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Engineering Educators Pedagogical Training (ENTER)

www.erasmus-enter.org

Syllabuses of iPET-1 courses

November 2019- May 2020

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ABSTRACT

This deliverable is dedicated to the iPET program for engineering educators' pedagogical training, and focuses on courses for iPET-1 module of the program. The paper provides a brief explanation of iPET program structure, as well as the background for the choice of courses and competences to be formed within such program. The deliverable discloses draft versions of syllabuses for iPET-1 courses: 1.1. Innovations in engineering pedagogy, 1.2. Time management and 1.3. Effective communication. Each syllabus provides general information on the course (aim, objectives, content, teaching materials, etc.), structure of the course content and assessment procedures.

INTRODUCTION

This deliverable has been developed within the ENTER project, work package 2 (WP2) – "Development".

The initial task within WP2 was to develop a structure of the iPET program for pedagogical training of engineering educators. This task has been completed by the consortium partners by project meeting in Almaty in October, 2019.

It has been proposed to create 3 iPET modules within the program: iPET-1, iPET-2 and iPET-3. Each of the modules includes a certain set of courses aimed at fostering various competences of engineering educators.

In order to determine the set of courses and competences that should be fostered within the iPET program, the consortium has conducted a massive survey of stakeholders' opinions on this matter. The survey included 5 groups of stakeholders: engineering educators, HEI administration, HEI engineering students, potential employers of HEI engineering graduates and representatives of governmental bodies, involved in education. The number of respondents exceeded 800, representing over 25 regions of Russian Federation and Republic of Kazakhstan. Based on the results of the survey the following structure of iPET modules has been proposed and approved by the consortium:

iPET program	Module		Course	ECTU
iPET-1 (2 ECTU)	**A**	1.1	Innovations in engineering pedagogy	1
		1.2	Time management	0,5
		1.3	Effective interaction	0,5
iPET-2 (8 ECTU)	**A**		1.1, 1.2, 1,3	2
	B	2.1	Enhancement of learning interactivity	2
		2.2	Systems analysis in education	1
		2.3	Pedagogical psychology and communication	1
		2.4	Interaction with stakeholders	1
		2.5	Sustainable development	1
iPET-3	**A**		1.1, 1.2,1,3	2

(20 ECTU)	**B**		2.1, 2.2, 2.3, 2.4, 2.5	6
	C	3.1	Digital education	2
		3.2	Problem-based, Project-based and practice-oriented learning	2
		3.3	Learning outcomes' assessment	2
		3.4	Course design	1
		3.5	Engineering innovation process	2
		3.6	Final project	3

The second task of the WP2 was to develop syllabuses for each of the iPET courses. Each syllabus has been developed by a team of 3 consortium partners, with one leading partner and 2 co-authoring partners. Then, all syllabuses have been reviewed by each partner university of the ENTER project consortium. During an online meeting of ENTER project members in Bratislava, Slovakia, on April 21-23, 2020, all syllabuses and review notes have been presented, discussed and adjusted accordingly, leading to the creation of three deliverables presenting syllabuses (draft v.1) for iPET-1, iPET-2 and iPET-3.

The syllabuses for iPET-1 courses are presented in the following document.

SYLLABUS FOR COURSE 1.1. INNOVATIONS IN ENGINEERING PEDAGOGY

INSTITUTION:	**TO BE FILLED LATER**
PROGRAM:	**iPET 1**
COURSE:	**1.1 INNOVATIONS IN ENGINEERING PEDAGOGY**

	I – IDENTIFICATION					
COMPULSORY Course	**CONTACT TIME - HOURS**				**SELF-STUDY - HOURS**	**CREDITS ECTS**
	LECTURES	**TUTORIALS**	**PRACTICAL /PROJECT**	**TOTAL**		
INNOVATIONS IN ENGINEERING PEDAGOGY	**8**	**2**	**2**	**12**	**13**	**1**

FORMAL PREREQUISITES (IF ANY):
COURSE WEBSITE URL: TO BE FILLED LATER

II – AIMS, SYNOPSIS, CHARACTERIZATION

Background (max. 600 characters)
Provide an overview of the technical, scientific and pedagogical fields that justify this Course

INNOVATIONS IN ENGINEERING PEDAGOGY is a course that combines traditional engineering pedagogy principles together with fundamentals of teaching technology in engineering educators´ pedagogical training.
The key objective is to develop the engineering curriculum in line with the demands of a knowledge-based economy. Paradigmatic changes in society, however, do not only interfere in the field of Information and Communication Technologies (ICT), but there is a rapid development of gamification, Internet of Things (IoT), robotics, augmented reality (AR) and virtual reality (VR). Robotization penetrates all areas of our lives and how efficiently our society will be able to exploit its potential depends on how well each of us understands the principles on which it works. Knowledge-based economy needs qualified teachers who will be able to prepare the young generation for the technological demands of industry 4.0, for the labor market and for further education (Education 4.0).

Aims – overview (max. 750 characters)
Describe pedagogic aims and say how this Course contributes to the Program

1. To explain need for engineering pedagogy as a discipline.
2. To acknowledge a role of engineers in contemporary world.
3. To describe the traditional instruction and main features of the modernisation in university education.
4. To recognise the importance of goals in educational process and describe various taxonomies of learning objectives.
5. To analyse concepts of ´pedagogical documentation´ and ´curriculum´.
6. To compare organisational forms of university education, to describe its strengths and weaknesses.
7. To describe how students´ learning achievements are controlled and evaluated.

8. To recognize and understand modern conceptions of education and be ready to apply them in instruction.
9. To understand main principles of pedagogical research and describe phases of research work.

Specific Aims (max. 1000 characters)
Provide description of specific pedagogic objectives

O1. To select content, methods and media corresponding to the discipline, subject matter, organisational form and students.
O2. To perform a didactic analysis of selected subject matter.
O3. To formulate particular, clear, specific learning objectives of selected topic in technical subject.
O4. To prepare conception of the learning program (curriculum draft).
O5. To elaborate a written plan of the lesson, to design and execute a lesson in technical subject and to reflect on one's own teaching.
O6. To prepare a didactic test from a selected subject matter.
O7. To give examples of educational media in technical teacher education (esp. IoT, gamification, VR, AR).
O8. To choose and apply didactic resources in accordance with learning outcomes to be accomplished.
O9. To defend and evaluate value and functions of didactic resources and new media (HIT) according to specific objectives.
O10. To design and develop a scenario or structure of on-line course.

Contents (max. 1000 characters)
Describe theoretical and practical nature of the course content

The subject provides a theoretical basis for pedagogical competencies and is in close relation with the pedagogical practice.

- Engineering Pedagogy/Teaching Methodology as a scientific and academic discipline in Technical Teacher Education; Relationship Engineering Pedagogy to other social sciences, Education 4.0 (1 hr, cca. 8,5 %)
- Educational programs and curricula (1 hr, cca. 8,5 %)
- Educational goals of technical education; key and professional competencies (1 hr, cca. 8,5 %)
- Didactic analysis and specification of the objectives in technical education (2 hrs, cca. 16 %)
- Didactic principles, application in technical education (1 hr, cca. 8,5 %)
- Teaching diagnosis and evaluation of students (1 hr, cca. 8,5 %)
- Overview of (active) teaching methods (2 hrs, cca. 16 %)
- Organizational forms of teaching (1 hr, cca. 8,5 %)
- Educational means and didactic resources, electronic digital resources (1 hrs, cca. 8,5 %)
- Agile methodologies in Education, eLearning (1 hrs, 8,5 %)

Main Teaching Material

1. Melezinek, A. 1994. Inženýrská pedagogika. Praha : Masarykův ústav vyšších studií ČVUT, 1994.
2. Driensky, D. 2007. Inžinierska pedagogika. Bratislava : Slovenská technická univerzita v Bratislave, 2007, 185 p., ISBN 978-80-8096-040-7.
3. Turek, I. 2010. Didaktika. Bratislava : Wolters Kluwer, 2010, 598 s., ISBN 978-80-8078-322-8.

4. Auer M.E. The International Society for Engineering Pedagogy (IGIP) and the New Pedagogic Challenges in Engineering Education //*Vysshee obrazovanie v Rossii* [Higher Education in Russia]. 2014. №6, pp. 28-33.
5. Barbera, E., Garcia, I., & Fuertes-Alpiste, M. (2017). A Co-Design Process Microanalysis: Stages and Facilitators of an Inquiry-Based and Technology-Enhanced Learning Scenario. The International Review of Research in Open and Distributed Learning, 18(6). https://doi.org/10.19173/irrodl.v18i6.2805
6. Kersten S. (2018) Approaches of Engineering Pedagogy to Improve the Quality of Teaching in Engineering Education. In: Drummer J., Hakimov G., Joldoshov M., Köhler T., Udartseva S. (eds) Vocational Teacher Education in Central Asia. Technical and Vocational Education and Training: Issues, Concerns and Prospects, vol 28. Springer, Cham, pp. 129-139.

Complementary Teaching Material

Provide complementary references of books, papers and technical information, as appropriate

1. Turek, I. 2005. Úvod do didaktiky vysokej školy. Košice : Technická univerzita v Košiciach, 2005, 318 s., ISBN 80-7099-882-2.
2. Hrmo, R. a kol. Didaktika technických predmetov. Bratislava : Slovenská technická univerzita, 2005, 137 s., ISBN 80-227-2191-3.

Teaching/Learning Tools

List software, e-learning tools, etc.

MS Office, Mentimeter.com, Kahoot

Previous knowledge assumed as acquired

Material Describe expected knowledge	**Source** Identify courses where this knowledge should have been acquired
basic knowledge of didactics	previous study (secondary school, university, courses)

Teaching/Learning methodology

Describe innovative teaching and learning methods

Teaching in the course is based primarily on the method of interpretation, the method of interview, cooperative teaching, problem teaching, independent work, analysed teaching presentation and discussion, tutorials with practical teaching presentation. The course is realized so that after end of the course, participants will be able to creatively use the acquired knowledge in teaching practice. Within the framework of cooperative teaching, the course participants work in small groups – they solve tasks, acquire knowledge, perform various practical activities in an atmosphere of equality and cooperation. In problem-based teaching, different teaching methods and strategies are used, such as heuristic teaching, creative teaching, discovery learning, guided discovery, inquiry teaching etc. The common feature is the effort to develop creative thinking, creative abilities, cognitive motivation and independence, creative acquisition of knowledge and ways of action.
The teacher applies TQM (Total Quality Management) elements important for the quality of the teaching process:
- focus on the satisfaction of the partners - participants of the course (finding out students' preferences, evaluating the quality of the teaching unit),

- focus on the learning process (focus on the quality of the learning process - applying the latest information, trends, innovation; providing feedback),
- continuous improvement - improvement of the teaching process, application of a systematic approach of the PDCA cycle (P – Plan, D- Do, C – Check, A - Act),
- creating a favourable climate (culture) in the teaching process of the course.

Characterization of objectives and course program
A – Estimated percentage distribution of pedagogical and technological content

- Pedagogical component (establishes and develops pedagogical basis) – 80 %
- Technological component (applies to design and process operation) – 20 %

Characterization of objectives and course program
B – Outcomes – in conformity with EUR-ACE criteria (later on we will adjust this to the ENTER Standards)

Describe what students are expected to 'understand' or 'know' or 'be able to do' after this course with relation to the six outcomes of the EUR-ACE framework standards:

Group of outcomes	**Outcome** (number & name)
Knowledge and Understanding	O1, O2, O3, O4, O5, O7
Organization of students' Engineering Analysis	O2, O3, O4, O5, O6, O7, O8
Organization of students' Engineering Design	O2, O3, O4, O5, O6, O7, O8
Organization of students' Investigations	O4, O6
Organization of students' Engineering Practice	O4, O5
Transferable Skills	O1, O2, O3, O4, O5, O6, O7, O8, O9, O10

III – PLANNING

COMPULSORY UNITS of the Course (including self-guided learning)	**SUMMARY**	**OBSERVATIONS**
Engineering Pedagogy/Teaching Methodology as a scientific and academic discipline in Technical Teacher Education, Relationship Engineering Pedagogy to other social sciences, Education 4.0	The importance and the basis of Engineering Pedagogy. Teaching Methodology as a scientific and academic discipline in Technical Teacher Education and use in pedagogical practice. Relationship Engineering Pedagogy to other social sciences, especially educational, psychological and social. Education 4.0 – the basis and the application in practice.	Interaction of teacher and course participants within the course. Contact hours: 1 Self-study/autonomous work hours: 1 Outcomes: 1
Educational programs and curricula	Creation of Educational programs and curricula.	Interaction of teacher and course participants within the course. Contact hours: 1

		Self-study/autonomous work hours: 2 Outcomes: 1
Educational goals of technical education; key and professional competencies	Educational goals of technical education – classification, formulation and implementation in pedagogical practice. Key and professional competencies of the teacher.	Interaction of teacher and course participants within the course. Contact hours: 1 Self-study/autonomous work hours: 1 Outcomes: 1
Didactic analysis and specification of the objectives in technical education	Didactic analysis and specification of the objectives in technical education – the basis, principles, application in pedagogical practice.	Interaction of teacher and course participants within the course. Contact hours: 2 Self-study/autonomous work hours: 2 Outcomes: 1
Didactic principles, application in technical education	Didactic principles, application in technical education and the role of the teacher.	Interaction of teacher and course participants within the course. Contact hours: 1 Self-study/autonomous work hours: 1 Outcomes: 1
Teaching diagnosis and evaluation of students	Teaching diagnosis and evaluation of students – the methods, principles and implementation in pedagogical practice.	Interaction of teacher and course participants within the course. Contact hours: 1 Self-study/autonomous work hours: 1 Outcomes: 1
Overview of (active) teaching methods	Overview of (active) teaching methods and use in the teaching process.	Interaction of teacher and course participants within the course. Contact hours: 2 Self-study/autonomous work hours: 2 Outcomes: 1
Organizational forms of teaching	Organizational forms of teaching – classification, teacher and students activity.	Interaction of teacher and course participants within the course. Contact hours: 1 Self-study/autonomous work hours: 1 Outcomes: 1

Educational means and didactic resources, electronic digital resources	Educational means and didactic resources, electronic digital resources – the importance, classification, functions and principles by using.	Interaction of teacher and course participants within the course. Contact hours: 1 Self-study/autonomous work hours: 1 Outcomes: 1
Agile methodologies in Education, eLearning	Agile methodologies in Education, eLearning – the basis and use in pedagogical practice.	Interaction of teacher and course participants within the course. Contact hours: 1 Self-study/autonomous work hours: 1 Outcomes: 1

IV – ASSESSMENT PROCEDURE

Self-Assessment

Provide example sheets, paper & pencil versus computer-aided worked examples

Self-assessment form

Teacher´s Assessment

1. Written work – Preparation for the teaching process 30 %
2. Portfolio 70 %

ASSESSMENT TOOLS (ONE TABLE FOR EACH TOOL)

ASSESSMENT TOOL 1

NAME	Written work – Preparation for the teaching process
TOOL TYPE	Written work
ASSESSMENT TYPE	Summative
IMPLEMENTATION	The course participant will create a written work – preparation for the teaching process
DESCRIPTION	The course participant will create a written work – preparation for the teaching process in the selected subject
CRITERIA, RUBRICS, RATING SCALES	Preparation for the teaching process focuses on the elements of the didactic system

ASSESSMENT TOOL 2

NAME	Portfolio
TOOL TYPE	Presentations
ASSESSMENT TYPE	Formative
IMPLEMENTATION	During the course
DESCRIPTION	Presentations of the work, presentations of the group work

CRITERIA, RUBRICS, RATING SCALES	Presentation of the work.

ASSESSMENT TOOLS VERSUS OUTCOMES

TOOLS / OUTCOMES	WRITTEN WORK – PREPARATION FOR THE TEACHING PROCESS	PORTFOLIO
OUTCOME 1 TO SELECT CONTENT, METHODS AND MEDIA CORRESPONDING TO THE DISCIPLINE, SUBJECT MATTER, ORGANISATIONAL FORM AND STUDENTS	x	x
OUTCOME 2 TO PERFORM A DIDACTIC ANALYSIS OF SELECTED SUBJECT MATTER	x	
OUTCOME 3 TO FORMULATE PARTICULAR, CLEAR, SPECIFIC LEARNING OBJECTIVES OF SELECTED TOPIC IN TECHNICAL SUBJECT	x	x
OUTCOME 4 TO PREPARE CONCEPTION OF THE LEARNING PROGRAM (CURRICULUM DRAFT)	x	x
OUTCOME 5 TO ELABORATE A WRITTEN PLAN OF THE LESSON, TO DESIGN AND EXECUTE A LESSON IN TECHNICAL SUBJECT AND TO REFLECT ON ONE'S OWN TEACHING	x	
OUTCOME 6 TO PREPARE A DIDACTIC TEST FROM A SELECTED SUBJECT MATTER		x
OUTCOME 7 TO GIVE EXAMPLES OF EDUCATIONAL MEDIA IN TECHNICAL TEACHER EDUCATION (ESP. IOT, GAMIFICATION, VR, AR)	x	
OUTCOME 8 TO CHOOSE AND APPLY DIDACTIC RESOURCES IN ACCORDANCE WITH LEARNING OUTCOMES TO BE ACCOMPLISHED	x	
OUTCOME 9 TO DEFEND AND EVALUATE VALUE AND FUNCTIONS OF DIDACTIC RESOURCES AND NEW MEDIA (HIT) ACCORDING TO SPECIFIC OBJECTIVES	x	
OUTCOME 10 TO DESIGN AND DEVELOP A SCENARIO OR STRUCTURE OF ON-LINE COURSE		x

ASSESSMENT: ACHIEVED LEVEL OF LEARNING OUTCOMES (TO BE FILLED DURING OR AT THE END OF THE COURSE)

OUTCOME	NOT IMPLEMENTED	ATTEMPTED IMPLEMENTATION	MANY DEFECTS	SOME DEFECTS	MINOR DEFECTS	CORRECT	EXCEPTIONAL
OUTCOME 1							
OUTCOME 2							
…							
OUTCOME N							

Levels of outcomes' achievement correspond to:

- **Exceptional** - exceeded all goals; applied knowledge to new situations and / or solved standard problems competently
- **Correct** - achieved all objectives in a minimally competent manner; applied the knowledge and skills to known standard cases
- **Minor defects** - achieved the most important goals competently; denoted some shortcomings
- **Some defects** - reached the objectives in general computation; demonstrated some weaknesses/defects
- **Many defects** - achieved only minimum goals; demonstrated many weaknesses/defects
- **Attempted Implementation** - failed to meet minimum objectives; demonstrated some skills
- **Not Implemented** - have not demonstrated a minimally significant set of skills; violated fundamental principles of engineering science / pedagogy and / or nothing minimally acceptable was produced

NOTES (PRIVATE/RESTRICTED TO THIS FORM)

NOTES (PUBLIC/TO BE AVAILABLE ONLINE)

SYLLABUS FOR COURSE 1.2. TIME MANAGEMENT

INSTITUTION:	**TO BE FILLED LATER**
PROGRAM:	**iPET-1**
COURSE:	**1.2. TIME MANAGEMENT**

I – IDENTIFICATION						
COMPULSORY COURSE	**CONTACT TIME - HOURS**				**SELF-STUDY HOURS**	**CREDITS ECTS**
	LECTURES	**TUTORIALS**	**PRACTICAL /PROJECT**	**TOTAL**		
TIME MANAGEMENT	**3**	**1**	**3**	**7**	**5,5**	**0,5**
FORMAL PREREQUISITES (IF ANY):						
COURSE WEBSITE URL: TO BE FILLED LATER						

II – AIMS, SYNOPSIS, CHARACTERIZATION

Background (max. 600 characters)

Excellent time management allows engineering educators to create a healthy balance in their workflow and home life. Knowing how to manage time means that engineering educators will be able to accomplish more in shorter periods of time with less effort.

Engineering educators, in order to deal effectively with deadlines, last minute changes, different schedules, leadership issues, the last technology, modern communications, more than ever, educators need to be effective in planning and managing their time.

Effective time management can help increase productivity and reduce stress. This requires knowledge of the basic principles and methods of time management including organization of time at any level - personal, team, collaborative work. Nowadays time management system covers four structural elements (efficiency, technology, strategy and reflection).

Presently, increase your time management skills to stay organized, keep a clear mind, and be more productive either in work or life is a relevant skill that is valued by the working market.

Aims – overview (max. 750 characters)

"Time Management" course unit will enable educators with strategies and techniques they need to make the most of their precious time. This course will help educators set deadlines, get organized, delegate tasks, and prioritize their to-do list. Therefore, becoming more effective in the workplace, have more energy to achieve more as well as make more time to do things they love.

Classes are oriented to contribute to the development of educators' awareness of time wasters and, to provide them with the basic concepts and methods of Time Management allowing educators to develop technics of controlling their time, agendas and be productive and efficient in their activities.

The success of Time Managing depends of the way we perceive time; How we decide tasks' priority through "Prioritization Matrix"; Plan our activities; Being aware of "Time Wasters".

All these leads to a more Work Fulfilling and Life Meaningful and Reduce Stress and Avoid Feeling Overwhelmed.

Specific Aims (max. 1000 characters)

At the end of the course, it is expected the educators are able to:

O1. To plan and prioritise their work more efficiently;
O2. To manage interruptions more effectively;
O3. Develop practical techniques and strategies for more effective time management;
O4. Manage their activities more effectively being aware of the "Time-Wasters";
O5. Be able to delegate tasks less important, to others in the team, in other to save time to accomplish the most important tasks using "Prioritization Matrix" methodology;
O6. Adopt appropriate strategies for dealing with interruptions and anything else which "steals" time.

Contents (max. 1000 characters)

1. Managing yourself (1,5 h – 15%)
   1.1. What is time
   1.2. The benefits of planning: identifying your priorities
   1.3. Linking time to your objectives: short and long term
   1.4. Setting SMART (Specific, Measurable, Achievable, Realistic, Timed) goals
2. Guidelines and Tools for Efficient Planning (1,5h – 15%)
   2.1. Using planning and scheduling techniques
   2.2. Determination of the importance of defining priorities, using the "Prioritization Matrix" that make time much more productive
   2.3. Advantages of being aware of the "Time Wasters" and its impact on self-motivation and daily performance
3. Managing the information flow – emails, phone and messaging (1h – 10%)
   3.1. Relevance of effective delegation: the five steps to effective delegation
   3.2. Managing Meetings and Time in an efficient way lead to Work Fulfilling and Life Meaningful

Main Teaching Material

1. Adams, R. V., & Blair, E. (2019). Impact of Time Management Behaviors on Undergraduate Engineering Students' Performance. SAGE Open. https://doi.org/10.1177/2158244018824506
2. Ashton, R. (2012). Successful Time Management in a week. Social Entrepreneur
3. McKay Brett, Kate (2013). "The Eisenhower Decision Matrix: How to Distinguish Between Urgent and Important Tasks and Make Real Progress in Your Life".
4. Patrick Forsyth (2013). Successful Time Management. Kogan Page Publishers. pp. 90–93. ISBN 978-0-7494-6723-4.

Complementary Teaching Material

5. Aeon, B., Aguinis, H. (2017). It's about time: New perspectives and insights on time management. Academy of Management Perspectives, 31(4), 309–330.doi:10.5465/amp.2016.0166
6. Morgenstern, J. (2004). Time management from the inside out: the foolproof system for taking control of your schedule and your life. Holt Paperbacks

Teaching/Learning Tools
Software, preferably open source or widely available (e.g. MS Office);
Teams, Zoom;
White blackboard,
Kahoot; Quizzes, Handouts

Previous knowledge assumed as acquired

Material	**Source**
-	-

Teaching/Learning methodology
The teaching method presumes an interaction between educators and teachers. Therefore, the course is based on active participation of educators in working either in group or individually on the topic of planning their activities in short and long term. These classes are based on analysing case studies; tutorials and teamwork.

Characterization of objectives and course program
A – Estimated percentage distribution of pedagogical and technological content

- Pedagogical component (establishes and develops pedagogical basis) Teamwork + Peer evaluation – 40 %
- Oral Presentation of the project developed on classes (PowerPoint, Prezi …);
- Duration of presentation – 15'– 60%

Characterization of objectives and course program
B – Outcomes – in conformity with EUR-ACE criteria (later on we will adjust this to the ENTER Standards)

Group of outcomes	**Outcome** (number & name)
Knowledge and Understanding	O1; O4
Organization of students' Engineering Analysis	
Organization of students' Engineering Design	O2; O3; O4
Organization of students' Investigations	O3; O4; O5
Organization of students' Engineering Practice	O5; O6
Transferable Skills	O1; O2; O3; O4; O5; O6

III – PLANNING		
COMPULSORY UNITS of the Course (including self-guided learning)	**SUMMARY**	**OBSERVATIONS**
Self-guided learning	Educators should study and look for information on their own.	5,5h
1. Managing Yourself 2. Guidelines and Tools for Efficient Planning 3. 3. Managing the information flow – emails, phone and messaging	The importance and basic concepts of Time Management techniques and strategies for being successful in their professions.	3h – O1; O2; O3; O4; O5
Tutorials/ Interactive lectures	Search pedagogical material related to the course.	1h – O1; O2; O3;
Practical / Project	Prepare and present the project.	3h – O1; O2; O3; O4; O5; O6

IV – ASSESSMENT PROCEDURE
Self-Assessment: Self-analyses of the learning outcomes of time management course and Peer evaluation. Material used in classes: Pencil, paper, research of articles, internet, etc.
Teacher´s Assessment: Teamwork Project 40%; Oral presentation (**PowerPoint or Prezi**) and report 60%

ASSESSMENT TOOLS (ONE TABLE FOR EACH TOOL)

ASSESSMENT TOOL 1

NAME	Teamwork Project
TOOL TYPE	Students' Idea development (3-5 students)
ASSESSMENT TYPE	Summative
IMPLEMENTATION	Practical classes
DESCRIPTION	Idea development in group
CRITERIA, RUBRICS, RATING SCALES	Pedagogical component: Teamwork (30%) Peer evaluation (10%) – Total 40 %

ASSESSMENT TOOL 2

NAME	Presentation and Report
TOOL TYPE	Students' Idea development (3-5 students)
ASSESSMENT TYPE	Summative
IMPLEMENTATION	Practical classes
DESCRIPTION	Idea development in group

CRITERIA, RUBRICS, RATING SCALES	Project Oral Presentation (40%) + Report (20%) = 60 %

ASSESSMENT TOOLS VERSUS OUTCOMES

TOOLS / OUTCOMES	TOOL 1 TEAMWORK PROJECT	TOOL 2 PRESENTATION REPORT
OUTCOME 1	X	X
OUTCOME 2	X	X
OUTCOME 3	X	X
OUTCOME 4	X	X
OUTCOME 5	X	X
OUTCOME 6	X	X

ASSESSMENT: ACHIEVED LEVEL OF LEARNING OUTCOMES (TO BE FILLED DURING OR AT THE END OF THE COURSE)

OUTCOME	NOT IMPLEMENTED	ATTEMPTED IMPLEMENTATION	MANY DEFECTS	SOME DEFECTS	MINOR DEFECTS	CORRECT	EXCEPTIONAL
OUTCOME 1							
OUTCOME 2							
…							
OUTCOME N							

Levels of outcomes' achievement correspond to:

- **Exceptional** - exceeded all goals; applied knowledge to new situations and / or solved standard problems competently
- **Correct** - achieved all objectives in a minimally competent manner; applied the knowledge and skills to known standard cases
- **Minor defects** - achieved the most important goals competently; denoted some shortcomings
- **Some defects** - reached the objectives in general computation; demonstrated some weaknesses/defects
- **Many defects** - achieved only minimum goals; demonstrated many weaknesses/defects
- **Attempted Implementation** - failed to meet minimum objectives; demonstrated some skills
- **Not Implemented** - have not demonstrated a minimally significant set of skills; violated fundamental principles of engineering science / pedagogy and / or nothing minimally acceptable was produced

NOTES (PRIVATE/RESTRICTED TO THIS FORM)

None

NOTES (PUBLIC/TO BE AVAILABLE ONLINE)

None

SYLLABUS FOR COURSE 1.3. EFFECTIVE COMMUNICATION

INSTITUTION:	**TO BE FILLED LATER**
PROGRAM:	**iPET 1**
COURSE:	**1.3. EFFECTIVE COMMUNICATION**

I – IDENTIFICATION						
COMPULSORY COURSE	**CONTACT TIME - HOURS**				**SELF-STUDY - HOURS**	**CREDITS ECTS**
	LECTURES AND SEMINARS	**TUTORIALS**	**PRACTICAL /PROJECT**	**TOTAL**		
EFFECTIVE COMMUNICATION	**4**	**3**	**3**	**10**	**2,5**	**0,5**

FORMAL PREREQUISITES (IF ANY):

COURSE WEBSITE URL: TO BE FILLED LATER

II – AIMS, SYNOPSIS, CHARACTERIZATION

Background

Skills in effective communication, analysis and presentation of the ideas and the results of research/scientific and academic activities are extremely essential in order to be successful in research, engineering and teaching of the technical subjects

Aims – overview

The training process is aimed at improving the complex of professional and general cultural communicative competencies to improve communication skills that contribute to enhance the effectiveness of teaching, scientific and engineering activities through lectures, seminars, teamwork, self-study and practical exercises.

Specific Aims:

- O1 - To be able to use their skills in everyday communication at work and in the teaching and learning process;
- O2 - To be able to critically analyse presentations and texts, present arguments and objections, and proofs to them;
- O3 - To be able to effectively communicate, give a talk, argue and defend their points of view and catching slides for public presentations using modern tools (Prezi, PowerPoint, GoogleSlides, etc.

Contents

What is human communication? What is effective human communication? Verbal and nonverbal messages. Coding and decoding of the messages. Words, their meaning and ambiguity. Visual, vocal and metacommunication. Listening and pseudo listening. How to listen effectively? The role of communication in the learning process; effective communication strategies; cooperation strategy.

Debating - arguments, objections and proofs for them

How to prepare for a presentation and making a speech? How to be persuasive, analytical and critical? Know and understand your audience. Structure of a speech. How to present scientific and academic data? Training for a speech

Writing analytical and critical reviews. How to organize discussions and debates, presenting arguments, objections and proofs for them?

How to write and defend projects and theses? Questions and answers. Roles of a supervisor and the learner. Assessment of the projects and theses. Slides, video and audio. Review of popular presentation resources and tools (Prezi, PowerPoint, GoogleSlides, etc.). Correct and readable presentation of information. Trends in presentation design. Visualization of data.

Main Teaching Material

1. Human Communication: Principles and Contexts - by Stewart Tubbs, Sylvia Moss
2. Public Speaking and Presentations for Dummies - by Malcolm Kushner

Complementary Teaching Material

1. Art of presentation by Alexey Kapterev (in Russian)
2. Writing Research Papers: A Complete Guide - by James D. Lester

Teaching/Learning Tools

MS Office, MS Teams, Google Docs

Previous knowledge assumed as acquired

Material	**Source**
-	-

Teaching/Learning methodology

Lectures, seminars, debates, active learning methods, teamworks, homeworks, self-study and consulting

Characterization of objectives and course program

A – Estimated percentage distribution of pedagogical and technological content

- Pedagogical component (establishes and develops pedagogical basis) – 60 %
- Technological component (applies to design and process operation) – 40 %

Characterization of objectives and course program

B – Outcomes – in conformity with EUR-ACE criteria (later on we will adjust this to the ENTER Standards)

Group of outcomes	**Outcome**
Knowledge and Understanding	O1,O2 and O3

Organization of students' Engineering Analysis	O2 and O3
Organization of students' Engineering Design	O2 and O3
Organization of students' Investigations	O1,O2 and O3
Organization of students' Engineering Practice	O2 and O3
Transferable Skills	O1, O2 and O3

III – PLANNING

COMPULSORY UNITS of the Course (including self-guided learning)	**SUMMARY**	**OBSERVATIONS**
Human communication (16%)	The main principles and role of the communication in the teaching process	Lecture (1 hr), seminar (1 hr), active learning O1, O3 *Estimated time presented, as active learning is used, the time may be changed in all units*
Text Analysis (8%)	Different scientific texts and analysis of the texts	Self-study (1 h) O1, O2, O3
Debating (12%)	Debating - arguments, objections and proofs for them	Lecture (1 hr), seminar and discussion (0,5 hr), active learning O2
Presentations (4%)	Presenting arguments, objections and proofs for them	Practical teamwork, active learning (0,5 hr) O3, O2
Preparations for the presentation (12%)	How to prepare for a presentation and making a speech?	Lecture (1 hr), Tutorials (0,5 hr) O1, O2
Training (4%)	Practical training for making a speech	Practical teamwork, active learning (0,5 hr) O2, O3
Writing reviews (12%)	Analysis of the written and oral presentations. Writing analytical and critical reviews	Lecture (1 hr), active learning, self-study (0,5 hr) O2, O3
Analysis of written presentations (4%)	Analysis of the written and oral presentations. Writing analytical and critical reviews	Teamwork, seminar and discussion (0,5 hr) O2, O3
Projects (12%)	Preparation for defence of projects of the course	Self-study (1 hr) and Tutorial (0,5 hr) O1, O2, O3
Practical teamwork (16%)	Presentation and defence of the project of the course	Practical teamwork O1, O2, O3 (2 hr)

IV – ASSESSMENT PROCEDURE
Peer-assessment (formative) O1,O2 and O3
Teacher´s Assessment On the basis of comprehensiveness of analysis and convincingness active participation in teamworks and seminars 20 %, self-study assignments 30%, project 50%. Summative pass/fail assessment on the basis of the whole learning process.

ASSESSMENT TOOLS (ONE TABLE FOR EACH TOOL)

ASSESSMENT TOOL1

NAME	Peer-assessment
TOOL TYPE	Feedback and written (group) assignments
ASSESSMENT TYPE	Formative
IMPLEMENTATION	Participants develop a course project
DESCRIPTION	A course project
CRITERIA, RUBRICS, RATING SCALES	all the requirements of the project should be fulfilled

ASSESSMENT TOOL2

NAME	Final assessment, Teacher assessment
TOOL TYPE	Feedback and written (group) assignments
ASSESSMENT TYPE	Summative
IMPLEMENTATION	Feedback on the whole learning process, Catme freeware, paper & pencil
DESCRIPTION	Presentation of the project
CRITERIA, RUBRICS, RATING SCALES	Pass/fail assessment, participation in group works, self-study assignments fulfilled, all the requirements of the project should be fulfilled

ASSESSMENT TOOLS VERSUS OUTCOMES

TOOLS / OUTCOMES	TOOL 1 PEER-ASSESSMENT PRACTICAL WORK	TOOL1 SEMINARS	TOOL1 TEAMWORK	TOOL2 CREDIT TEACHER'S ASSESSMENT
O1	x	x		x
O2	x	x	x	x
O3	x	x	x	x

ASSESSMENT: ACHIEVED LEVEL OF LEARNING OUTCOMES (TO BE FILLED DURING OR AT THE END OF THE COURSE)

OUTCOME	NOT IMPLEMENTED	ATTEMPTED IMPLEMENTATION	MANY DEFECTS	SOME DEFECTS	MINOR DEFECTS	CORRECT	EXCEPTIONAL
OUTCOME 1							
OUTCOME 2							
…							
OUTCOME N							

Levels of outcomes' achievement correspond to:

- **Exceptional** - exceeded all goals; applied knowledge to new situations and / or solved standard problems competently
- **Correct** - achieved all objectives in a minimally competent manner; applied the knowledge and skills to known standard cases
- **Minor defects** - achieved the most important goals competently; denoted some shortcomings
- **Some defects** - reached the objectives in general computation; demonstrated some weaknesses/defects
- **Many defects** - achieved only minimum goals; demonstrated many weaknesses/defects
- **Attempted Implementation** - failed to meet minimum objectives; demonstrated some skills
- **Not Implemented** - have not demonstrated a minimally significant set of skills; violated fundamental principles of engineering science / pedagogy and / or nothing minimally acceptable was produced

NOTES (PRIVATE/RESTRICTED TO THIS FORM)

NOTES (PUBLIC/TO BE AVAILABLE ONLINE)

CONCLUSION

This deliverable serves as the basis for further development of iPET-1 courses. Based on the proposed syllabuses for each course, the consortium plans to prepare a thorough content plan for each course, as well as to develop a general presentation of course materials, including mandatory content of the lectures, structure, methodology and basic tasks for practical, project and self-study work. The proposed syllabuses will be applied within the trial iPET program training of engineering educators and will be revised, if needed, before the final launch of iPET programs.