ACADEMIA ROMÂNĂ - SCOSAAR
DOCTORAL SCHOOL OF ENGINEERING, MECHANICAL, COMPUTER SCIENCES (SD-SIMC)

DISCIPLINE SHEET
2023-2024

Name of the discipline: ***Dynamic isolation at base of structures to seismic actions***
Holder of course activities: prof.univ.dr, CSI, Polidor Bratu
Year of study: I

Number of hours per week/Checking/Credits		
Course/seminar	**Form of examination**	**Credits**
44/28	Examination	30

1. **DISCIPLINE OBJECTIVES** (The objectives are formulated in terms of professional competences):

General objective of the discipline	• Understanding and ability to operate with dynamic systems for earthquake response analysis.
Specific objectives:	• Acquisition of specific knowledge and design of abutment systems at the base • Ability to analyze and optimize according to the variation of specific parameters (mass, rigidity, excitation) • Design and evaluation of dynamic and insulation models at the base

B. CONDITIONS (where applicable)

course development	•

1. SPECIFIC SKILLS ACQUIRED (Refers to the competences provided the study program to which the discipline belongs)

Professional skills	• Increased ability to solve various issues • Ability to elaborate scientific papers and experimental reports • Ability to critically interpret research results • Ability to quickly and correctly understand and evaluate new information • Ability to identify alternative solutions and ability to demonstrate/support the relevance of these alternatives
Transversal skills	• Teamwork skills • Oral and written communication skills • Respecting and developing professional values and ethics • Adaptation to new technologies, professional and personal development, through continuous training

C. CONTENT OF THE DISCIPLINE

a) Course

Chapter	Content	No. of hours
1. Seismic movement	Spectral composition of seismic signals	4
2. Building structures	Structural compliance of buildings founded directly in the field	4
3. Seismic effects	Destructive effects as a result of transmission of seismic actions on structural composition	4
4. Mitigation of effects	Methods to reduce the effects of earthquakes by insulating the construction at the base	4
5. Rheological models	Mechanical models of dynamic insulation in buildings	5
6. Rheological models	Mechanical models to dynamic insulation on bridges and viaducts	5
7. Anti-seismic devices	Anti-seismic systems and devices for base insulation	5
8. Anti-seismic devices	Physicomechanical characteristics of seismic insulation devices	5
9. Dynamic models	Dynamic models with compound rheological links	4
10. Optimization	Dynamic optimization analysis	4
	Total hours	**44**

b) Seminar – 28 Hâhours

D. EVALUATION (The methods, forms of evaluation and their weight in establishing the final grade are specified. Indicate minimum performance standards in relation to the competences defined in point **A. Objectives of the discipline**)

Activity Type	Assessment criteria	Assessment methods	Share of final grade
Course	Acquiring the knowledge gained during the course	-Oral exam	50%
Seminar	Activity	Case Studies Composite Materials	50%
The results of the discipline evaluation are expressed by the following grades: *"Very good*"; "*Okay*"; "*Satisfactory*"; "*Unsatisfactory*." The grades "*Very good*", "*Good" and "*Satisfactory*" allow the doctoral student to* obtain the credits.			

E. METHODOLOGICAL MILESTONES

Lecture combined with dialogue. Use of modern means of training (ppt). Course support.

F. CORROBORATING THE CONTENTS OF THE DISCIPLINE WITH THE EXPECTATIONS OF REPRESENTATIVES OF THE EPISTEMIC COMMUNITY, PROFESSIONAL ASSOCIATIONS AND EMPLOYERS REPRESENTATIVE IN THE FIELD RELATED TO THE PROGRAM

- The discipline provides a wide background of fundamental and practical knowledge on modern and sustainable methods of characterization of solid materials with applications in machine and machine construction, construction, transport, etc.
- The discipline provides basic elements that help the doctoral student in the specialties of mechanical engineering, industrial engineering and civil engineering

G. BIBLIOGRAPHY

1. Bratu, P. *Elastic abutment systems for machinery and equipment*, Technical Publishing House, 1990

2. Bratu, P. *Analysis of elastic systems*, Ed.Impuls, 2010

3. Ene, Gh. Pavel, C. *Introduction to vibration and noise isolation technique*, Ed. Matrixrom, 2012

4. Randall, R.Application of Bk *Equipment to freqvency analyisis*, Bruel &Kjaer, Naerum, Denmark, 1977

5. Sireteanu,T.Chiroiu, V. *Topics in Apllied Mechanics*, Ed. Academiei, 2009 .

Course holder	**Director of the Doctoral School**
prof.univ.dr, CSI, Polidor Bratu	**dr. ing.dr. CS I, Mihaiela Iliescu**