

**“DŽEMAL BIJEDIĆ” UNIVERSITY OF MOSTAR**  
**FACULTY OF CIVIL ENGINEERING**  
**CONSTRUCTION DEPARTMENT**

**Subject title:** Reliability of Structures

Semester	Status	Hours per week		ECTS credit value	Code
		Lectures	Exercises		
<b>II</b>	<b>Mandatory</b>	2	2	6	2

**Subject leader:** Asoc.Prof.dr. Rašid Hadžović, CE  
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**Subject assistant:**  
**E-mail:**

**Pre-requisites**

none

**Subject aims**

- Understanding the theory of structural safety and methods,
- Understanding and proper use of the new regulations in the construction industry,
- Design of safer and more reliable structures,

**Learning outcomes**

- Making design by probabilistic methods,
- The use of the new regulations in the construction industry, especially Eurocode 1,
- The use of statistics to determine the load on the structure,
- Calibration of existing structures and to determine their reliability.

**Indicative syllabus content:**

The meaning of the term "reliability of structures". Deterministic and probabilistic approach. Limit state equations. Determining the reliability of probabilistic concept, the legality of random distribution of size, strength and action. Probabilistic procedure for determining the reliability of structures. Methods of probabilistic procedures, levels IV, III, II and I. Dangers and risks in civil engineering. Structural data collecting. Review of the proceedings Hasofer - Lind, probability of failure. Determination of reliability index  $\beta$  - new procedures. Semi - probabilistic approach - new technical standards, the association partial factors with reliability index  $\beta$ . Calibration of existing structures. Reliability models bearing structures - methods FORM and SORM. Application area of reliability model. Reliability bearing structures in terms of usability and damage. European norms - Eurocode 1. STRUREL basic.

**Learning delivery:** The teaching process is conducted through lectures, exercises and consultations. Exercises are auditory and including making three preliminary tests in which the requirement for a second signature.

**Assessment Rationale:**

Activity in class, paper work, written and/or oral exam

**Assessment Criteria**

Lectures	Exercises	Project	Written exam	Oral exam	
%	%	%	%	%	
		15	45	40	

**Reading**

Essential	<ol style="list-style-type: none"> <li>1. Milčić V., Peroš B. (2003): „Uvod u teoriju sigurnosti nosivih konstrukcija“, Građevinski fakultet u Splitu</li> <li>2. Hadžović R., Peroš B. (2016): „Pouzdanost konstrukcija dominantno opterećenih snijegom u Bosni i Hercegovini“, Građevinski fakultet Univerziteta „Džemal Bijedić“ u Mostaru</li> </ol>
Supplementary	<ol style="list-style-type: none"> <li>1. Androić B., Dujmović D., Džeba I.(1994): „Metalne konstrukcije I i IV“, Građevinski fakultet u Zagrebu</li> <li>2. Androić B., Dujmović D., Džeba I.(1994): „Inženjerstvo pouzdanosti 1“, I.A. Projektiranje d.o.o., Zagreb</li> <li>3. Novak S.A., Collins R.K. (2000) : „Reliability of Structures“, McGraw Hill</li> <li>4. Melchers E.R. (2002): “Structural Reliability analysis and Prediction”, John Wiley and Sons</li> </ol>