APPROVED BY
Director of School of Energy and Power Engineering
_____ A. S. Matveev
«_30_»_____06_____ 2020

SYLLABUS FOR

"COMPUTER, NETWORK AND INFORMATION TECHNOLOGIES"

Field of study: 13.04.02 "Electric Power and Electrical Engineering"

Program name: "Electric Generation and Transportation"

Level of study: Master

Year of admission: 2020

Semester, year: semester - 1; 2020.

ECTS: 3

Total Hours: 108

Contact Hours: 48

- **Lectures:** 8
- **Labs:** 40
- **Practical experience:** 0

Assessment: exam

Type of intermediate certification: no

Department: for Electric Power and Electrical Engineering

Head of department: of Electric Power and Electrical Engineering Department _____Ivaschutenko A.S.

Instructor: _____ Isaev Yu.N.

2020

TOMSK POLYTECHNIC UNIVERSITY ТОМСКИЙ ПОЛИТЕХНИЧЕСКИЙ УНИВЕРСИТЕТ

<table>
<tr><td>Course Objectives</td><td>
Formation of knowledge and skills in the field of calculation and design of power supply systems based on renewable energy sources are the main objectives of the discipline for students.
Objectives O1, O3 and O5 of basic educational program (BEP) “Electric Power and Electrical Engineering” will be reached as a result of learning this discipline. Achieved knowledge, skills and experience will prepare the student for:

design and engineering activity in the field of electro energy and electro technic and to be able to choose modern equipment, design new world competitive electro technical objects, systems and units using modern automated design soft, to be able evaluate technical and economical effectiveness (O1);
scientific and research activity including interdisciplinary areas such as mathematical modeling of processes and objects, to be able to do experimental research and analysis of the results, design of innovation methods increasing effectiveness of designing and operation of electrical energy systems and objects (O3);

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<tr><td>Learning Outcomes</td><td>
According to the requirements of BEP and Federal Government Educational Standard (FGES) studying the discipline “Advanced topics of power supply” is focused on formation among the students next competences (see table 1):

Constituents of the learning outcomes
<table>
<tr><td rowspan="2">Learning Outcomes</td><td colspan="5">Learning outcomes components</td></tr>
<tr><td>Code</td><td>Knowledge</td><td>Code</td><td>Skills</td><td>Code</td><td>Experience</td></tr>
<tr><td>LO 4</td><td>K 4.1</td><td>use of modern technical means and information technologies in professional field of</td><td>S 4.1</td><td>use computer technology and information technology in their professional activities</td><td>E 4.1</td><td>basic methods, methods and means of obtaining, storing and processing information</td></tr>
<tr><td>LO 7</td><td>K7.1</td><td>preparation of initial data for a given object</td><td>S 7.1</td><td>analyze information on the state of the product, the object, obtained with the help of devices</td><td></td><td></td></tr>
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				and software complexes		
	K7.3	skills in design, presentation and protection research results				
LO12	K12.2	development of technical documentation for the solution of certain tasks of a professional activities	S 12.2	analyze existing and develop independently technical documentation	E 12.2	order of development and composition scientific and technical, design documentation

Masters that have acquired the discipline should be achieved results, listed in Table 2.

Table 2

Expected results of acquiring the discipline

№	Result
CO 4	Knowledge of system and applied CAD software
CO 7	The ability to use computer technology and information technology technology in their professional activities
CO 12	Knowledge and ability to work in automated systems designing

Course Outline	Section 1. System and application software Section 2. Development of design documentation Section 3. Altium Designer package
Prerequisites	**Prerequisites** no **Corequisites**: Advanced mathematics; Professional training in English; Energy saving and energy audit of the enterprise.
Facilities and Equipment	Training audiences: Computer, video projector, interactive whiteboard. Computer classes: Computers, licensed software
Grading Policy	Assessment of the quality of the discipline in the course of the current and intermediate certification of students is carried out in accordance with the Regulations for the Intermediate Attestation of Students of the Tomsk Polytechnic University. The maximum score for the discipline in the semester is 100 points, including: • within the current control - 80 points, • for intermediate certification (exam / test) - 20 points. Assessment of the quality of the discipline is based on the results of evaluation activities.

	Evaluation activities of the current monitoring by sections and types of educational activities are given in the Appendix "Calendar rating-plan for studying discipline (module)".
Course Policy	Class attendance will be taken into consideration when evaluating students` participation in the course. Students are expected to actively engage in class discussions about the assigned readings. Attendance is strictly controlled and all class is obligatory to presence.
Teaching Aids and Resources	**Main literature.** 1. Information technology: textbook / OL Golitsyna and others - 2 nd ed., Pererab. and additional. - Moscow: Forum Infra-M, 2012. - 608 p. 2. Muromtsev D.Yu. Designing knots and devices of electronic means: textbook / D. Yu. Muromtsev, IV Tyurin, OA Belousov. - Rostov-on-Don: Phoenix, 2013. - 542 p. 3. Muromtsev D. Yu. Mathematical support of CAD: textbook / D. Yu. Muromtsev, IV Tyurin. - 2 nd ed., Pererab. and additional .. - St. Petersburg: Lan, 2014. - 464 p .: ill. **Additional literature.** 4. Voronina NA Design and Technological Design of Instrument Units and Electrical Equipment Using CAD / AN Gormakov, IV Slashchev Tutorial. - Tomsk: Publishing house of TPU, 2005. - 285 sec. (Grif Sibro UMO) 5. Slashchev I. V. Construction of printed circuit boards. Development of design documentation: a manual / IV Slashchev .- Tomsk: Publishing house of Tomsk Polytechnic University, 2006. - 172 p. 6. Voronina N.A. Design and technology of electronic devices. Printed circuit boards. / AN Gormakov. - Tomsk: Publishing house TPU, 2006. - 152 sec. 7. Koblov NN Information technologies in space instrument making. Computer-aided design and development of design documentation for the REA: educational-methodical manual / NN Koblov, AA Koptyreva, VN Borikov; National Research Tomsk Polytechnic University (TPU); Pole. - Tomsk: Publishing house TPU, 2012. - 101 p. 8. Lopatkin A. V. P-CAD 2004: the most complete guide / A. Lopatkin. - St. Petersburg: BHV-Petersburg, 2006. - 545 p. 9. Development and design of design documentation for radio electronic equipment: Handbook / E.T. Romanycheva, A. K. Ivanova, A. S. Kulikov et al .; Ed. E. T. Romanychova. - 2 nd ed., Pererab. and additional. - Moscow: Radio and Communication, 1989. - 448 p. 10. Unified system of design documentation. Basic provisions: a collection. - Official ed. - Moscow: Standartinform, 2007.-346 p .: ill. - National standards. 11. Computer networks and network technologies: Per. with English. / M. Sporak, F.C. Pappas, R. Pete and others - Kiev: DiaSoft, 2002. - 711 p. 12. Khadykin AM Designing and technology of electronic means: textbook / AM Khadykin, VA Vilshuk. - Omsk: Izd-vo OmGTU, 2008. - 110 p.
Instructor	Isaev Yusup Niyazbekovich, isaev@tpu.ru