ADAMAS UNIVERSITY

PURSUE EXCELLENCE

KOLKATA

SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF ELECTRICAL ENGINEERING

B.Tech. in Electrical Machine I

Course File (Theory)

Course Code: EEE42105

Course Coordinator: Mr. Avik Datta

Year: II
Semester: III

6. **Name of the Faculty: Mr. Avik Datta** — **Course Code: EEE42105**
7. **Course** : **Electrical Engineering** — **L: 3**
8. **Program** : **B.Tech** — **T: 0**
9. **Target** : **60 %** — **P: 0**
C: 3

THEORY COURSE FILE CONTENTS

Check list Course Outcomes Attainment

S. No.	Contents	Available (Y/N/NA)	Date of Submission	Signature of HOD
1.	Authenticated Syllabus Copy	Y		
2.	Individual Time Table	Y		
3.	Students' Name List (Approved Copy)	Y		
4.	Course Plan, PO, PSO, COs, CO-PO Mapping, COA Plan, Session Plan and Periodic Monitoring	Y		
5.	Previous Year End Semester Question Papers	Y		
6.	Question Bank (All Units - Part A, Part B & C)	N		
7.	Dissemination of Syllabus and Course Plan to Students	Y		
8.	Lecture Notes - Unit I, II & III	N		
9.	**Sample Documents and Evaluation Sheet for Internal Assessment** – Tutorials / Assignments / Class Test / Open Book Test / Quiz / Project / Seminar / Role Play if any (Before Mid Term)			
10.	**Mid Term Examination** A. Question Paper / Any Other Assessment Tools Used B. Sample Answer Scripts (Best, Average, Poor) if required C. Evaluation Sheet D. Slow Learners List and Remedial Measures			
11.	Lecture Notes – Unit IV & V			
12.	**Sample Documents and Evaluation Sheet for Internal Assessment** – Tutorials / Assignments / Class Test /Open Book Test / Quiz / Project / Seminar / Role Play if any (After Mid Term)			
13.	Course End Survey (Indirect Assessment) & Consolidation			
14.	**End Term Examination** A. Question Paper & Answer Key B. Sample Answer Scripts (Best, Average, Poor) if required C. Evaluation Sheet			

Year: II

Semester: III

6. Name of the Faculty: Mr. Avik Datta **Course Code: EEE42105**

7. Course :Electrical Engineering **L: 3**

8. Program : B.Tech **T: 0**

9. Target : 60 % **P: 0**

C: 3

	D. Slow Learners List and Remedial Measures.			
15.	Content Beyond the Syllabus (Proof)			
16.	Innovative Teaching Tools Used for TLP			
17.	Details of Visiting Faculty Session / Industry Expert / Guest Lecture / Seminar / Field Visit / Webinars / Flipped Class Room / Blended Learning / Online Resources etc.			
18.	Consolidated Mark Statement			
19.	CO Attainment (Mid Term + Internal Assessment + End Term)			
20.	Gap Analysis & Remedial Measures			
21.	CO - PO Attainment			
22.	Class Record (Faculty Logbook)			

Signature of HOD/ Dean **Signature of Faculty**

Date: **Date:**

Year: II
Semester: III

6. **Name of the Faculty: Mr. Avik Datta** — **Course Code: EEE42105**
7. **Course** : **Electrical Engineering** — **L: 3**
8. **Program** : **B.Tech** — **T: 0**
9. **Target** : **60 %** — **P: 0**
C: 3

Syllabus Copy

EEE42105	Electrical Machine I	L	T	P	C
Version 1.0		3	0	0	3
Pre-requisites/Exposure	Electrical and Electronics Technology				
Co-requisites	Basic idea of electromagnetism and magnetic circuit				

Course Objectives

To prepare the students to have a basic knowledge of transformers and D.C. Machines.

Course Content

Unit 1:
Electromechanical Energy Conversion and Concepts in Rotating Machines:
8 lecture hours

Energy in magnetic systems – field energy, co energy and mechanical force – singly and multiply excited systems. Energy in magnetic system – Field energy and co-energy -force and torque equations, singly and multiply excited magnetic field systems- mmfof distributed windings,winding Inductances-, magnetic fields in rotating machines – rotating mmf waves – magnetic saturation and leakage fluxes. Concept of General terms pertaining to Rotating Machines: Electrical & Mechanical degree, Pole pitch, Coil, Generated EMF in full pitched coil, Generated EMF in a short pitched coil, EMF polygon.

Unit 2:

Fundamentals of Single Phase Transformer:

10 lecture hours

Introduction, Basics of magnetic circuits, Ampere's law, linear and nonlinear magnetic circuits, Faraday's law of electromagnet induction, concept of an ideal transformer, assumptions, ideal transformer at no load and on load, phasor diagram, basic construction of a practical single phase transformer, circuit model of a practical transformer incorporating an ideal transformer, exact and approximate equivalent circuits of a practical single phase transformer, phasor diagram.

Experimental determination of single phase transformer equivalent circuit parameters, open circuit and short circuit tests, percentage regulation, derivation, efficiency, derivation for maximum efficiency, all day efficiency, Sumpner's test.

Unit 3:

Year: II
Semester: III

6. Name of the Faculty: Mr. Avik Datta		**Course Code: EEE42105**
7. Course	**:Electrical Engineering**	**L: 3**
8. Program	**: B.Tech**	**T: 0**
9. Target	**: 60 %**	**P: 0**
		C: 3

Three-Phase Transformer:

9 lecture hours

Bank of three single phase transformers, voltage, current and kVA rating with different connections, three-phase transformer as a single unit, constructional features, comparison with a bank of three single-phase transformers, group connections and relevant phasor diagrams, polarity and terminal convention, vector groups, per phase equivalent circuit based analysis.

Unit 4:

Operation, Performance and Special Purpose of Three-Phase Transformer:

10 lecture hours

Tap changing transformer, Parallel operation of single and three-phase transformers, conditions of parallel operation, per phase equivalent circuit based analysis with equal and unequal no load voltages, load sharing,three-phase to two-phase conversion using Scott connection.

Unit 5:

DC Machines:

8 lecture hours

Constructional details of DC Machine, operating principle of DC generator ,emf equation, Lap and wave windings, types of DC generator and their circuit models, methods of excitation, armature reaction, commutation and inter-poles, compensating winding, characteristics of different type of DC generators and their applications.

Operating principle of DC motor, types of DC motors, characteristics of DC motors, speed control of DC motors, efficiency, Swinburne's test and Hopkinson's test, DC motor applications.

Text Books:

1. P. S. Bhimbra, *Electric Machines*, 2nd Ed., Khanna Publishing, 2017.
2. D. P. Kothari and I. J. Nagrath, *Electric Machines*, 4th Ed., McGraw Hill Education, 2010.
3. Charles I. Hubert, *Electric Machines: Theory, Operation, Applications, Adjustment and Control*, Pearson Education India, 2003.
4. Alexander S. Langsdorf, *Theory of Alternating Current Machinery*, McGraw Hill Education, 1984.
5. Bhag S. Guru and Huseyin R. Hiziroglu, *Electric Machinery and Transformers*, 3rdEd., Oxford University Press, 2001.

Year: II

Semester: III

6. Name of the Faculty: Mr. Avik Datta		**Course Code: EEE42105**
7. Course	**:Electrical Engineering**	**L: 3**
8. Program	**: B.Tech**	**T: 0**
9. Target	**: 60 %**	**P: 0**
		C: 3

Reference Books:

1. Irving L. Kosow, *Electric Machinery and Transformers*, 2nd Ed., Pearson Education, 2007.
2. P. K. Mukherjee and S. Chakravorti, *Electrical Machines*, DhanpatRai Publications, 2011.

Web Resources:

Year: II
Semester: III

6. Name of the Faculty: Mr. Avik Datta — Course Code: EEE42105
7. Course :Electrical Engineering — L: 3
8. Program : B.Tech — T: 0
9. Target : 60 % — P: 0
C: 3

Faculty Individual Time Table

ADAMAS UNIVERSITY, KOLKATA
SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ELECTRICAL ENGINEERING
Programme: B.Tech
Course Code & Course: EEE42105 & Electrical Machine I Faculty Coordinator: Mr. Avik Datta

Day & Time	09.30 - 10.25	10.30 – 11.25	11.30-12.25	12.30-1.30	1.30-2.25	2.30-3.25	3.30-4.25	4.30-5.25
Monday				LUNCH				
Tuesday			.					
Wednesday								
Thursday								
Friday								

Signature of HOD

Date:

Signature of Class Coordinator

Date:

Year: II
Semester: III

6. **Name of the Faculty: Mr. Avik Datta** — **Course Code: EEE42105**
7. **Course** :**Electrical Engineering** — **L: 3**
8. **Program** : **B.Tech** — **T: 0**
9. **Target** : **60 %** — **P: 0**
C: 3

Students Name List

Roll Number	Registration Number	Full Name
UG/02/BTEE/2020/001	AU-2020-0004481	Saptarshi Bhattacharjee
UG/02/BTEE/2020/002	AU/2020/0004560	Arkajyoti Das

Signature of HOD/Dean

Date:

Signature of Class Coordinator

Date:

COURSE PLAN

Target	60% (marks)
Level-1	50% (population)
Level-2	60% (population)
Level-3	70% (population)

1. Method of Evaluation

UG	PG
Internal Assessment (30%) (Quizzes/Tests, Assignments & Seminars etc.)	Internal Assessment (30%) (Quizzes/Tests, Assignments & Seminars etc.)
Mid Semester Examination (20%)	Mid Semester Examination (20%)
End Semester Examination (50%)	End Semester Examination (50%)

*Keep as per Program (UG/PG)

2. Passing Criteria

Scale	PG	UG
Out of 10 Point Scale	CGPA – "5.00" Min. Individual Course Grade – "C" Passing Minimum – 40	CGPA – "5.00" Min. Individual Course Grade – "C" Passing Minimum – 35

*Keep as per Program (UG/PG)

Year: II

Semester: III

6. **Name of the Faculty: Mr. Avik Datta** **Course Code: EEE42105**
7. **Course :Electrical Engineering** **L: 3**
8. **Program : B.Tech** **T: 0**
9. **Target : 60 %** **P: 0**

C: 3

3. **Pedagogy**
   - **Direct Instruction**
   - Kinesthetic Learning
   - **Flipped Classroom**
   - Differentiated Instruction
   - Expeditionary Learning
   - Inquiry Based Learning
   - Game Based Learning
   - Personalized Learning
4. **Topics introduced for the first time in the program through this course**
   - (New Topics Related to this Course – Syllabus Revision if any/Content Beyond Syllabus)

5. **References:**

Text Books	Web Resources	Journals	Reference Books
5	0	0	2

Signature of HOD/Dean **Signature of Faculty**

Date: **Date:**

Year: II
Semester: III

6. Name of the Faculty: Mr. Avik Datta		**Course Code: EEE42105**
7. Course	**:Electrical Engineering**	**L: 3**
8. Program	**: B.Tech**	**T: 0**
9. Target	**: 60 %**	**P: 0**
		C: 3

GUIDELINES TO STUDY THE SUBJECT

Instructions to Students:

1. Go through the 'Syllabus' in the LMS in order to find out the Reading List.
2. Get your schedule and try to pace your studies as close to the timeline as possible.
3. Get your on-line lecture notes (Content, videos) at Lecture Notes section. These are our lecture notes. Make sure you use them during this course.
4. check your LMS regularly
5. go through study material
6. check mails and announcements on blackboard
7. keep updated with the posts, assignments and examinations which shall be conducted on the blackboard
8. Be regular, so that you do not suffer in any way
9. C**ell Phones and other Electronic Communication Devices:** Cell phones and other electronic communication devices (such as Blackberries/Laptops) are not permitted in classes during Tests or the Mid/Final Examination. Such devices MUST be turned off in the class room.
10. **E-Mail and online learning tool:** Each student in the class should have an e-mail id and a pass word to access the LMS system regularly. Regularly, important information – Date of conducting class tests, guest lectures, via online learning tool. The best way to arrange meetings with us or ask specific questions is by email and prior appointment. All the assignments preferably should be uploaded on online learning tool. Various research papers/reference material will be mailed/uploaded on online learning platform time to time.
11. **Attendance:** Students are required to have minimum attendance of 75% in each subject. Students with less than said percentage shall NOT be allowed to appear in the end semester examination.

This much should be enough to get you organized and on your way to having a great semester! If you need us for anything, send your feedback through e-mail avik.datta@adamasuniversity.ac.in. Please use an appropriate subject line to indicate your message details.

There will no doubt be many more activities in the coming weeks. So, to keep up to date with all the latest developments, please keep visiting this website regularly.

Year: II
Semester: III

6. **Name of the Faculty: Mr. Avik Datta** — **Course Code: EEE42105**
7. **Course** :**Electrical Engineering** — **L: 3**
8. **Program** : **B.Tech** — **T: 0**
9. **Target** : **60 %** — **P: 0**
C: 3

RELATED OUTCOMES

1. **The expected outcomes of the Program are:**

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, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/ Development of Solutions:** 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.
PO4	**Conduct Investigations of Complex Problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
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.
PO6	**The Engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	**Environment and Sustainability:** Understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication:** Communicate effectively in complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and multidisciplinary environments.
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.

Year: II
Semester: III

6. **Name of the Faculty: Mr. Avik Datta** **Course Code: EEE42105**
7. **Course** **:Electrical Engineering** **L: 3**
8. **Program** **: B.Tech** **T: 0**
9. **Target** **: 60 %** **P: 0**
C: 3

2. The expected outcomes of the Specific Program are: (up to 3)

PSO1	Engage in analysis and design of various power system components and their applications in the field of Electrical Engineering.
PSO2	Apply the domain knowledge of Electrical Engineering to solve problems for development of society, and/ or pursue higher education and research.
PSO3	Engage in lifelong learning and adapt to changing professional and societal needs.

3. **The expected outcomes of the Course are: (minimum 4 and maximum 6)**

CO1	Acquire knowledge about the fundamental principles and classification of electromagnetic machines
CO2	Acquire knowledge about the constructional details, principle of operation, testing and applications of transformers.
CO3	Acquire knowledge about the constructional details and principle of operation of dc machines.
CO4	Acquire knowledge about the working of dc machines as generators and motors.
CO5	Acquire knowledge about testing and applications of dc machines.

4. Co-Relationship Matrix
Indicate the relationships by 1- Slight (Low) 2- Moderate (Medium) 3-Substantial (High)

Program Outcomes / Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	3	2	-	-	-	-	-	-	-	-	-	3	-	-
CO3	-	2	-	-	-	3	-	-	-	-	-	-	3	-	-
CO4	2	-	3	-	-	3	-	-	-	-	-	-	-	-	-
CO5	2	-	2	-	-	3	-	-	-	-	-	3	-	-	-
Average	**2**	**2**	**2**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**	**-**

Year: II
Semester: III

6. **Name of the Faculty: Mr. Avik Datta** — **Course Code: EEE42105**
7. **Course** :**Electrical Engineering** — **L: 3**
8. **Program** : **B.Tech** — **T: 0**
9. **Target** : **60 %** — **P: 0**, **C: 3**

5. **Course Outcomes Assessment Plan (COA):**

Course Outcomes	Internal Assessment* (30 Marks)		Mid Term Exam (20 Marks)	End Term Exam (50 Marks)	Total (100 Marks)
	Before Mid Term	After Mid Term			
CO1	7	NA	9	16	7
CO2	8	NA	8	16	8
CO3	5	4	7	16	5
CO4	5	5	10	20	5
CO5	NA	7	9	16	NA
Total	14	16	20	50	100

* Internal Assessment – Tools Used: Tutorial, Assignment, Seminar, Class Test etc.

Year: II
Semester: III

6. Name of the Faculty: Mr. Avik Datta — Course Code: EEE42105
7. Course :Electrical Engineering — L: 3
8. Program : B.Tech — T: 0
9. Target : 60 % — P: 0
C: 3

OVERVIEW OF COURSE PLAN OF COURSE COVERAGE

Course Activities:

S. No.	Description	Planned			Actual			Remarks
		From	To	No. of Session	From	TO	No. of Session	
1.	*Electromechanical Energy Conversion and Concepts in Rotating Machines*	02/09/2021	20/09/2021	08				
2.	*Fundamentals of Single Phase Transformer*	21/09/2021	01/10/2021	10				
3.	*Three-Phase Transformer*	04/10/2021	22/10/2021	09				
4.	*Operation, Performance and Special Purpose of Three-Phase Transformer*	25/10/2021	12/11/2021	10				
5.	*DC Machines*	15/11/2021	30/11/2021	08				

Total No. of Instructional periods available for the course: 45 Sessions

Signature of HOD/Dean — **Signature of Faculty**

Date: — **Date:**

Year: II
Semester: III

6. **Name of the Faculty: Mr. Avik Datta** **Course Code: EEE42105**
7. **Course :Electrical Engineering** **L: 3**
8. **Program : B.Tech** **T: 0**
9. **Target : 60 %** **P: 0**
C: 3

SESSION PLAN
UNIT-I

Session Plan				Actual Delivery			
Lect.	Date	Topics to be Covered	CO Mapped	Lect.	Date	Topics Covered	CO Achieved
1		Energy in magnetic systems – field energy, co energy and mechanical force – singly and multiply excited systems.	CO1	1			
2		mmf of distributed windings, winding Inductances	CO1	2			
3		magnetic fields in rotating machines – rotating mmf waves – magnetic saturation and leakage fluxes.	CO1	3			
4		magnetic fields in rotating machines – rotating mmf waves – magnetic saturation and leakage fluxes.(contd.)	CO1	4			
5		Electrical & Mechanical degree, Pole pitch, Coil, Generated EMF in full pitched coil	CO1	5			
6		Electrical & Mechanical degree, Pole pitch, Coil, Generated EMF in full pitched coil.(contd.)	CO1	6			
7		Generated EMF in a short pitched coil, EMF polygon.	CO1	7			

Year: II

Semester: III

6. **Name of the Faculty: Mr. Avik Datta** **Course Code: EEE42105**
7. **Course :Electrical Engineering** **L: 3**
8. **Program : B.Tech** **T: 0**
9. **Target : 60 %** **P: 0**

C: 3

8		Generated EMF in a short pitched coil, EMF polygon.(contd.)	CO1	8			

Remarks:

Signature of Faculty

Date:

Year: II
Semester: III

6. **Name of the Faculty: Mr. Avik Datta** **Course Code: EEE42105**
7. **Course :Electrical Engineering** **L: 3**
8. **Program : B.Tech** **T: 0**
9. **Target : 60 %** **P: 0**
C: 3

SESSION PLAN
UNIT-II

Session Plan				Actual Delivery			
Lect.	Date	Topics to be Covered	CO Mapped	Lect.	Date	Topics Covered	CO Achieved
1		Basics of magnetic circuits, Ampere's law, linear and nonlinear magnetic circuits, Faraday's law of electromagnet induction.	CO 2	1			CO 2
2		concept of an ideal transformer, assumptions.	CO 2	2			CO 2
3		ideal transformer at no load and on load, phasor diagram, basic construction of a practical single phase transformer.	CO 2	3			CO 2
4		circuit model of a practical transformer incorporating an ideal transformer.	CO 2	4			CO 2
5		circuit model of a practical transformer incorporating an ideal transformer.(contd.)	CO 2	5			CO 2
6		exact and approximate equivalent circuits of a practical single phase transformer, phasor diagram.	CO 2	6			CO 2
7		Experimental determination of single phase transformer equivalent circuit parameters, open circuit and short circuit tests	CO 2	7			CO 2

Year: II

Semester: III

6. **Name of the Faculty: Mr. Avik Datta** **Course Code: EEE42105**
7. **Course :Electrical Engineering** **L: 3**
8. **Program : B.Tech** **T: 0**
9. **Target : 60 %** **P: 0**

C: 3

8		percentage regulation, derivation, efficiency.	CO 2	8			CO 2
9		derivation for maximum efficiency.	CO 2	9			CO 2
10		all day efficiency, Sumpner's test.	CO 2	10			CO 2

Remarks:

Signature of Faculty

Date:

Year: II
Semester: III

6. **Name of the Faculty: Mr. Avik Datta** **Course Code: EEE42105**
7. **Course :Electrical Engineering** **L: 3**
8. **Program : B.Tech** **T: 0**
9. **Target : 60 %** **P: 0**
C: 3

SESSION PLAN
UNIT-III

Session Plan				Actual Delivery			
Lect.	Date	Topics to be Covered	CO Mapped	Lect.	Date	Topics Covered	CO Achieved
1		Bank of three single phase transformers, voltage, current and kVA rating with different connections.	CO3	1			CO3
2		three-phase transformer as a single unit, constructional features.	CO3	2			CO3
3		three-phase transformer as a single unit, constructional features(contd.)	CO3	3			CO3
4		group connections and relevant phasor diagrams, polarity and terminal convention.	CO3	4			CO3
5		group connections and relevant phasor diagrams, polarity and terminal convention (contd.)	CO3	5			CO3
6		vector groups	CO3	6			CO3
7		vector groups(contd.)	CO3	7			CO3
8		vector groups(contd.)	CO3	8			CO3

Year: II

Semester: III

6. **Name of the Faculty: Mr. Avik Datta** **Course Code: EEE42105**
7. **Course** **:Electrical Engineering** **L: 3**
8. **Program** **: B.Tech** **T: 0**
9. **Target** **: 60 %** **P: 0**

C: 3

9		per phase equivalent circuit based analysis.	CO3	9			CO3

Remarks:

Signature of Faculty

Date:

Year: II
Semester: III

6. **Name of the Faculty: Mr. Avik Datta** — **Course Code: EEE42105**
7. **Course** :**Electrical Engineering** — **L: 3**
8. **Program** : **B.Tech** — **T: 0**
9. **Target** : **60 %** — **P: 0**
C: 3

SESSION PLAN
UNIT-IV

Session Plan				Actual Delivery			
Lect.	Date	Topics to be Covered	CO Mapped	Lect.	Date	Topics Covered	CO Achieved
1		Tap changing transformer	CO4,CO5	1			CO4,CO5
2		Tap changing transformer(contd.)		2			
3		Parallel operation of single and three-phase transformers, conditions of parallel operation.	CO4,CO5	3			CO4,CO5
4		Parallel operation of single and three-phase transformers, conditions of parallel operation(contd.)	CO4,CO5	4			CO4,CO5
5		per phase equivalent circuit based analysis with equal and unequal no load voltages, load sharing.	CO4,CO5	5			CO4,CO5
6		per phase equivalent circuit based analysis with equal and unequal no load voltages, load sharing(contd.)	CO4,CO5	6			CO4,CO5
7		per phase equivalent circuit based analysis with equal and unequal no load voltages, load sharing(contd.)		7			
8		three-phase to two-phase conversion using Scott connection.	CO4,CO5	8			CO4,CO5

Year: II
Semester: III

6. **Name of the Faculty: Mr. Avik Datta** **Course Code: EEE42105**
7. **Course :Electrical Engineering** **L: 3**
8. **Program : B.Tech** **T: 0**
9. **Target : 60 %** **P: 0**
C: 3

9		three-phase to two-phase conversion using Scott connection(contd.)	CO4,CO5	9			CO4,CO5
10		three-phase to two-phase conversion using Scott connection(contd.)	CO4,CO5	10			CO4,CO5

Remarks:
Signature of Faculty

Date:

SESSION PLAN
UNIT-V

Session Plan				Actual Delivery			
Lect.	Date	Topics to be Covered	CO Mapped	Lect.	Date	Topics Covered	CO Achieved
1		Constructional details of DC Machine, operating principle of DC generator.	C05	1			C05
2		emf equation, Lap and wave windings.	C05	2			C05
3		types of DC generator and their circuit models.	C05	3			C05

Year: II
Semester: III

6. Name of the Faculty: Mr. Avik Datta — Course Code: EEE42105
7. Course :Electrical Engineering — L: 3
8. Program : B.Tech — T: 0
9. Target : 60 % — P: 0
C: 3

4		methods of excitation, armature reaction.	C05	4			C05
5		commutation and inter-poles, compensating winding.	C05	5			C05
6		characteristics of different type of DC generators and their applications.	C05	6			C05
7		Operating principle of DC motor, types of DC motors, characteristics of DC motors, speed control of DC motors, efficiency, Swinburne's test and Hopkinson's test.	C05	7			C05
8		DC motor applications.	C05	8			C05

Remarks:
Signature of Faculty

PERIODIC MONITORING

Actual date of completion and remarks, if any

Components		From	To	From	To
Duration (Mention from and to Dates)					
Percentage of Syllabus covered		55 %		45 %	
Lectures	Planned	1	33	34	60
	Taken				
Tutorials	Planned	NA			
	Taken				
Test/Quizzes/ Mid Semester/ End Semester	Planned				
	Taken				
	CO's Addressed	CO1, CO2, CO3	CO1, CO2, CO3	CO4, CO5	CO4, CO5
	CO's Achieved	CO1, CO2, CO3	CO1, CO2, CO3	CO4, CO5	CO4, CO5
Assignments	Planned	2	2	2	2
	Taken	2	2	2	2

Year: II

Semester: III

6. Name of the Faculty: Mr. Avik Datta — Course Code: EEE42105
7. Course :Electrical Engineering — L: 3
8. Program : B.Tech — T: 0
9. Target : 60 % — P: 0
C: 3

	CO's Addressed	CO1, CO2, CO3	CO1, CO2, CO3	CO4, CO5	CO4, CO5
	CO's Achieved				
Signature of Faculty					
Head of the Department					
OBE Coordinator					

Signature of HOD/ Dean

Date

Signature of Faculty

Date

Year: II
Semester: III

6. Name of the Faculty: Mr. Avik Datta — Course Code: EEE42105
7. Course :Electrical Engineering — L: 3
8. Program : B.Tech — T: 0
9. Target : 60 % — P: 0
C: 3

PERIODIC MONITORING

Attainment of the Course (Learning) Outcomes:

Components	Attainment level	Action Plan	Remarks
Assignment	CO1:		
	CO2:		
	CO3:		
	CO4:		
	CO5:		
	CO6:		
Quiz/Test etc.	CO1:		
	CO2:		
	CO3:		
	CO4:		
	CO5:		
	CO6:		
Mid Semester	CO1:		
	CO2:		
	CO3:	--	
	CO4:	--	
	CO5:	--	
	CO6:	--	
End Semester	CO1:		
	CO2:		
	CO3:		
	CO4:		
	CO5:		
	CO6:		
Any Other	CO1:	NA	
	CO2:		
	CO3:		
	CO4:		

Year: II

Semester: III

6. **Name of the Faculty: Mr. Avik Datta** — **Course Code: EEE42105**
7. **Course** :**Electrical Engineering** — **L: 3**
8. **Program** : **B.Tech** — **T: 0**
9. **Target** : **60 %** — **P: 0**, **C: 3**

	CO5:	
	CO6:	

Signature of HOD/ Dean

Date

Signature of Faculty

Date

Year: II
Semester: III

6. Name of the Faculty: Mr. Avik Datta — Course Code: EEE42105
7. Course :Electrical Engineering — L: 3
8. Program : B.Tech — T: 0
9. Target : 60 % — P: 0
C: 3

Previous Year Question Papers – Set 1

Year: II
Semester: III

6. Name of the Faculty: Mr. Avik Datta — Course Code: EEE42105
7. Course :Electrical Engineering — L: 3
8. Program : B.Tech — T: 0
9. Target : 60 % — P: 0
C: 3

Previous Year Question Papers – Set 2

Year: II

Semester: III

6. Name of the Faculty: Mr. Avik Datta — Course Code: EEE42105
7. Course :Electrical Engineering — L: 3
8. Program : B.Tech — T: 0
9. Target : 60 % — P: 0
C: 3

Lecture Notes – Sample

Year: II

Semester: III

6. Name of the Faculty: Mr. Avik Datta — Course Code: EEE42105
7. Course :Electrical Engineering — L: 3
8. Program : B.Tech — T: 0
9. Target : 60 % — P: 0
C: 3

COURSE END SURVEY

INDIRECT ASSESSMENT

INDIRECT ASSESSMENT CONSOLIDATION

Evaluation Sheet (End Semester)

Signature of HOD/Dean — Signature of Faculty

Date: — Date:

Year: II
Semester: III

6. Name of the Faculty: Mr. Avik Datta — Course Code: EEE42105
7. Course :Electrical Engineering — L: 3
8. Program : B.Tech — T: 0
9. Target : 60 % — P: 0
C: 3

Consolidated Mark Statement

Signature of Dean/HOD

Date:

Signature of Faculty

Date:

Year: II

Semester: III

6. Name of the Faculty: Mr. Avik Datta — Course Code: EEE42105
7. Course :Electrical Engineering — L: 3
8. Program : B.Tech — T: 0
9. Target : 60 % — P: 0
C: 3

CO ATTAINMENT – GAP ANALYSIS & REMEDIAL MEASURES

Signature of HOD/Dean **Signature of Faculty**

Date: **Date:**

CO-PO ATTAINMENT

Signature of HOD/Dean **Signature of Faculty**

Date: **Date:**

PO ATTAINMENT OF THE COURSE

Signature of HOD/Dean **Signature of Faculty**

Date: **Date:**

Year: II
Semester: III

6. **Name of the Faculty: Mr. Avik Datta** — **Course Code: EEE42105**
7. **Course** : **Electrical Engineering** — **L: 3**
8. **Program** : **B.Tech** — **T: 0**
9. **Target** : **60 %** — **P: 0**
C: 3

INSTRUCTIONS FOR FACULTY

Instructions for Faculty

- Faculty should keep track of the students with low attendance and counsel them regularly.
- Course coordinator will arrange to communicate the short attendance (as per University policy) cases to the students and their parents monthly.
- Topics covered in each class should be recorded in the table of RECORD OF CLASS TEACHING (Suggested Format).
- Internal assessment marks should be communicated to the students twice in a semester.
- The file will be audited by respective Academic Monitoring and Review Committee (AMRC) members for theory as well as for lab as per AMRC schedule.
- The faculty is required to maintain these files for a period of at least three years.
- This register should be handed over to the head of department, whenever the faculty member goes on long leave or leaves the Colleges/University.
- For labs, continuous evaluation format (break-up given in the guidelines for result preparation in the same file) should be followed.
- Department should monitor the actual execution of the components of continuous lab evaluation regularly.
- Instructor should maintain record of experiments conducted by the students in the lab weekly.
- Instructor should promote students for self-study and to make concept diary, due weightage in the internal should be given under faculty assessment for the same.
- Course outcome assessment: To assess the fulfilment of course outcomes two different approaches have been decided. Degree of fulfillment of course outcomes will be assessed in different ways through direct assessment and indirect assessment. In Direct Assessment, it is measured through quizzes, tests, assignment, Mid-term and/or End-term examinations. It is suggested that each examination is designed in such a way that it can address one or two outcomes (depending upon the course completion). Indirect assessment is done through the student survey which needs to be designed by the faculty (sample format is given below) and it shall be conducted towards the end of course completion. The evaluation of the achievement of the Course Outcomes shall be done by analyzing the inputs received through Direct and Indirect Assessments and then corrective actions suggested for further improvement.
- **Submission Targets of Course Contents:**
  - **S. No. 1 to 8 : Before Starting the Course**
  - **S. No. 9 & 10 : After Mid Semester Examination**
  - **S. No. 11 to 18 : Immediately After End Semester Examination**
  - **S. No. 19 to 22 : After Declaration of Result of the Course**