Course Syllabus: Metallic Structures, Basis

Course Basic Information	
Academic Unit:	**Faculty of Civil Engineering**
Course Name:	**Metallic structures, basis**
Level:	**Bachelor**
Course Status:	**Compulsory**
Year of Study:	**III– (third)**
Number of Hours per Week:	**2+2**
ECTS Credits:	**6**
Time /Venue:	**According to the Timetable**
Course Teacher:	Mr.Sc. Ali Muriqi
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Course Description:	In the Steel constructions subject students will be familiarized with the ways of producing construction steel, types of steel used in building constructions, their main characteristics s well as the basis for their design. Design of steel objects with frame and truss structural system. Design of structural elements for different cases of internal forces. Design of joint connections and extensions of elements of structures. Basic knowledge of the stability of frame and truss systems of structures
Course Goals:	By the end of this course student will be able to design various objects including the choice and dimensions of various steel construction elements. Elemental design of metal constructions for all load cases as well structures with small element numbers. Describes, draws a explains the types of particular elements of steel structures. It lis the types of connectors, explains and calculates the specific typ of connections.
Expected Learning Outcomes:	- Student to gain general knowledge on the elements of ste constructions, - Student to gain enough knowledge for the establishment the steel structures, Student to be able to design elements as a part of steel constructions as well as the connection of such elements with proper connections.

Student Workload (Consistent with the Learning Outcomes)			
Activity	**Activity**	**Activity**	**Activity**
Lectures	2	15	30
Theory/ Lab Work/Exercises	2	15	30
Practical Work			
Consultations with the teaher	1	3	3

Field Work			
Test, seminar paper	3	2	6
Homework	2	15	30
Self-study (library or home)	2	15	30
Preparation for final exam	2	2	4
Assessment time (test, quiz, final exam)	4	2	8
Projects, presentations, etc.	1	9	9
Site Visits of the Buildings			
Student Workload			
Total			**150**

Teaching Methods:	- *Lectures with presentation and practical demonstrations of elements, materials for Structures.* - *Numerical exercises* - *Semester Seminar concrete examples.* - *intercommunication during lections.* - *Exercises on Group.*
Assessment Methods:	*During the semester is organize three colloquiums with below assignments:* - *colloquium I 10%,* - *colloquium II 10%* - *colloquium III 10%* - *presence 5%* - *home work 5%* - *design work 20%* - *Final exam 40%*
Literature	
Primary Literature:	Mr.sc.Faik Hasani (Dispatch with Authorized Lectures), FNA, Prishtina Basics of Metal Constructions by: Milosavlevic, Radojkovic, Kuzmanovic G.K.Beograd
Additional Literature:	Steel construction basis – Milosavlevic & Kumanovic. Prof. Dr. Ivica Dzeba Construction metalic –I-, FN, Zagreb Eurocode 1 and 3

Design and Teaching plan:	
Week	**Title of the Lecture**
Week 1:	***Introduction*** •*Historical development and application of metal in structures.* •*Steel material for steel structures.* •*Metallic structures in comparison to different structural materials.* ***Steel technology*** •*Industrial production of steel.* •*Metal isotropy ad homogeneity.* • *Metal types and its structural products.*
Week 2:	***Solid Steel properties*** •*Esthetic properties.* •*Physic properties.* •*Physic -mechanical properties.* • *Mechanical properties– steel strength, stress and strain.*

***Week 3*:**	***Steel structural elements*** •*Design theory - limit state.* • *Actions on structures according to the Eurocode 1.* • *Action combinations, design structural situations in accordance to the EC 1.* • *General Eurocodes base Requests for the Structure.* • *Los stability of the structural element.* • *Safety partial coefficients.* • *Numerical Examples of action combination.*
Week 4:	***Stability of the steel Structural members*** • *Axial Tension.* • *Axial Pressure.* • *Slenderness on Axial pressure elements.* • *slenderness effective lengths.* •*Numerical Examples of the structural elements.*
Week 5:	***Structural stability*** • *Bending.* •*Slope Bending.* • *Numerical Examples.*
***Week 6*:**	***Structural stability.*** •*Eccentric Pressure.* •*Eccentric tension.* • *Numerical Examples .*
Week 7:	***Connection types for steel structures*** *Alignment and construction of bolt extension beams* *-Design when the connection is only loaded with moment (M)* *-Design when the joint is only loaded with the force (Q)* *-Design when the joint is only loaded with normal force (N)*
Week 8:	***Welding as connections for steel structures*** *-Design when the connection is loaded with moment, force and normal force* *-Design of welding joint extensions in general.* *-Design of welded "head to head" joints.* *-Design of angular welded joints.*
Week 9:	***Beam joint connectors*** *-Design and construction of joints into two beams at right angles.* *-Connection when one beam rests on the other.* *-Connection with support beam at one level.*
Week 10:	***Beam to beam connection .*** *- Connection design of two beams at one level.* *-Pinned connection.* *-Fixed connection.*
***Week 11*:**	***Beam to column connection*** *-Design and construction beam to column connection.* *-Beam to column connection with the ordinary bolts.* *-Beam to column connection with the high class bolts.* *-Beam to column connection through welding process.*
***Week 12*:**	***Design of truss Joints*** • *Design and constructions of truss joints.* •*Design of truss joints with bolds as connectors.*

	•*Design of truss joints through welding as connections.* •*Design of tube truss in general.*
***Week 13*:**	***Design of members with tension connections.*** • *Design of single and double shear joint.* •*Design of splice joint.* • *Cord continuity of different members.*
***Week 14*:**	***Roof structural Design*** *-Design and construction of welded beams - selection of height (h), vertical sheet thickness (s) and web and flange thickness.* *-Stability design of the web against the bump-swelling* *- Stability design of the flange sheets in compression* *- Cord continuity of members with ordinary and high performance bolts.*
***Week 15*:**	***Footing and anchoring.*** •*Pinned footing of steel column.* • *Fixed footing of steel column.* • *Base plate anchoring with pinned and fixed column base connection*

Academic Policies and Rules of Civility:
We start and finish class on time. *Tools used during class must be cleaned and stored away at the end of class.* *Mobile/smart phones, and other electronic devices (e.g. iPods) must be turned off (or on vibrate) and hidden from view during class time.* *Laptop and tablet computers are allowed for quiet use only; other activities such as checking personal e-mail or browsing the Internet are prohibited.*