

1.	Name of Course					Power system I				
2.	Course Code					JPWR1113				
	JPWR = the first alphabet identify the faculty within which the subject is offered., JPWR = the remaining three alphabet identify the course that offers the subject, 1113 = the first digit identify level of study; in this case undergraduate level, 1113 = the second and third digits identify subject identity and 1113 = the fourth digit identify credit value or credit hours									
3.	Name(s) of academic staff					To be Assigned				
4.	Rationale for the inclusion of the course/module in the programme					Knowledge of power system is essential in power engineering. Moreover, acquiring knowledge in interconnection power system enable engineer to design generation and transmission system.				
5.	Semester and Year offered					Year 3, Semester 1				
6.	Total Student Learning Time (SLT)			Face to Face				Total Guided and Independent Learning		
	L = Lecture T = Tutorial P = Practical IS= Independent Study			L	T	P	IS	Total Guided and Independent Learning = 120		
				42	7	6	65			
7.	Credit Value					3.0				
	Lecture: 3 hours per week x 14 weeks Tutorial: 1 hour per week x 7 weeks Practical: 2 hours x 3 weeks									
8.	Prerequisite (if any)					Electric circuit II				
9.	Course Objectives 1. To equip the students with the knowledge of the interconnection systems. Course Learning Outcomes (CLO) At the end of the semester students should be able to: CLO1: State the advantages and disadvantages power system; CLO2: To explain the construction of power circuit diagram and the techniques for reducing interconnected system to simple equivalents; CLO3: To explain the various types of faults that occur on generators and transformers.									
10.	Transferable Skills: This course is expected the development of the following transferable skills: ▪ An ability to manage time and task ▪ An ability to learn both independently and co—operatively; ▪ An ability to take responsibility and carry out laboratory test; ▪ An ability to take initiative and lead other; ▪ An ability to use software where relevant to the subject.									
11.	Teaching-learning and assessment strategy A variety of learning strategies are used throughout the course, including the following • Classroom Lesson; Lecturer and power point presentation • Tutorial session • Student- lecturer Discussion • Collaborative and co-operative learn; • Independent study.									

	Assessment: <table> <tr> <td>Course works</td><td>40%</td></tr> <tr> <td>Assignment</td><td>5%</td></tr> <tr> <td>Tutorial</td><td>5%</td></tr> <tr> <td>Quizzes</td><td>5%</td></tr> <tr> <td>Laboratory works</td><td>10%</td></tr> <tr> <td>Test</td><td>15%</td></tr> <tr> <td>Final Examination</td><td>60%</td></tr> <tr> <td><u>Total</u></td><td><u>100%</u></td></tr> </table>	Course works	40%	Assignment	5%	Tutorial	5%	Quizzes	5%	Laboratory works	10%	Test	15%	Final Examination	60%	<u>Total</u>	<u>100%</u>
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12.	Synopsis: This course is very important course in the field of electrical engineering. The objective of course is to equip student with the knowledge of interconnection power system.																
13.	Mode of Delivery: Lectures; Tutorials; Laboratory works																

14.	Assessment Methods and Types:						
	Performance Criteria :						
	CLO-PLO	Assessment Tool	1	2	3	4	5
	Marks		0-39	40-49	50-59	60-74	75-100
	Grade		(F)	(D,D+)	(C-,C,C+)	(B-,B,B+)	(A-,A,A+)
	CLO1: State the advantages and disadvantages power system;	Assignment Tutorials Lab works Quizzes Test Examination	Fail To: - manage time and task - learn both independently and cooperatively - take responsibility and carry out laboratory test	Poor To: - manage time and task - learn both independently and cooperatively - take responsibility and carry out laboratory test	Satisfactory To: - manage time and task - learn both independently and cooperatively - take responsibility and carry out laboratory test	Good To: - manage time and task - learn both independently and cooperatively - take responsibility and carry out laboratory test	Excellent To: - manage time and task - learn both independently and cooperatively - take responsibility and carry out laboratory test
	CLO2: To explain the construction of power circuit diagram and the techniques for reducing interconnected system to simple equivalents;	Assignment Tutorials Lab works Test Quizzes Examination	Fail To: - manage time and task - learn both independently and cooperatively - take responsibility and carry out laboratory test	Poor To: - manage time and task - learn both independently and cooperatively - take responsibility and carry out laboratory test	Satisfactory To: - manage time and task - learn both independently and cooperatively - take responsibility and carry out laboratory test	Good To: - manage time and task - learn both independently and cooperatively - take responsibility and carry out laboratory test	Excellent To: - manage time and task - learn both independently and cooperatively - take responsibility and carry out laboratory test
	CLO3: To explain the various types of faults that occur on generators and transformers;	Assignment Tutorials Lab works Quizzes Test Examination	Fail To: - manage time and task - learn both independently and cooperatively - take responsibility and carry out laboratory test	Poor To: - manage time and task - learn both independently and cooperatively - take responsibility and carry out laboratory test	Satisfactory To: - manage time and task - learn both independently and cooperatively - take responsibility and carry out laboratory test	Good To: - manage time and task - learn both independently and cooperatively - take responsibility and carry out laboratory test	Excellent To: - manage time and task - learn both independently and cooperatively - take responsibility and carry out laboratory test

15.	Mapping of the Programme Objectives to the Programme Learning Outcomes											
Programme Learning Outcomes (PLO) Programme Objectives(PO)		PLO1: Ability to acquire and apply knowledge of science and engineering fundamentals.	PLO2: Acquired in-depth technical competence in electrical engineering discipline.	PLO3: Ability to undertake problem identification, formulation and solution;	PLO4: Ability to utilise systems approach to design and evaluate operational performance.	PLO5: Understanding of the principles of design for sustainable development;	PLO6: Understanding of professional and ethical responsibilities and commitment to them.	PLO7: Ability to communicate effectively, not only with engineers but also with the community at large.	PLO8: Ability to function effectively as an individual and in a group with the capacity to be a leader or manager;	PLO9: Understanding of the social, cultural, global and environmental responsibilities of a professional engineer	PLO10: Recognising the need to undertake lifelong learning, and possessing/acquiring the capacity to do so	PLO11: Ability become entrepreneur
PEO1: To produce graduates with excellent knowledge and competency in Electrical and Electronic Engineering		✓	✓		✓			✓			✓	
PEO2: To produce graduates with professional, generic attributes to meet the present and future global demands.				✓				✓				
PEO3: To produce graduates with Islamic humanistic values and reinvention skills to meet the requirement of a dynamic environment. These skills include Civil Intelligence, Moral Intelligence, Self-Reliance and Communication Skills ;								✓				

16.	Mapping of the course Learning Outcome to the Programme Outcome											
	Programme Learning Outcomes (PLO) Course Learning Outcome (CLO)	PLO1: Ability to acquire and apply knowledge of science and engineering fundamentals.	PLO2: Acquired in-depth technical competence in electrical engineering discipline.	PLO3: Ability to undertake problem identification, formulation and solution;	PLO4: Ability to utilise systems approach to design and evaluate operational performance.	PLO5: Understanding of the principles of design for sustainable development;	PLO6: Understanding of professional and ethical responsibilities and commitment to them.	PLO7: Ability to communicate effectively, not only with engineers but also with the community at large.	PLO8: Ability to function effectively as an individual and in a group with the capacity to be a leader or manager;	PLO9: Understanding of the social, cultural, global and environmental responsibilities of a professional engineer	PLO10: Recognising the need to undertake lifelong learning, and possessing/acquiring the capacity to do so	PLO11: Ability become entrepreneur
	CLO1: State the advantages and disadvantages power system;	✓	✓		✓			✓			✓	
	CLO2: To explain the construction of power circuit diagram and the techniques for reducing interconnected system to simple equivalents;	✓	✓		✓			✓			✓	
	CLO3: To explain the various types of faults that occur on generators and transformers;	✓	✓		✓			✓			✓	

17.	Content outline of the course/module and the SLT per topic						
	Details		SLT (Hour)				
			L	T	P	IS	Total
	Topic 1	Introduction Interconnection to power system - Advantages and Disadvantages - Power circle diagram - Simple equivalent circuit - Load flow equation and problems - Rectangular and polar load-flow equations - Generate algorithms to solve load flow problems applications	12	2	-	16	30
	Topic 2	Generator and transformer fault - Generator and transformer fault - Transmission line fault - Short circuit, open circuit and earth and earth fault in lines.	6	1	-	11	18
	Topic3	Positive , negative and zero sequence components - Symmetrical and unsymmetrical fault - Switchgear - Bus-bar and fuses	6	1	-	11	18
	Topic 4	Corona Affect - Factors affecting corona - Over-load voltage - Surge voltage - Causes for surge voltage - Uniform line	6	1	-	11	18
	Topic 5	Surge impedance - Line termination - Transmission coefficient - Overhead lines cables and insulator - Line equation - Fault finding and line testing - Impulse generator	12	2	-	16	30
	Practical	1. Experiment on characteristics of impulse generator 2. Test insulators using various methods.	-	-	6	-	6
Total SLT (Hour)		42	7	6	65	120	
18.	Main references supporting the course 1. Electric power system,. By James.A. Momoh 2009. 2. Electri Power system: Design and Analysis by Mohammed El-Hawary latest ed.						
	Additional references supporting the course						
19.	Other additional information All materials will be available to the students in the library.						

