Introduction to Engineering Project I

COURSE:	Introduction to Engineering Project I (IEP I)
TEACHERS:	Cel R/1 Vidal, Ten Cel Leila, Maj Aderson, Maj Humberto, Cap Vasconcelos, Cap Ferrari.
WORKLOAD:	45 h
CLASS SCHEDULE:	Monday, 13:10h às 16h

WORK PLAN

1. Concept

This course aims to prepare future engineers to deal with the complexities of engineering projects considering their management aspects. In this way, the project management (PM) language, the tools and the context where these tools should be applied will be demonstrated. Additionally, the students will have the opportunity to apply the project management tools in a popsicle stick bridge competition.

2. Intended Learning Outcomes of the Course

Prepare future engineers to work with general project management tools suitable for military and and civilian environments, providing them with the language and tools to develop and organize projects in a professional and modern way.

Specifically, the intended learning outcomes will be:

a) Understand and use the language of project management following the set of good practices PMBOK and NEGAPEB. The latter is the PMBOK-based model constructed and adopted by the Brazilian Army for the standardization of project management documents.

b) Apply the concepts and tools of project management in the construction of a real project plan, although simple (popsicle stick bridge competition).

c) Use project management software.

3. Teaching/learning Methods

The discipline is built using constructive alignment and active learning methods. These pedagogical techniques will support teachers to achieve the intended learning outcomes proposed for the course.

3.1. Constructive Alignment

Constructive alignment is a course-preparation technique developed by the Australian professor John Biggs[1]. It proposes that the course preparation should "align" three fundamental factors: a) learning objectives, b) teaching/learning methods and c) forms of assessment.

Considering each specific course, the teacher should be able to define no more than 5 or 6 intended learning outcomes for his/her course, using the *learning verbs* (which reflect the level of learning desired for each subject, according to the Bloom scale). Considering these outcomes, the appropriate teaching/learning methods will be chosen so that these objectives are achieved and, subsequently, the forms of assessment capable of attesting the students' level of learning.

3.2 Active Learning Methods

Active learning methods consider that education should be student-centered and not teacher-centered. The student must study/learn and the teacher must organize the course for this. This is a paradigm shift comparing to traditional classes, usually focused on preparing lectures where the teacher explains the subjects and then assess the students' learning.

A foundation that motivates the use of active methods is the William Glasser's[2] learning pyramid. It shows that in situations where the student is *active* in the discussion (discussing, doing or teaching) the rate of learning is much higher than when he is *passive* in this discussion (reading, listening, or observing). In addition to the quality of learning, the quality of classes increase as well, because they become more interesting and less boring.

Derived from these motivations, ***Problem-Based Learning*** **(PBL)** will be used as the main teaching/learning method. Additionally, several activities will be developed in the classroom to stimulate the student's interaction with the new knowledge.

4. Schedule

The course will use the *Project Management* course available for free on the VEDUCA website (https://veduca.org/apresentacao/curso/gestao-projetos), prepared by professors Marly Monteiro (USP

1a) Biggs, John B; Tang, Catherine. Teaching for quality learning at university. McGraw-Hill Education, 3rd edition, 2017.
b) Biggs, John. "Enhancing teaching through constructive alignment." Higher education 32.3 (1996): 347-364.
2Glasser, William. "Teoria da escolha: uma nova psicologia de liberdade pessoal." São Paulo: Ed. Mercuryo (2001).

Polytechnic School) and Daniel Amaral (USP of São Carlos). The activities will take place according to the following table:

Class	Date	Subject	Activities	References/Observations
1	06 Feb	Course openning		
		Pre-Discussion: Introduction to PBL		
2	19 Feb	Post-Discussion: Introduction to PBL		
		Pre-discussion: Project Management Basic Concepts		
3	26 Fev	Post-discussion: Project Management Basic Concepts		
		Pre-discussion: Integration Management		
4	05 Mar	Post-discussion: Integration Management		
		Pre-discussion: Scope Management		
5	12 Mar	Post-discussion: Scope Management		
		Pre-discussion: Schedule Management		
6	19 Mar	Post-discussion: Schedule Management		
		Pre-discussion: Cost Management		
7	26 Mar	Post-discussion: Cost Management		
		Pre-discussion: Communications Management		Executed by Ten Cel Leila
First test		Case study should be used to provide a *practical context* for the test.		
8	16 Apr	Post-discussion: Communications Management	Students must know/prepare project reports.	Executed by Ten Cel Leila

		Pre-discussion: oral expression techniques and active listening.		Executed by Ten Cel Leila
9	30 Apr	Post-discussion: oral expression techniques and active listening.		Executed by Ten Cel Leila
		Invited lecture: preparing good presentations.		
10	07 Mai	**Using project management software**		
11	14 Mai	**Guidelines for the popsicle-stick-bridge competition**		
12	21 Mai	**Preparing scientific works – Ten Cel Leila**		
13	28 Mai	**Popsicle stick bridge competition**		
14	04 Jun	**Invited lecture: a**pplying project management in the real world		
15	15 Jun	Closing		
Second test		Case study should be used to provide a *practical context* for the test.		

5. Assessment/tests

The tests will follow the normal procedures of the Institute: VC (first test), VE (intermediate evaluation) and VF (second test). In VC and VF will be used case studies on project management as the guiding line to verify the concept learning. These cases will be previously informed by the teachers and must be studied before the tests.

The VE grade will include a written test (10%), the grades of the PBL sessions (45%) and the results of the popsicle stick bridge competition (45%).

5.1. Assessment of the PBL Sessions

The pre-discussion and the post-discussion will compose the final grade for each PBL session. The students will be evaluated using the following table.

Pre-discussion	0	Absent
	0,1	Did not participate
	0,3	Normal participation

Post-discussion	0	Absent
	0,3	Did not participate

	0,5	Average participation
	0,7	Good participation
	0,8	Excellent!![3]

6. References[4]

Basic:

- CARVALHO, M. M.; AMARAL D. **Curso *Gestão de Projetos***. Disponível em: *http://veduca.org/p/gestao-de-projetos*.
- CARVALHO, M. M.; RABECHINI Jr, R. **Fundamentos em Gestão de Projetos: Construindo Competências para Gerenciar Projetos**. São Paulo: Editora Atlas, 4ª edição, 2015.

Complementary:

- CARVALHO, M. M.; RABECHINI Jr, R. Gerenciamento de Projetos na Prática: Casos Brasileiros. Vol 1 e 2.
- NEGAPEB. Normas para Elaboração, Gerenciamento e Acompanhamento de Projetos no Exército Brasileiro. EB20-N-08.001. Disponível em: http://www.portalse.eb.mil.br/images/Imagem/Nova%20pasta/nega-peb.pdf.

3The student studies much more than the recommended references and takes relevant contributions to the classmates.

4**Important observation:** these books are freely available for IME students, at the online library *Minha Biblioteca*.