



**DENOMINACIÓN ASIGNATURA:** Circuitos Magnéticos y Transformadores

**GRADO:** Ingeniería Eléctrica

**CURSO:** Tercero

**CUATRIMESTRE:** 1

*La asignatura tiene 29 sesiones que se distribuyen a lo largo de 14 semanas. Los laboratorios pueden situarse en cualquiera de estas ellas. Semanalmente el alumno tendrá dos sesiones, excepto en un caso que serán tres.*

**PLANIFICACIÓN SEMANAL DE LA ASIGNATURA**

WEEK	SESSION	CONTENTS	GRUPO (marcar X)		Indicar espacio distinto de aula (aula informática, audiovisual, etc.)	Examen	TRABAJO SEMANAL DEL ALUMNO		
			GRANDE	PEQUEÑO			DESCRIPCIÓN	HORAS PRESENCIALES	HORAS TRABAJO (Max semana)
1	1	Part 1: Introduction to the subject. Review of basic concepts of electricity and magnetism.		9 sep	No	NO		1,66	
1	2	Part 2: Transformer constitution. Windings. Magnetic core. Dielectrics. Cooling. Maintenance.	10 sep		No	No		1,66	7
2	3	Part 1 Problems: Calculation of flux. Calculation of self and mutual inductances.		16 sep	No	Optional T1		1,66	
2	4	Part 3: No load operation of single-phase transformers. On load operation of ideal single-phase transformers.	17 sep		No	No		1,66	7
3	5	Laboratory 1: Iron core inductances		23 sep	Lab 1.0S01	No		1,66	7

3	6	Part 3: On load operation of real Transformers. Equivalent circuits.	24 sep		No	Global. T1 y T2 or optional T2	1,66	
4	7	Part 3 Problems: Obtaining no load current of single-phase Transformers		30 sep	No	Optional T3P1	1,66	
4	8	Part 3 (Profesor Ángel Ramos): Applications of transformer equivalent circuit: Obtaining voltage regulation and efficiency.	1 oct		No	No	1,66	7
5	9	Part 3 Problems: Variation of core losses with grid frequency and voltage		7 oct	No	Optional T3P2	1,66	
5	10	Part 3: Shortcircuit currents in transformers. Inrush currents.	8 oct		No	No	1,66	7
6	11	Part 4 Problems: Three phase transformer banks from single-phase transformers.		14 oct	No	No	1,66	
6	12	Problem Exam (Parts 1 and 3)	15 oct		No	Problems	1,66	7
7	13	Part 4: Three-phase transformers. Vector groups. Parallel operation of Transformers.		21 oct	No	Global T3 or optional T3P3	1,66	7
7	14	Part 4: No load operation of three-phase transformers.	22 oct		No	No	1,66	
8	15	Laboratory 2: Phase angles. Parallel operation of three-phase Transformers.		28 oct	Lab 1.0S01	No	1,66	
8	16	Part 4: Three phase Transformers under balanced load	29 oct				1,66	7
9	17	Part 4 Problems: Obtaining the transformer equivalent circuit from no load and short circuit tests.		4 nov			1,66	
9	18	Part 4: Unbalanced loads in three phase Transformers.	5 nov			No	1,66	7
10	19	Laboratory 3: No load and short circuit tests		11 nov	Laboratorio 1.0S01	No	1,66	
10	20	Part 4: Tertiary windings. Three winding Transformers	12 nov				1,66	8
11	21	Part 4 Problema: Efficiency and voltage regulation in Transformers.		18 nov		Optional T4P1	1,66	
11	22	Part 4: Yz Transformers. Tap changers.	19 nov				1,66	8

12	23	Part 4 Problems: Parallel operation of three phase transformers. Phasor diagram.		25 nov		Optional T4P2		1,66	
12	24	Part 4 problems: Systems with multiple transformers	26 nov					1,66	8
13	25	Laboratory 4: Zero sequence impedance test		2 dic	Laboratorio 1.0S01	No		1,66	
13	26	Part 4 problems: Trasformer fed from two substations	3 dic					1,66	8
14	27	Part 4: (Profesor Angel Ramos) Autotransformers. Ventages and disadvantages of the various group conections. Life cicle in a power transformer.		9 dic				1,66	8
14	28	Part 4 problem: Three-winding transformers. Examination of theory of part 4	10 dic			Global T4 or T4P3		1,66	
<b>Subtotal 1</b>								<b>46,5</b>	<b>10</b>
<b>Total 1 (Horas presenciales y de trabajo del alumno entre las semanas 1-14)</b>								<b>149,5</b>	
15		Examination of part 4 problems.		17 dic		Problems		2	10
16		Evaluation						3	15
17									
18									
<b>Subtotal 2</b>								<b>5</b>	<b>25</b>
<b>Total 2 (Horas presenciales y de trabajo del alumno entre las semanas 15-18)</b>								<b>30</b>	
<b>TOTAL (Total 1 + Total 2. Máximo 180 horas)</b>								<b>179,5</b>	