

Name of subject	Electrical Lighting (ECTS 5)
Subject/module code	EY2605
Science taught semester (s).	6 th semester
Responsible teacher	Narimonov Bahodir Absalomovich, senior teacher
Education language	Uzbek
Connection to the curriculum	Elective
Training hours (this including independent education)	Total hours - 150 Audience Training hours - 60 Lecture hours - 30 Practical hours - 30 Independent education - 90 hours
ECTS	5
The purpose and tasks of subject / learning outcomes	The purpose and task of teaching the subject The role of the electric power industry in the rapid development of the economy is incomparable. Due to the stable operation of the energy system of Uzbekistan, the national economy is provided with uninterrupted and high-quality electric energy. This process, in turn, increases the demand for training highly qualified personnel. This program reflects the goals and objectives, content of the subject "Electrical Lighting". The purpose of studying the subject is to familiarize students with the classification, structural structure of the energy industry, requirements for lighting equipment and methods for their implementation, as well as to form skills and qualifications in the effective operation of electric lighting devices in specific operating conditions
Course content (topics)	Main theoretical part (Lecture) Topic 1: Introduction. Basic laws of lighting technology. Consumers of radiant energy and their characteristics. Topic 2: Quantities characterizing the distribution of light. Topic 3: Light properties of objects. Topic 4: Physical measurements of light. Topic 5: Physical measurements and characteristics of light Topic 6: Incandescent and gas-discharge lamps. Topic 7: Connection diagrams of modern lamps in the form of incandescent and LED. Topic 8: Parameters and connection diagrams of fluorescent, LED and gas-discharge lamps. Topic 9: Requirements for lighting equipment. Topic 10: Requirements for lighting workshops and construction sites, as well as buildings. Topic 11: Design of lighting devices and calculation of lighting devices. Topic 12: Introduction to the operation of electric lighting devices. Topic 13: Specific features of modern energy-saving lighting devices II. Instructions and recommendations for practical train. The teacher's preparation for a practical training session begins with the study of the initial documents (curriculum, thematic plan, etc.) and ends with the development of a lesson plan. The teacher should have an idea of the goals and objectives of the practical training session, the amount of work that each student must perform. Methodological guidelines are the main methodological document of the teacher in preparing and conducting practical training sessions.

	The purpose of the practical training session is to understand the theory, acquire skills. It is to consciously apply it in educational and professional activities, and to develop the ability to confidently form one's own point of view. Recommended practice topics 1. Measurement of the brightness of the immersion lamp and lamps. 2. Checking the equipment for adjusting the start-up of fluorescent LED lamps and their operation. 3. Scheme of switching on a fluorescent lamp with a pulse 4. Checking the anti-strobe effect when supplying a two-lamp circuit from one phase 7. Analysis of high-pressure mercury lamps and elements of lighting fixtures of modern energy-saving lighting devices. 8. Design of lighting fixtures and calculation of the illumination of lighting fixtures. 9. Calculation of the illumination of modern lighting fixtures. III.Independent study and independent work. Independent learning competence serves to support students' independent self-development and increase the effectiveness of professional activities. Students perform independent work on their mobile devices under the guidance of a teacher in a traditional or electronic form. Independent study for recommended topics. 1. Distribution of luminous flux by spectrum. 2. Special discharge lamps 3. Light-technical characteristics of lighting equipment 4. Selection of lighting equipment from an economic perspective. 5 Selection of lighting equipment supply scheme and network voltage 6. Operation of lighting electrical equipment. 7. Calculation of electrical lighting networks 8. Design of lighting devices and calculation of illumination of lighting devices. 9. Calculation of illumination of modern lighting devices
Exam form	Written
Teaching/learning and examination requirements	Complete mastery of theoretical and methodological concepts and practical knowledge of the discipline, the ability to correctly reflect the results of analysis, independently reason about the processes being studied and carry out tasks in the current, intermediate forms of control and independent work, pass written work on the final control. When drawing up final exam questions, deviations from the content of the discipline program are not allowed. The bank of final exam questions for each discipline is discussed at the meeting and approved by the head of the department. No later than 1 week before the start of the final control, tickets signed by the head of the department, enclosed in an envelope, are sealed by the Dean's office and opened 5 minutes before the start of the exam in the presence of students. Final exam duration is 80 minutes. Answers to final exam questions are recorded in copybooks with the seal of the Dean's office. After completion of the final work, the work is immediately encrypted by a representative of the Dean's office, and the copybooks are handed over to the commission for verification. From the moment of completion of the final exam, a period of 72 hours is allotted for checking and posting the results on the electronic platform. The teacher who taught the students in this discipline is not involved in the process of conducting the exam and checking the students' answers. Student(s) who are dissatisfied with the final exam results may

	submit a written or oral appeal within 24 hours of the publication of the final exam results. Complaints submitted after 24 hours from the publication of the final exam results will not be accepted.
Scope of assessment criteria and procedure	CURRENT CONTROL Purpose: Determining and assessing the student's level of knowledge, practical skills, and competencies on course topics. Instructions: The student's activity in daily classes is assessed through the student's mastery of course topics, as well as constructively interpreting and analyzing the educational material, developing module-specific skills, acquiring practical skills (in terms of quality and the specified number) and competencies, solving problem situations aimed at applying professional practical skills, working in a team, preparing presentations, etc. Current control form: Activity in lessons Preparing educational materials Working with sources within the subject Using educational technologies Working in a team Preparing presentations Working with projects. MIDTERM CONTROL Purpose: Assessing the student's knowledge and practical skills and level of mastery of lecture material after completing the relevant section of the course. Form and procedure of intermediate control: Midterm examination is held during the semester during the training sessions after the completion of the relevant module of the curriculum of the subject. Midterm examination is held once in written form within the framework of this subject. Midterm examination questions cover all topics of the subject. INDEPENDENT LEARNING Purpose: Independent learning is aimed at fully covering the content of this course, expanding the theoretical knowledge acquired, and establishing independent learning activities for students. Form and procedure of independent education: independent work assignments are completed in the form of an educational project, presentation, case study, problem solving, information search, digest, colloquium, essay, article, abstract, etc. Completed assignments for independent study are placed in the electronic system and checked based on the anti-plagiarism program and evaluated by the subject teacher. In this case, the uniqueness of the completed assignment should not be less than 60%, otherwise the assignment will not be accepted for assessment. The number of independent work assignments, depending on the nature of the subject, should not be less than 3 for one subject (module). Independent work assignments account for 60% of the points allocated for current and intermediate control. FINAL CONTROL Purpose: The final examination is held at the end of the semester to determine the level of mastery of the student's theoretical knowledge and practical skills in the relevant subject. The final examination is held at a specified time according to the examination schedule created by the Registrar's Office on the electronic platform. Requirements: The student must have passed the current control, intermediate control and independent learning assignments by the deadline for the final control type in the relevant subject. A student who has not passed the current control, intermediate control and independent learning assignments, as well as who has received a score in the range of "0-29.9" for these assignments and control types, is not included in the final control type. Also, a student who has missed 25 percent or more of the classroom hours allocated to a subject without a reason is excluded from this subject and is not included in the final control type and is

	considered not to have mastered the relevant credits in this subject. A student who has not passed or was not included in the final control type and has received a score in the range of "0-29.9" for this type of control is considered to be an academic debtor. Final control form: The final examination in this subject will be conducted in written form. If the final examination is conducted in written form, the requirements for assessment must also be reflected.				
Criteria for assessing student knowledge	5 grade	100 points		Assessment criteria	
	5	90-100	Excellent	When a student is considered to be able to make independent conclusions and decisions, think creatively, observe independently, apply the knowledge he has gained in practice, understand, know, express, and narrate the essence of the subject, and have an idea about the subject.	
	4	70-89,9	Good	When the student is considered to be able to observe independently, apply the knowledge he has gained in practice, understand, know, express, and narrate the essence of the subject, and has an idea about the subject.	
	3	60-69,9	Satisfactory	When the student is found to be able to apply the knowledge he has gained in practice, understands, knows, can express, and narrate the essence of the subject, and has an idea about the subject.	
	2	0-59,9	Unsatisfactory	When it is determined that the student has not mastered the science program, does not understand the essence of the subject, and does not have an idea about the science.	
Course assessment criteria and procedure	Assessment type	Total points allocated	Control (task) form	Distribution of points	Qualifying score
	Current assessment	30 points	System tasks	20 points (divided by the number of tasks)	18 points
			Student activity (in seminars, practical, laboratory classes)	10 points	
	Midterm assessment	20 points	Supervision: Written work	10 points	12 points
			System tasks	10 points (divided by the number of tasks)	
	Final assessment	50 points	Written assignment (5 questions)	50 points (10 points per question)	30 points
	* Note: 60% of the points allocated for current and intermediate control are allocated to independent work assignments. Independent work assignments are evaluated as system assignments through the electronic platform.				
Recommended Literature	Main literature: 1. Kazuo Matsuda, Yasuki Kansha, Chihiro Fushimo, Atsushi				

Tsutsumi, Akira Kishimoto. Advanced Energy Saving and its Applications in Industry. Japan – “Springer”, 2013. – 94 p.

2. Xoshimov F.A.Taslimov A.D.Energiya tejamkorligi asoslari. O‘quv qo‘llanma. – T.“Voris”, 2014 – 192 bet.

3. Аллаев К. Р.Хошимов Ф.А.Энергосбережение в промышленных предприятиях, Монография. – Т.: Фан. 2012.

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5. Сибкин Д.М, Справочник по эксплуатация электроустановок промышленных предприятий: 5-э изд., испр. и доп.- М.: Высшая школа 2002

6. Справочник по наладке электрооборудования промышленных предприятий,Под ред. М.Г. Зименкова, Г.В. Розенберга, Е.М. Фескова. – 3-э изд., перераб. и доп. – М.: Энергоатомиздат, 2003.

7. Правила устройства электроустановок (ПУЭ) / Государственная инспекция “Узэнергонадзор”. Под общ. ред. Л.Д. Ниматуллаев, Б.Т. Ташпулатова, А.Н. Усманова /MChJ «Fan-Poligraf, 2011.

8. Elektr tarmoqlari va tizimlari: O‘quv qo‘llanma/ A.M. Safarov, T.Sh. G‘oyibov, A.X. Sulliyev. O‘zbekiston Respublakasi Oliy va o‘rta maxsus ta’lim vazirligi. Toshkent. Tafakkur bo‘stoni. 2013.-224 b.

9. Gayibov T.Sh. Elektr tarmoqlari va tizimlari. O‘quv qo‘llanma. – T.: «Voris-nashriyot». 2010.

10.T.Sh. Gayibov., B.M. Pulatov., A.E. Shanazarov. “Elektr tarmoqlari va tizimlari. Misol va masalalar to‘plami”. O‘quv qo‘llanma. –Toshkent., ToshDTU, 2021-175 b.

11.T.Sh. Gayibov, H.F. Shamsutdinov, B.M. Pulatov Elektr tarmoqlari va tizimlari fanidan kurs loyihasini bajarish uchun uslubiy qo‘llanma. – Toshkent: ToshDTU, 2015-57 b.

12.Electric Power Systems/ B.M.Weedy, B.J.Cory, N.Jenkins, J.B.Ekanayake, G.Strbac.- 5th ed., UK, A John Wiley and Sons, 2012.

13. Duncan Glover, Mulucutla s. Sarma, Thomas J. Overbye. Power System Analysis and Design/Fifth edetion.- Australia, Brazil, Japan, United Kingdom, USA. CANGAGE Learning. 2010.

14. Arthur R. Bergen/ Power Systems Analysis / 2000.

15. Elektr tarmoqlari va sistemalari: uslubiy qo‘llanma/ O‘zR OO‘MTV; Rasulov A.N., Taslimov A.D., Mamarasulova F.S., Raxmonov I.U.– Toshkent: TDTU, 2014.- 90 b.

Main literature: Additional literature:

1. Mirziyoyev Sh.M. Yangi O‘zbekistonda erkin va farovon yashaylik. –T.: “TASVIR nashriyot uyi”, – 2021.– 50 b.

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11. O‘zbekiston Respublikasi Prezidentining 2022-yil 28-yanvardagi PF-60-son “2022-2026 yillarga mo‘ljallangan Yangi O‘zbekistonning taraqqiyot strategiyasi to‘g‘risida”gi Farmoni.

12. O‘zbekiston Respublikasi Prezidentining “Energiya tejoychi texnologiyalarni joriy qilish va kichik quvvatli qayta tiklanuvchi energiya manbalarini rivojlantirish bo‘yicha qo‘shimcha chora-tadbirlar to‘g‘risida”gi 09.09.2022 yildagi PF-220-son farmoni.

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17. www.gov.uz – O`zbekiston Respublikasining hukumat portali.

17. www.google.com – xalqaro o`quv materiallarini qidiruv sayti.

19. www.energystrategy.ru – “Energetika siyosati va strategiyasi” axborot portali

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21. www.twirpx.com – xalqaro o`quv materiallarini qidiruv sayti.