

Electric power in ships

Basic Course Specification

| Course Title | Course Code | Program on which the course is given |
|---------------------------|---|--------------------------------------|
| Electrical power in ships | EE449T | Bachelor |
| Academic Year | Specialization (hr/week) | Pre-Requisites |
| 2020-2021 | <ul style="list-style-type: none"> • Theoretical (2) • Application (1) • Lab. (2) • Credit (3Cr.) | EE329T |

Overall Course Objectives

This course provides description for different parts of power systems. It introduces different types of distribution system. In addition to the basics of power system protection. This syllabus covers the requirements of the STCW-78, as amended. In particular Chapter III, Section A-III/1 for the function "Marine Engineering at the Operational Level", STCW-78, as amended. The syllabus is so designed with the guide of IMO Model course 7.04, version 2014, function 1

Course Learning Outcomes. By successful completion of the course each student will be able to:

| Topic | Linking to PLOs | Midterm Assessment | 12 th Week Assessment | Class Activities | Final Exam |
|--|-----------------|--------------------|----------------------------------|------------------|------------|
| 1. Understand the different types of distribution systems. | b, c | | | x | X |
| 2. Gain knowledge & understanding of the types & calculations of Three-phase faults. | d, f, k | x | | x | |
| 3. Gain basic knowledge about cables. | e, f | | X | x | X |
| 4. Work individually and in small groups to perform laboratory experiments / tutorial exercises in electric power systems. | a, h, i, j | | | x | X |

Course Content

| Lec./ Week # | Topic | Hrs. # | Theoretical | App. | Practical |
|--------------|---|--------|-------------|------|-----------|
| 1 | -Elements of power systems -Power System measurement | 5 | 2 | 1 | 2 |
| 2 | -DC Radial Distributors with Concentrated Loads -Power System Measurement | 5 | 2 | 1 | 2 |
| 3 | -Uniformly Loaded distributors -Voltage regulation calculation | 5 | 2 | 1 | 2 |
| 4 | -D.C. Three Wire Distributor -Voltage regulation calculation and efficiency of transmission | 5 | 2 | 1 | 2 |
| 5 | -DC Ring Distributor -Insulation measurement of transmission cable | 5 | 2 | 1 | 2 |
| 6 | -AC Radial Distributors -Transmission system parameter determination | 5 | 2 | 1 | 2 |
| 7 | -AC Ring Distributor -Loading effect for different configuration – 7 th week exam | 5 | 2 | 1 | 2 |
| 8 | -Cables | 5 | 2 | 1 | 2 |

| Course Content | | | | | |
|--|--|---|-------------|--------------|-----------|
| Lec./ Week # | Topic | Hrs. # | Theoretical | Application | Practical |
| | -Loading effect for different configuration | | | | |
| 9 | -Per-unit system. -Loading effect for different configuration | 5 | 2 | 1 | 2 |
| 10 | -Symmetrical faults -Three-Phase Short-Circuit | 5 | 2 | 1 | 2 |
| 11 | -Protection elements (1) -Relay system setting | 5 | 2 | 1 | 2 |
| 12 | -Protection elements (2) -Over current short circuit relay – 12 th week exam | 5 | 2 | 1 | 2 |
| 13 | -Protection elements (3) -Transformer Protection | 5 | 2 | 1 | 2 |
| 14 | -Protection of power system components (1) -Generator Protection | 5 | 2 | 1 | 2 |
| 15 | - Protection of power system components (2) -Induction Motor Protection | 5 | 2 | 1 | 2 |
| 16 | Final Exam. | 0 | 0 | | |
| Total Hours | | 75 | 30 | 15 | 30 |
| Teaching & Learning Methods | | Facilities Required for Teaching & Learning Methods | | | |
| <ul style="list-style-type: none"> Lectures Tutorials Reports & sheets Experiments | | <ul style="list-style-type: none"> White board and data show Videos Laboratory | | | |
| Students Assessment Methods | | | | | |
| Assessment Schedule | | | | | |
| Assessment#1 | | Week 7 | | | |
| Assessment#2 | | Week 12 | | | |
| Assessment#3 | | Week 16 | | | |
| Grading Method | | | | | |
| 7th Week Assessment | | Written Exam | | 30% | |
| 12 th week Assessment | | Written Exam | | 20% | |
| Lab/ Class Activities | | Participation and Quiz | | 10% | |
| Final Exam | | Written Exam | | 40% | |
| Total | | | | 100 % | |
| Staff Requirements | | | | | |
| Marine Chief Engineer/ Ph.D. | | | | | |
| List of References | | | | | |
| Course Notes | | Essential Books | | | |
| Lecturer notes and sheets | | <ul style="list-style-type: none"> Rohit mehta, mehta,v.k “Principles of power systems”. 9788121924962 | | | |
| Recommended Books | | Periodicals and Publications | | | |
| <ul style="list-style-type: none"> Advanced Engineering Mathematics, Erwin Kreyszig, 9th Edition-McGraw Hill | | None | | | |

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| <ul style="list-style-type: none"> • Engineering Mathematics-Programmes and Problems, K.A.Stroud, 3rd Edition-Macmillan Education | |
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IMO References

* Assessment criteria meets the standards of the STCW 78 convention "as amended" and in the light of the related IMO model courses.

Accreditation Bodies

- *Egyptian Authority for Maritime Safety (EAMS)
- *European Commission (EC)
- *ISO (9001 – 2015) DNV-GL
- *Central Evaluation and Accreditation Agency Hanover, Germany (ZEVA)
- *Ministry of Education (KSA)
- *Ministry of Higher Education (Greece)
- *Ministry of Higher Education (Oman)
- *Commission for Academic Accreditation (CAA), Ministry of higher Education (UAE)
- *University of Plymouth, United Kingdom (dual degree)

Prepared by: Course Coordinator

Reviewed by: Head of Department

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