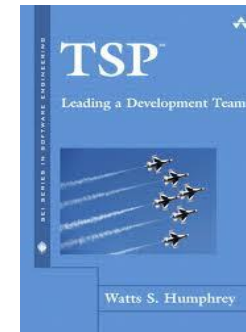


IT PM 2011/2012

SEMESTER 1	SEMESTER 2	SEMESTER 3
IT PM 1	IT PM 3	Modern Technologies for Managing IT Production
IT PM 2	Architectures of Software Systems	Estimating Risk in IT Projects
Workshop on IT PM	Analysis and Design of Information Systems	Statistical Methods
Management of Financial Resources	Management of Human Resources	Marketing Management
Law Regulations of Projects	Software Testing and QA	Data Mining
Information Society Law	Software Estimation	Data Warehouse
Leading a Development Team	Personal Software Process – Fundamentals	Personal Software Process - Advanced




Software Engineering Institute | Carnegie Mellon



Software Engineering Management Program

LEADING A DEVELOPMENT TEAM PILOT

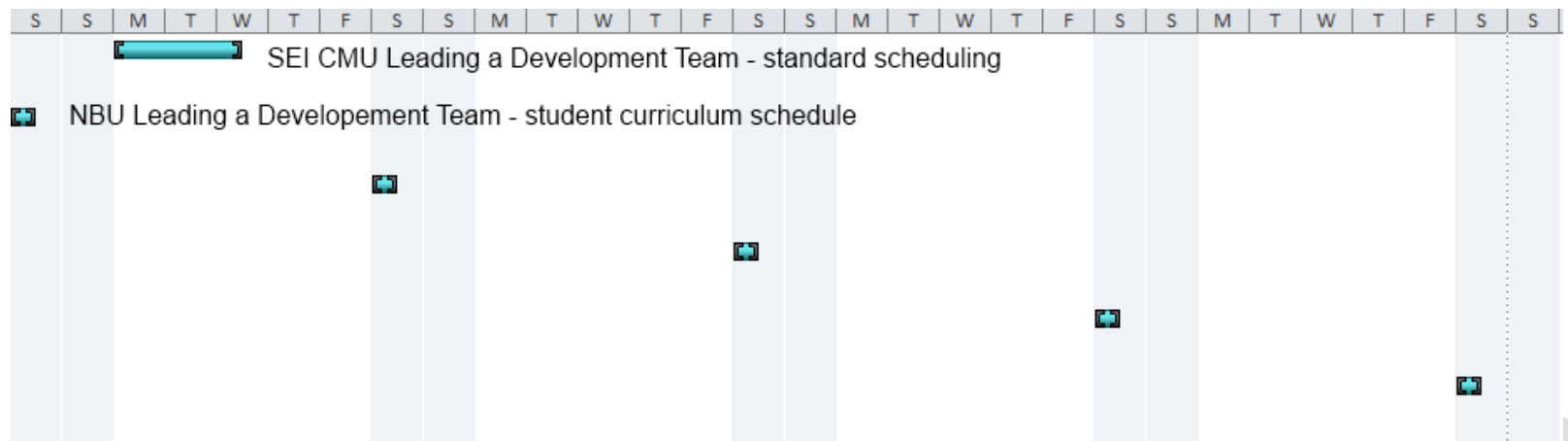
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Bulgarian Higher Education Law
NBU Program Scheme
Academic Mindset

TRAINING SCHEDULE

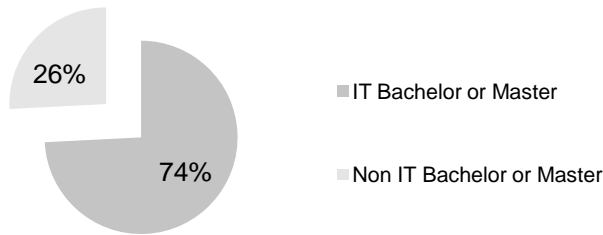
SEI-CMU Leading a Development Team is a professional course planned to be presented in two days and a half. The academic scheme of the Master Degree courses of the New Bulgarian University is 30 academic hours per course of 3 credits.



LDT Curriculum Schedule

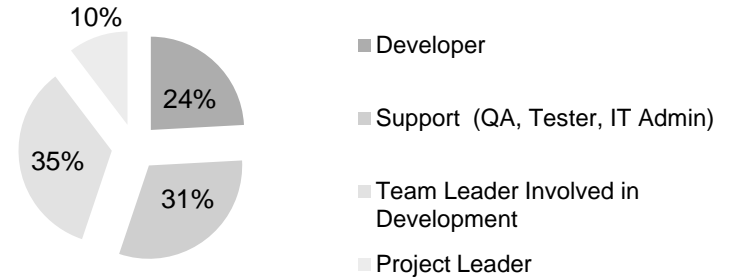
STUDENTS' BACKGROUND

Education



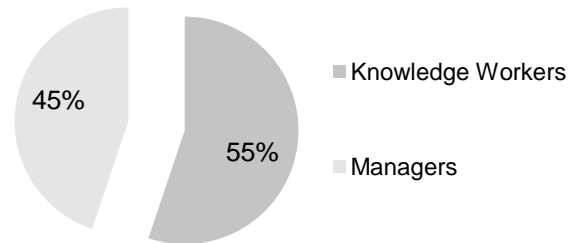
Educational Background of the Students in IT PM Master Degree Program

Current Occupation



Current Occupation of the Students in IT PM Master Degree Program

Organizational Background



Organizational Background of the Students in IT PM Master Degree Program



STUDENTS' UNDERSTANDING OF THE COURSE CONTENT

Leading a Development Team major topics

- TSP Team Leader
- TSP Overview
- Team Launch
- Process Discipline
- Managing the Plan
- Managing Quality
- Reporting to Management
- Leading the Team

Quality management, **earned value** tracking and the basic principles of **reporting** to the management were met with a very high level of understanding.



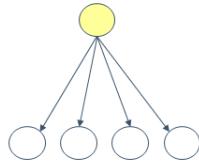
TEAM LEADER CHALLENGE

- The managers:
 - on schedule
 - within budget
 - with all requirements met
- The team members:
 - work on a successful project
 - be part of a “great” team
 - do interesting technical work
 - feel secure in their jobs

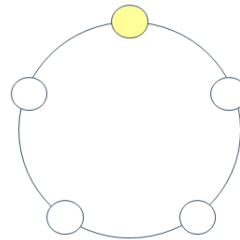
In this **first discussion** students gave evidence that their professional experience, as well as the Project Management I and II part lectures form a solid background for the Leading a Development Team curriculum.



LEADING VS MANAGING



Traditional team



Self-directed team

- Managers - not eager to delegate responsibilities related to project schedule, budget or scope to the developers
- Developers - not eager to take responsibilities for their own work.
- Agile ⇔ TSP

The TSP/PSP do not restrict the software technology and methodology that is used for the development of the software product but add personal and team level measurable processes.



PROJECT ROLES

- Developers
 - apply for more development work if it is challenging or if it is of some kind of professional interest
 - avoid getting involved in any non-technical activities
- Managers
 - are not eager to delegate the entire project planning phase to the developers
 - while declaring willingness to delegate some of the responsibilities to the team, they would prefer to avoid any activities that actually will let the team to manage and organize their work.

Managers ⇔ Developers trust

TSP/PSP data gathering and analysis concept as a rock solid ground for trust.



PROCESS DISCIPLINE

- Students realize the need of some kind of organization that would improve the overall success rate of software projects.
- Developers see discipline as a restriction to the creative process of finding solutions
- Students doubt the concept can be implemented in their work environment.
- Predominant opinion: the ability and capability to follow a disciplined process (or rather, lack thereof) is a national trait.

PSP teaches disciplined process via development. The concept proves itself using the students' own data.



LDT / PSP

PSP details are missing and the students speculate and fill in the gaps with practices from their own professional experience.

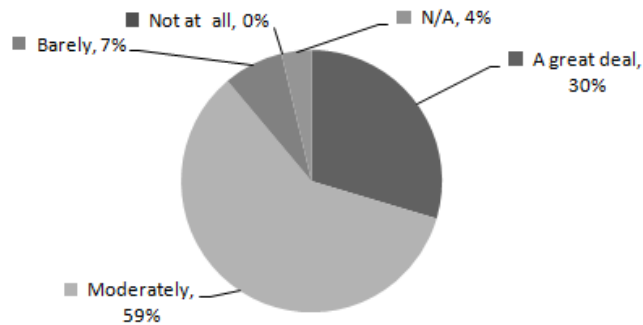
The students are not impressed by the statistical results that show dramatic decrease of schedule deviation and the number of defects/KLOC.

The adoption of the TSP/PSP by the industrial leaders is the measure of the success of the framework.

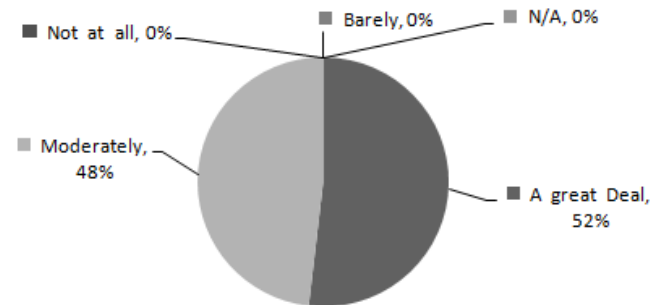


STUDENTS' FEEDBACK

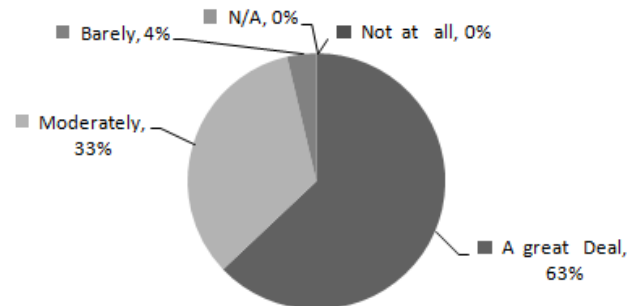
I felt qualified to attend this course



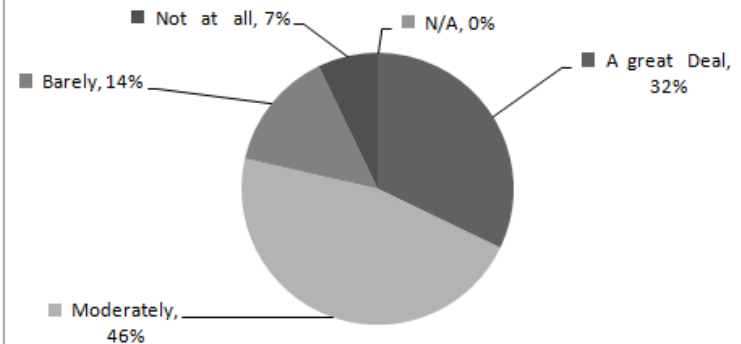
I understand the topics presented in this course



The course content was timely and up-to-date

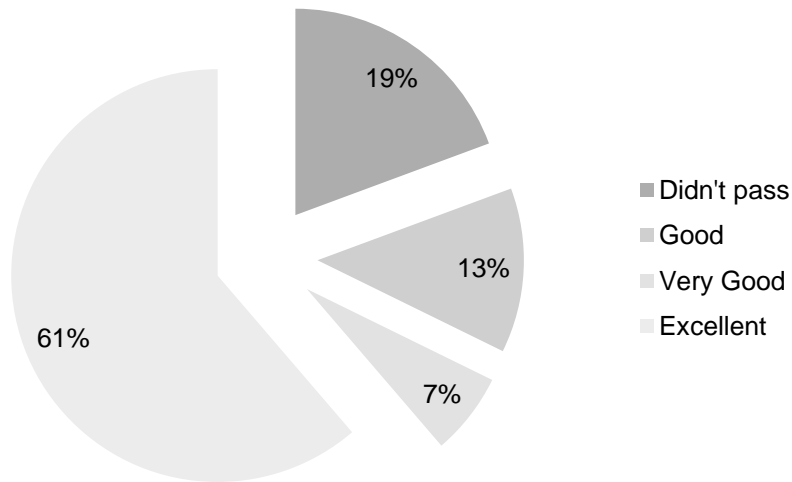


I am satisfied with this course



STUDENTS' RESULTS

Final Results



Final Students Results

The grading system encourages active participation of the students during the lectures and exercises.

The students are graded on their final submissions.



ACADEMIC CHALLENGE - IT PROFESSIONALS

- Teach PSP/TSP in Master's Degree Programs
 - Teach PSP principles, concepts, and benefits, teach how to measure and analyze processes and use data – **PSP Fundamentals**
 - Teach software engineers to optimize their process performance - **PSP Advanced**
 - Teach how to manage projects quantitatively in order to complete projects on schedule, within budget, and with all requirements met. Teach how to lead development teams. – **Leading a Development Team**



ACADEMIC CHALLENGE - IT BEGINNERS

- Teach PSP/TSP in Bachelor's Degree Programs
 - First term in IT BSc programs

Teach PSP along the first programming language (C/C++)

- Insist using PSP in each C/C++ project during BSc.



QUESTIONS?

ANSWERS...

Thank you!

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