Sapthagiri College of Engineering

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Department of Electrical and Electronics Engineering

Subject: **POWER SYSTEM PROTECTION** Subject Code: **15EE72** Academic Year: **2018-19**

Sl. No.	Syllabus	Curriculum	Deployment Strategy and Tool	Cross-cutting issues integrated	PO, PSO and CO	Attainments	Attainment Verification
1.	Power System Protection	▪ Empower students through the concepts of Power System Protection. ▪ Instruct the importance of power system as a social responsibility. ▪ Teach the students about the need for well-protected power system for overall development of a country. ▪ Create awareness in students about protection in power system for the economic development of the nation.	1. Chalk and Talk method 2. PPT	• Sustainability • Social Accountability	**PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization for the solution of complex engineering problems. **PO2: Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. **PO12: Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in	POA1: 73% POA2: 73% POA12: 73%	1. Results of Formative and Summative Assessment 2. Assignment

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					the broadest context of technological change.		
					PSO1: The application of fundamental knowledge to identify, formulate and investigate various real time problems of Electrical Machines, Power Electronics, Control System, High Voltage Engineering, Power System and Micro controller. **PSO3:** The utilization of knowledge regarding project management techniques and sustainable technologies for developing projects in various applications like Renewable energy, Power systems, High voltage Engineering, Industrial Drives and Micro controller.	PSOA1: 68% PSOA3: 73%	

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					CO1: Students will be able to discuss the components of protection schemes, relay terminologies and classification and performance of protective relays. **CO2:** Students will be able to explain about the characteristics, various schemes and different forms of overcurrent protection. **CO3:** Students will be able to explain the working of distance relays and the effects of arc resistance, power swings, line length and source impedance on performance of distance relays. **CO4:** Students will be able to discuss pilot protection and its types, construction, operating principles and performance of differential relays and protection of	COA1: 84% COA2: 93% COA3: 83% COA4: 76% COA5: 94% COA6: 94%	

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					generators, transformers and bus zone. **CO5:** Students will be able to explain the principle of circuit interruption in different types of circuit breakers. **CO6:** Students will be able to discuss the construction and operating principle of different types of fuses, protection against overvoltage and Gas Insulated Substation (GIS).		

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Curriculum Plan Diary (CPD):

Sl. No.	Date	Topic / Chapter / Module	Curriculum	Deployment Strategy and Tool	PO, PSO and CO	Attainments	Attainment Verification
1.	14-08-18 to 04-09-18	**Module–1:** **Chapter–1:** Introduction to power system protection **Chapter–2:** Relay construction and operating principles **Chapter–3:** Overcurrent Protection	▪ Empower students through the concepts of Power System Protection. ▪ Create awareness in students about protection in power system for the economic development of the nation. ▪ Teach the students about the need for well-protected power system for overall development of a country.	1. Chalk and Talk method 2. PPT	**PO1: Engineering knowledge** **PO2: Problem analysis** **PO12: Life-long learning**	POA1: 89% POA2: 89% POA12: 89%	▪ Results of Formative and Summative Assessment ▪ Assignment
					PSO1 **PSO3**	PSOA1: 89% PSOA3: 75%	
					CO1: Students will be able to discuss the components of protection schemes, relay terminologies and classification and performance of protective relays. **CO2:** Students will be able to explain about the characteristics, various schemes and different forms of overcurrent protection.	COA1: 84% COA2: 93%	
2.	05-09-18 to 27-09-18	**Module–2:** **Chapter–1:** Overcurrent	▪ Empower students through the concepts of	1. Chalk and Talk method	**PO1: Engineering knowledge** **PO2: Problem analysis**	POA1: 74% POA2: 74% POA12: 74%	▪ Results of Formative and Summative Assessment

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		protection (Continued) **Chapter–2:** Distance Protection	Power System Protection. ▪ Instruct the importance of power system as a social responsibility. ▪ Create awareness in students about protection in power system for the economic development of the nation.	2. PPT	**PO12: Life-long learning** **PSO1** **PSO3** **CO2:** Students will be able to explain about the characteristics, various schemes and different forms of overcurrent protection. **CO3:** Students will be able to explain the working of distance relays and the effects of arc resistance, power swings, line length and source impedance on performance of distance relays.	PSOA1: 74% PSOA3: 74% COA2: 93% COA3: 83%	▪ Assignment
3.	29-09-18 to 16-10-18	**Module–3:** **Chapter–1:** Pilot Relaying Schemes **Chapter–2:**	▪ Instruct the importance of power system as a social responsibility. ▪ Create awareness in	▪ Chalk and Talk method ▪ PPT	**PO1: Engineering knowledge** **PO2: Problem analysis** **PO12: Life-long learning**	POA1: 51% POA2: 51% POA12: 51%	▪ Results of Formative and Summative Assessment ▪ Assignment

		Differential Protection **Chapter–3:** Rotating machines protection **Chapter–4:** Transformer and bus zone protection	students about protection in power system for the economic development of the nation. ▪ Teach the students about the need for well-protected power system for overall development of a country.		**PSO1** **PSO3**	PSOA1: 51% PSOA3: 76%	
					CO4: Students will be able to discuss pilot protection and its types, construction, operating principles and performance of differential relays and protection of generators, transformers and bus zone.	COA4: 76%	
4.	17-10-18 to 31-10-18	**Module–4:** Circuit Breakers	▪ Instruct the importance of power system as a social responsibility. ▪ Create awareness in students about protection in power system for the economic development of the nation.	▪ Chalk and Talk method ▪ PPT	**PO1: Engineering knowledge** **PO2: Problem analysis** **PO12: Life-long learning**	POA1: 94% POA2: 63% POA12: 94%	▪ Results of Formative and Summative Assessment ▪ Assignment
					PSO1 **PSO3**	PSOA1: 63% PSOA3: 63%	

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			▪ Teach the students about the need for well-protected power system for overall development of a country.		**CO5:** Students will be able to explain the principle of circuit interruption in different types of circuit breakers.	COA5: 94%	
5.	03-11-18 to 20-11-18	**Module – 5:** **Chapter–1:** Fuses **Chapter–2:** Protection against overvoltages **Chapter–3:** Modern trends in power system protection	▪ Empower students through the concepts of Power System Protection. ▪ Teach the students about the need for well-protected power system for overall development of a country. ▪ Create awareness in students about protection in power system for the economic development of the nation.	▪ Chalk and Talk method ▪ PPT	**PO1: Engineering knowledge** **PO2: Problem analysis** **PO12: Life-long learning**	POA1: 63% POA2: 94% POA12: 63%	▪ Results of Formative and Summative Assessment ▪ Assignment
					PSO1 **PSO3**	PSOA1: 63% PSOA3: 94%	
					CO6: Students will be able to discuss the construction and operating principle of different types of fuses, protection against overvoltage and Gas Insulated Substation (GIS).	COA6: 94%	

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DEPARTMENT OF CIVIL ENGINEERING

SAPTHAGIRI COLLEGE OF ENGINEERING

CURRICULUM PLAN FOR THE ACADEMIC YEAR: ODD 2015-16 (15 SCHEME)

Sl.No.	Syllabus	Curriculum	Deployment Strategy and Tool	Cross-cutting issues integrated	PO, PSO and CO	Attainments	Attainment Verification
1.	Strength of Materials	▪ Understand the basic concepts of the stresses and strains for different materials and strength of structural elements. ▪ To know the development of internal forces and resistance mechanism for one dimensional and two dimensional structural elements ▪ Analyse and understand different internal forces and stresses induced due to representative loads on structural elements. ▪ Determine slope and deflections of beams ▪ Evaluate the behaviour of torsion members, columns and struts	1. Chalk and Talk method 2. PPT 3. YouTube video https://youtu.be/ICDZ5uLGrI4 https://youtu.be/CDK2SwS92Kk https://youtu.be/UahfUvcS24o https://youtu.be/xGPGrS-k6eo https://youtu.be/9-EZ3eyFsBk	• Business Ethics • Human values	PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems PO2: Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations. PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change	POA1:80%	1. Results of Formative and Summative Assessment 2. Assignment 3. Demonstrating through a project

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					PSO1: Expertise in Design and technical areas of Civil Engineering such as Design of RCC Structures, Design of Steel Structures, Design of Composite Structures Materials and pre-stressed concrete structures with a focus on research and innovation. **PSO2:** Ability of problem solving by adopting analytical, numerical and experimental skills with awareness of societal impact.	PSOA1:80%	
					CO1: Students will be able to evaluate the basic concepts of the stresses and strains for different materials and strength of structural elements CO2: Students will be able to evaluate the development of internal forces and resistance mechanism for one dimensional and two dimensional structural elements CO3: Students will be able to analyse different internal forces and stresses induced due to representative loads on structural elements CO4: Students will be able to evaluate slope and deflections of beams CO5: Students will be able to evaluate the behaviour of torsion members, columns and struts	PCOA1:95% PCOA2:90% PCOA3:90% PCOA4:85% PCOA5:85%	

Diary

Sl.No.	Date	Topic/Chapter/Module	Curriculam	Deployment Strategy and Tool	PO, PSO and CO	Attainments	Attainment Verification
1	**1-08-2018 to 20-08-2018**	**Module-1** Simple Stresses and Strain	Understand the basic concepts of the stresses and strains for different materials and strength of structural elements	▪ Chalk and Talk method ▪ https://youtu.be/CDK2SwS92KI	**PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems **PO2: Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.	POA1:80%	▪ Results of Formative and Summative Assessment ▪ Assignment ▪ Demonstrating through a project
					PSO2: Ability of problem solving by adopting analytical, numerical and experimental skills with awareness of societal impact	PSOA1:80%	
					CO1: Students will be able to evaluate the basic concepts of the stresses and strains for different materials and strength of structural elements	COA1:95%	

2	23-08-2018 to 10-09-2018	**Module-2** Chapter-1: Compound Stresses Chapter-2: Thin and Thick Cylinders	To know the development of internal forces and resistance mechanism for one dimensional and two dimensional structural elements	▪ Chalk and Talk method ▪ https://youtu.be/9-EZ3eyFsBk	**PO1:** Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems **PO2:** Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.	POA1:80%	▪ Results of Formative and Summative Assessment ▪ Assignment Demonstrating through a project
					PSO2: Ability of problem solving by adopting analytical, numerical and experimental skills with awareness of societal impact	PSOA1:80%	
					CO2: Students will be able to evaluate the development of internal forces and resistance mechanism for one dimensional and two dimensional structural elements	COA1:95%	

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3	14-09-2018 to 5-10-2018	**Module-3** Chapter-1: Shear Force and Bending Moment in Beams	Analyse and understand different internal forces and stresses induced due to representative loads on structural elements.	▪ Chalk and Talk method ▪ https://youtu.be/UahfUvcS24Q	PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems PO2: Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.	POA1:80%	▪ Results of Formative and Summative Assessment ▪ Assignment Demonstrating through a project
					PSO2: Ability of problem solving by adopting analytical, numerical and experimental skills with awareness of societal impact	PSOA1:80%	
					CO3: Students will be able to analyse different internal forces and stresses induced due to representative loads on structural elements	COA1:95%	

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4	10-10-2018 to 2-11-2018	**Module-4** Chapter-1: Bending and Shear Stresses in Beams Chapter-2: Torsion in Circular Shaft	Analyse and understand different internal forces and stresses induced due to representative loads on structural elements Evaluate the behaviour of torsion members,	• Chalk and Talk method https://youtu.be/xGPGrS-k6eo	PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems PO2: Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.	POA1:80%	• Results of Formative and Summative Assessment • Assignment Demonstrating through a project
					PSO2: Ability of problem solving by adopting analytical, numerical and experimental skills with awareness of societal impact	PSOA1:80%	
					CO4: Students will be able to evaluate slope and deflections of beams	COA1:95%	

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5	5-11-2018 to 28-11-2018	Module-5 Chapter-1: Deflection of Beams Chapter-2: **Columns and Struts**	Determine slope and deflection of beams Evaluate the behaviour of columns and struts	• Chalk and Talk method https://youtu.be/ICDZ5uLGrI4 •	PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems PO2: Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.	POA1:80%	• Results of Formative and Summative Assessment • Assignment Demonstrating through a project
					PSO2: Ability of problem solving by adopting analytical, numerical and experimental skills with awareness of societal impact	PSOA1:80%	
					CO5: Students will be able to evaluate the behaviour of torsion members, columns and struts	COA1:95%	

Signature of the Faculty

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CURRICULUM PLANNING -DYNAMICS OF MACHINERY (15ME52)

Sl.No.	Syllabus / Course	Curriculum	Deployment Strategy and Tool	Cross-cutting issues integrated	PO, PSO and CO	Attainments	Attainment Verification
1	Dynamics of Machinery	• Understand concept and principles behind analysis of components of mechanisms. • Analyze forces in components of mechanisms • Analyze various components of mechanisms for balancing. • Analyze various characteristics of the governor and gyroscope. • Understand the concept and types vibrations • apply principle of super position to addition of motion • Analyze free vibration of single degree of freedom systems. • Analyze forced vibration of single degree of freedom system.	1. Chalk and Talk method 2. PPT 3. YouTube videos 4.NPTEL videos	▪ Human Values ▪ Environmental issues	**PO1**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems. **PO2**: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. **PO3**:Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations **PO9**: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings. **PO12**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.	PO1-80% PO2-80% PO3- 53% PO9-53% P012- 53%	1. Results of Formative and Summative Assessment 2. Assignment 3.Course end survey
					PSO1: Expertise in specialized areas of Mechanical Engineering such as Design, Thermal, Materials and Manufacturing Engineering with a focus on research and innovation. **PSO2:** Ability of problem solving by adopting analytical, numerical and experimental skills with awareness of societal impact for mechanical engineering.	PSO1-80% PSO2-80%	
					CO 1: Analyze simple mechanisms subjected to static and dynamic force. **CO2:** Analyze the balancing of rotating and reciprocating masses. **CO3:** Analyze various characteristics of the governor and gyroscope. **CO4:** Explain the basics of vibration and apply principle of super position to addition of motion **CO5:** Analyze free vibration of single degree of freedom systems. **CO6:** Analyze forced vibration of single degree of freedom system.	CO1-83% CO2-84% CO3-85% CO4- 84% CO5- 74% CO6 - 74%	

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DYNAMICS OF MACHINERY (15ME52) D..RY

Sl.No.	Date	Topic/Chapter/Module	Curriculum	Deployment Strategy and Tool	PO, PSO and CO	Attainments	Attainment Verification
1.	1/8/18 to 29/8/18	**Module-1** Chapter1: **Static force Analysis** Chapter2: **Dynamic force Analysis**	▪ To provide concept of equilibrium and force analysis. ▪ Able to determine various forces in elements of mechanisms through graphical method ▪ Analyze static and dynamic forces in mechanisms, which is essential for design process.	▪ Chalk and Talk method ▪ PPT	PO1, PO2, PO3, PO9, PO12 PSO1, PSO2 **CO1:** Able to analyze simple mechanisms subjected to static and dynamic force	CO1-83%	▪ Results of Formative and Summative Assessment ▪ Assignment ▪ Course end survey
2.	30/8/18 to 15/9/18	**Module-3** Chapter1: **Governors** Chapter2: **Gyroscopes**	▪ To provide basic knowledge of governor and gyroscopes ▪ Analyze characteristics of different types of governors ▪ Analyze gyroscopic effects.	▪ Chalk and Talk method ▪ You tube Videos	PO1, PO2, PO3, PO9, PO12 PSO1, PSO2 **CO3:** Able to analyze various characteristics of the governor and gyroscope.	CO3-85%	▪ Results of Formative and Summative Assessment ▪ Assignment ▪ Quiz ▪ Course end survey
3.	22/9/18 to 6/10/18	**Module-2** Chapter1: **Balancing of Rotating Masses**: Chapter2: **Balancing of Reciprocating Masses**	▪ To provide concept of balancing. ▪ Draw force polygon and couple polygon and determine unknown values ▪ Analyze balancing of rotating and reciprocating masses.	▪ Chalk and Talk method ▪ You tube videos	PO1, PO2, PO3, PO9, PO12 PSO1, PSO2 **CO2:** Able to analyze the balancing of rotating and reciprocating masses.	CO2-84%	▪ Results of Formative and Summative Assessment ▪ Assignment ▪ Quiz ▪ Course end survey
4.	10/10/18 to 27/10/18	**Module-4** Chapter-1: **Introduction to vibration** Chapter-2: **Undamped free Vibrations**	▪ To provide basic knowledge of vibration. ▪ Addition of SHM analytically and graphically ▪ Apply Newton's, Energy and Raleigh methods to Analyze spring mass systems.	▪ Chalk and Talk method ▪ PPT ▪ NPTEL videos	PO1, PO2, PO3, PO9, PO12 PSO1, PSO2 **CO 4**: Able explain the basics of vibration and apply principle of super position to addition of motion **CO5:** Able to analyze free vibration of single degree of freedom systems.	CO4- 84% CO5- 74%	▪ Results of Formative and Summative Assessment ▪ Assignment ▪ Quiz ▪ Course end survey
5.	31/10/18 to 20/11/18	**Module-5** Chapter-1: **Damped free Vibrations** Chapter-2: **Forced Vibrations**	▪ To provide basic knowledge of damped and forced vibration. ▪ Analyze damping and forced vibration characteristics ▪ Apply Newton's, energy and Raleigh methods to Analyze spring mass systems.	▪ Chalk and Talk method ▪ PPT ▪ NPTEL videos	PO1, PO2, PO3, PO9, PO12 PSO1, PSO2 **CO5:** Able to analyze free vibration of single degree of freedom systems. **CO6:** Able to analyze forced vibration of single degree of freedom system.	CO6 - 74%	▪ Results of Formative and Summative Assessment ▪ Assignment ▪ Quiz ▪ Course end survey

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