General Information:

Name of Course: # FINITE ELEMENT MODELLING

Course Code: PM-TSTNB042CA
Semester: 5st
Number of Credits: 5
Allotment of Hours per Week: 2 lecture and 2 Laboratory practice /Week
Evaluation: Exam (with grade)
Prerequisites: **Structural Analysis**

Instructors: **Dr Vanda Olimpia Pomezanski, associate professor**
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Introduction, Learning Outcomes:
This course is aimed to provide basic and advanced knowledge on the principles and solution methods of the finite element method. Topics covered by the course include: General formulations and basic steps of the FEM design. Geometrical finitization, local coordinate systems, calculation of elementary matrixes, the stiffness matrix, the load vector. Controlling methods. Examples like frames, beams, grids, plates, walls, shells. Usage of an industrial code AXIS.

Methodology:
The course is based on individual engineering skills with regular consultations and presentations.

Schedule:
The semester is divided into two principle periods and attendant exercises.

The rough outline of the schedule is as follows:
Week 1: Models of 2D and 3D Truss type structures, equilibriums.
Week 2: 2D Truss with different types of supports: bar support, spring support
Week 3: The State Equation of a Truss
Week 4: The Stiffness Matrix of a Truss, 1st Test
Week 5: The Flexibility and Stiffness Matrixes of a Beam
Week 6: FE Models for simple supported beams
Week 7: 2D and 3D Frame Structures
Week 8: The Load vector, 2nd Test
Week 9: Break
Week 10: Basic mathematics for FEM
Week 11: The geometrical finitization, the shape functions
Week 12: The elementary stiffness matrixes and the structural stiffness matrixes. Local and global coordinates
Week 13: Plane surfaces like slabs or walls
Week 14: 3D elements, 3rd Test
Week 15: Summary, Exam

Studio Culture:
The course is based on through collaboration, participation and discussions trough lessons. This is an interaction between Students and Faculty; used the teaching methods like ‘Problem-based learning’ and ‘learning-by-doing’. The communication and work should be reflect a respect for fellow students and their desire to work with regard to noise levels, noxious fumes, etc – from each site of participants.

Attendance:
Attending is required all classes, and will impact the grade (max. 10%). Unexcused absences will adversely affect the grade, and in case of absence from more than 30% of the total number of lesson will be grounds for failing the class. To be in class at the beginning time and stay until the scheduled end of the lesson is required,

tardiness of more than 20 minutes will be counted as an absence. In the case of an illness or family emergency, the student must present a valid excuse, such as a doctor's note.

Evaluation + Grading
Grading will follow the course structure with the following weight:

Midterm Work 60%+Attendance 10%+ Exam 30%.

Grading Scale:

Numeric Grade:	5	4	3	2	1
	excellent	good	satisfactory	pass	fail
Evaluation in points:	91%-100%	76%-90%	61%-75%	51%-60%	0-50%

PTE Grading Policy:
Information on PTE's grading policy can be found at the following location:

Students with Special Needs:
Students with a disability and needs to request special accommodations, please, notify the Deans Office. Proper documentation of disability will be required. All attempts to provide an equal learning environment for all will be made.

Readings and Reference Materials:

- Daryl L. Logan: **A first course in the FINITE ELEMENT METHOD**, Sixth edition, SI, 2016 USA, ISBN-13: 978-1-305-63734-4