SYLLABUS

1. Course title:

Power System Dynamics

2. Code:

EEMS110

3. Cycle of study:

1

4. ECTS credits:

6

5. Type of course:

(•) Mandatory ( ) Elective

6. Prerequisites:

[EEMS002] Theory of Electrical Circuits

7. Class restrictions:

8. Duration / semester:

1 8

9. Weekly contact hours:

9.1. Lectures:	3
9.2. Seminars:	1
9.3. Laboratory/Practice classes:	1

10. Faculty:

Faculty of Electrical Engineering

11. Department/study program:

Electrical Engineering and Computer Science

12. Lecturer:

Ph.D. Mirza Kušljugić, full prof.

13. Lecturer's e-mail:

mirza.kusljugic@untz.ba

14. Web site:

15. Course aims:

Objective of the course is introduction in dynamic models of electric power systems (EPS) components and in techniques and methods for solutions and analysis of dynamic states and stability of complex EPS (dynamic systems with network structure). Voltage and frequency control impacts on dynamic processes is covered in detail. Subjects of voltage, frequency and angle stability are also described.

16. Learning outcomes:

Learning outcomes are: understanding the physical processes in a complex EES in dynamic states, especially from the stability point of view, taking into account the complex interaction between system components; to be familiar with matrix models for modeling dynamic models of EES and simulation methods for system response in dynamic state; ability to analyze dynamic response characteristics and especially electromechanical oscillations and stability of EES; understanding of the application of presented methods and procedures in real EES.

17. Course content:

Modeling of components of EPS in analysis of dynamics and stability. Voltage (reactive power) and frequency (active power) control systems. Frequency stability and emergency control. Angle (stationary, dynamic and transient) stability. Numerical techniques of angle stability models solutions. Voltage stability. Case study analysis: study of new production capacities with conventional and renewable energy sources connection to EPS.

18. Learning methods:

The following learning methods are used: lectures using multimedia tools, illustrations of using the presented methods in simple test systems, preparation and presentation of group seminar papers with students active participation and discussion, design of simple simulation programs in the Matlab environment, analysis of case studies on real EPS.

19. Assessment methods:

Written and oral exams are organized. Written exam is combination of theoretical questions and solutions of numerical problems, which were practiced during lectures and practice hours. Seminar work is an integral part of the activities that are evaluated for the final grade calculation. Final exam is composed of the discussion regarding material passed on the written exam and seminar work.

20. Assessment components:

Attendance 10%, written part of the exam - theory 50% , written part of the exam - assignments 30%, seminar work 10%.

21. Required reading list:

M. Hajro, M. Kušljugić: “Eksploatacija i upravljanje elektroenergetskim sistemom“
N. Rajaković: '' Analiza elektroenergetskih sistema I'', ''Analiza elektroenergetskih sistema II''
J.J. Grainger, W.D. Stevenson, Jr.: ''Power System Analysis''

22. Web sources:

(max. 687 characters)

23. Applicable starting from the academic year:

2016/2017

24. Adopted in the Faculty/Academy session:

04.04.2016