

COURSE DESCRIPTION CARD

| Faculty of Electrical Engineering | | | | | | | | | |
|--------------------------------------|---|---|----|---|----|----|---|---|-------------------|
| Field of study | Electrical Engineering | | | | | | | Degree level and programme type | Bachelor's Degree |
| Specialization/ diploma path | - | | | | | | | Study profile | - |
| Course name | Electric Power Transmission and Distribution | | | | | | | Course code | IS-FEE-10079S |
| | | | | | | | | Course type | elective |
| Forms and number of hours of tuition | L | C | LC | P | SW | FW | S | Semester | summer |
| | 30 | | | | | | | No. of ECTS credits | 3 |
| Entry requirements | - | | | | | | | | |
| Course objectives | The students will be able to identify major components of electric power transmission and distribution network and explain their characteristics and functions. Students will also classify power substations. | | | | | | | | |
| Course content | Introduction to power system structure, AC and DC transmission, mechanical design of OH lines, conductors, insulators, string efficiency, sag and stress, underground cables, comparison of OH and UG system, transmission line parameters - resistance, inductance and capacitance, GMR & GMD, modelling and performance of transmission lines, equivalent circuits, ABCD constants, power flow in lines, power circle diagrams, line compensation, surge-impedance loading, loadability limits, voltage regulation and transmission efficiency, distribution system, types, connected loads, distribution losses, methods of reducing power losses, anti-theft measures; breakdowns, tripping and fluctuations in distribution system, distribution transformer failures, energy efficiency monitoring and corrective measures, substation and their classification, major components of substations, importance of earthing in a substation. | | | | | | | | |
| Teaching methods | Lectures with the support of media (video) and assignments. | | | | | | | | |
| Assessment method | Assignments during the semester and a written test at the end of the semester. | | | | | | | | |
| Symbol of learning outcome | Learning outcomes | | | | | | | Reference to the learning outcomes for the field of study | |
| L01 | Understand the characteristics of AC and DC transmission and their mechanical features. | | | | | | | | |
| L02 | Know transmission line parameters and carry out related analysis, including ABCD constants | | | | | | | | |
| L03 | Understand physical and technical characteristics of distribution system and carry out related analysis and planning. | | | | | | | | |

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| LO4 | Classify substations and understand the importance of earthing. | |
| Symbol of learning outcome | Methods of assessing the learning outcomes | Type of tuition during which the outcome is assessed |
| LO1 | Assignments and test based on the lecture | L |
| LO2 | Assignments and test based on the lecture | L |
| LO3 | Assignments and test based on the lecture | L |
| LO4 | Assignments and test based on the lecture | L |
| Student workload (in hours) | | No. of hours |
| Calculation | Class attendance | 30 |
| | Assignments and self-study | 30 |
| | Preparation and write tests | 15 |
| | | |
| | | |
| | TOTAL: | 75 |
| Quantitative indicators | | HOURS |
| | | No. of ECTS credits |
| Student workload – activities that require direct teacher participation | | 30 |
| Student workload – practical activities | | 45 |
| Basic references | <ol style="list-style-type: none"> 1. L.L. Grigsby, "Electric Power Generation, Transmission, and Distribution", CRC Press, Taylor and Francis Group, 2012. 2. A.S. Pabla, "Electric Power Distribution", McGraw Hill, 2008. 3. J. Duncan Glover, Thomas J. Overbye, and Mulukutla S. Sarma, "Power System Analysis & Design, 6th Edition, Cengage Learning, 2017. | |
| Supplementary references | <ol style="list-style-type: none"> 1. T. Gonen, "Electric Power Distribution System Engineering", 3rd Edition, CRC Press, Taylor and Francis Group, 2014. 2. Hadi Saadat, "Power System Analysis", McGraw Hill Publication, 2010. 3. John J. Grainger and William D. Stevenson Jr., "Power System Analysis", McGraw Hill Inc., 1994. | |
| Organisational unit conducting the course | Department of Electrotechnics, Power Electronics and Power Engineering | Date of issuing the programme |
| Author of the programme | Andu Dukpa, PhD | 20.1.2022 |

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work,
S – seminar