



**NATIONAL UNIVERSITY OF ENGINEERING
COLLEGE OF MECHANICAL ENGINEERING
MECHANICAL-ELECTRICAL ENGINEERING
PROGRAM**

ML115 – ELECTRICAL CIRCUITS ANALYSIS II

I. GENERAL INFORMATION

CODE	: ML115 Electrical Circuits Analysis II
SEMESTER	: 5
CREDITS	: 5
HOURS PER WEEK	: 5 (Theory)
PREREQUISITES	: Electrical Circuit Analysis I
CONDITION	: Required

II. SUMMARY OF COURSE

Introduction: Sinusoidal Waves. Sinusoidal Alternating Current Circuits in Stable Regime. Settlement methods Alternating Current Circuits Sinusoidal steady state. Magnetically coupled circuits. Matrix Solution of Linear Electric Circuits. Three-phase circuits. Resonance.

III. COURSE OUTCOMES

The student:

1. Understands and applies complex numbers through basic operations.
2. Determines and explains the different parameters of voltage and current in a DC circuit
3. Determines, analyzes and explains the power consumed by a resistor and the power generated by a source within a DC circuit.

IV. TEACHING UNITS

1. WAVES SINUSOIDAL / 4 HOURS

StatisticsFeatures of the sine / waves as a wave AC / voltage is generated
Representación vector (phasor) of a sinusoid through complex /
Operations Numbers with phasors. Problems.

2. AC POWER CIRCUITS SINUSOIDAL REGIME IN STABLE / 12 HOURS

General / resistance R, inductance L, capacitance C, Circuit RLC series /
Transformaciones of equations integro-differential algebraic equations /
power / Laws Kirchohof in alterena current / series circuit, parallel circuit,

Admittance / series-parallel circuit / Transformations triangle -star and star-delta / Transformations star branches n / mesh Theorem maximum power transfer problems.

3. METHODS OF SETTLEMENT OF AC POWER CIRCUITS IN REGIME IN STABLE SINUSOIDAL / 12 HOURS

AC circuits solution / mesh current method / Method of nodes (nodal) / Terema Thevenin / Norton's Theorem / Overlay / Methods Chart - Analytical Problems.

4. ESTIMATE AND HYPOTHESIS TESTING / 12 HOURS

point estimate of a random / point estimators sample: mean, mean proportional, mean difference, variance / confidence intervals: mean, mean proportional and variance / error types / Hypothesis testing for the mean, variance and proportion / Hypothesis testing for two variances, average population and ratios.

5. ANALYSIS regression and correlation / 8 HOURS

Single / Scatterplot / Parameter estimation / Breakdown of total / variance coefficient of determination / estimation errors / Correlation coefficient / prediction intervals / hypothesis testing regression coefficients regression.

V. METHODOLOGY

The course is developed in theory and practice sessions. In the theory sessions, the teacher presents the concepts, theorems and applications. In the practical sessions, various problems are solved and the solution is analyzed. In all sessions active student participation is encouraged.

VI. FORMULA EVALUATION

Evaluation System "F". Calculation of Final Average: $PF = (1 + 2 EP + PROMP + EF + 1) / 4$ EP: Partial Test EF: Final Exam PROMP: Average Qualified Practice.

VII. BIBLIOGRAPHY

1. KERCHN YCORCORAN. AC circuits.
2. SCOTT. Linear Circuit (Volume 2).
3. ROBERT Boylestad: Introductory Analysis of Electrical Circuits
4. CHARLES ALEXANDER - MATTEW SADIKO: Fundamentals of Electrical Circuits

