



COLLEGE OF ENGINEERING BHUBANESWAR

Plot No.1 (A), CNI Complex, Patia, Bhubaneswar – 751024, Odisha, India.

[AFFILIATED TO BPUT, ODISHA]

www.coeb.ac.in

DEPARTMENT OF AUTOMOBILE ENGINEERING

Name of the course : Add-on course on Electric and Hybrid Vehicles
Course code :
Branch : Automobile
Semester : 5th
Duration : 40 hours

Learning Objective:

- ❖ Able to understand the basics of electric and hybrid electric vehicles, their architecture, technologies and fundamentals.
- ❖ To provide students an understanding of the hybrid electric vehicle architecture, design and component sizing and the power electronics devices used in hybrid electric vehicles.
- ❖ Explore the knowledge of energy storage technologies used for hybrid electric vehicles and their control.
- ❖ To provide students a general idea and gain confidence and enhance their knowledge new field of electric and hybrid vehicles

Course Outcome:

After completion of course the students will be able to:

- ❖ CO1: Understand the architecture and vehicle dynamics of electric and hybrid vehicles.
- ❖ CO2: Analyze and model the power management systems for electric and hybrid vehicles
- ❖ CO3: Devise power electronics-based control strategies for electric and hybrid vehicles
- ❖ CO4: Investigate and model the issues in mathematical domain related to grid interconnections of electric and hybrid vehicle.

SYLLABUS

MODULE 1:

(14 hours)

Introduction to Electric Vehicle (EV) & Hybrid Vehicle(HV): A brief history of Electric and Hybrid vehicles, basic architecture of hybrid drive train and analysis of series drive train., vehicle motion and the dynamic equations for the vehicle, types of HV and EV, advantages over conventional vehicles, limitations of EV and HV, impact on environment of EV and HV technology, disposal of battery, cell and hazardous material and their impact on environment.

MODULE 2:

(14 hours)

Power and Energy management strategies and its general architecture of EV and HV, various battery sources, energy storage, battery based energy storage and simplified models of

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battery, Battery Management Systems (BMS), fuel cells, their characteristics and simplified models,

Super capacitor based energy storage, its analysis and simplified models, flywheels and their modeling for energy storage in HV/BEV.

MODULE 3:

(12 hours)

Components & Design Considerations of EV & HV: Design parameters of batteries, ultra-capacitors and fuel cells, aerodynamic considerations, calculation of the rolling resistance and the grade resistance, calculation of the acceleration force, total tractive effort, torque required on the drive wheel.

Text Book:

1. Modern Petroleum Technology, Vol 1, Upstream, Ed. by Richard A. Dave, IP, 6th ed., John Wiley & Sons. Ltd.
2. Modern Petroleum Technology, Vol 2, Downstream, Ed. by Alan G. Lucas, IP, 6th ed., John Wiley & Sons. Ltd.
3. Combustion, Irvin Glassman, 2nd ed., Academic Press.

Reference Text Book:

1. Iqbal Hussain, "Electric and Hybrid Vehicles Design Fundamentals", 1st Edition, CRC Press, 2003.
2. James Larminie, John Lowry "Electric Vehicle Technology Explained"; 1st Edition, John Wiley and Sons, 2003.
3. Chris Mi, M. Abul Masrur, David Wenzhong Gao, "Hybrid Electric Vehicles: Principles and Applications with Practical Perspectives", Wiley publication, 2011.

Online resources:

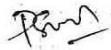
1. Web course on "Introduction to Hybrid and Electric Vehicles" by Dr. Praveenkumar and Prof. S Majhi, IIT Guwahati available on NPTEL at <https://nptel.ac.in/courses/108/103/108103009/>
2. Video Course on "Electric Vehicles" by Prof. Amitkumar Jain, IIT Delhi available on NPTEL at <https://nptel.ac.in/courses/108/102/108102121/>

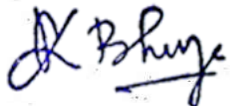
Evaluation Criteria

- Mandatory attendance of 75% for each student.
- Conduction of two internal assessments and students have to secure 50% marks in each assessment.
- Certificates will be awarded to each students fulfilling the above criteria.

Designed & developed by: Dr. Krishna & Prof. Asis Kumar Nayak

Approved by:




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Plot No.1 (A), CNI Complex, Patia, Bhubaneswar – 751024, Odisha, India.

NOTICE

Department of Automobile Engineering Add On Course 2021-2022

Ref No: COEB/AE/2021/08

Date: 22.11.2021

It is hereby informed to all the students that the Department of Automobile Engineering is going to start the following Add-on courses for Academic year 2021-2022. All the students are instructed to enroll their names for the following courses on or before **30.11.2021**. The classes will be commenced from **06/12/2021** during 5.30pm to 7.30pm. You can contact the following course co-ordinators for enrolment and any queries.

Sl No.	Name of Add-on Course	Sem	Duration in hours	Name of the course co-ordinators
1.	Automotive Testing and Certification	3 rd	40	Prof. <i>ABIS. Kumar Nayak</i>
2.	Electric and hybrid vehicles	5 th	40	Prof. Jagannath Mohapatra
3.	CATIA V5	7 th	40	Dr. Sujit Kumar Khuntia

HOD

Automobile Engineering Department

Copy to:

1. Vice Chairman
2. Executive Director
3. Principal
4. All Notice Board.
5. A.O(Admin)
6. All HODs
7. Hostel, Security

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DEPARTMENT OF AUTOMOBILE ENGINEERING ADD ON/CERTIFICATE COURSE STUDENT ENROLLMENT SHEET

Programme: B Tech in AUTOMOBILE ENGINEERING		Academic Year : 2021-22
Semester: 5 th	Course Code (if any):	Course Duration: 40 hours
Name of the Course: Electric and Hybrid Vehicles		

I do hereby undertake to participate in the above mentioned add on course.

Sl No.	Reg. No.	Name of the Students	Signature
1	1901219001	ABHISEK SAHOO	Abhisek Sahoo
2	1901219002	ANURAG DAS	Anurag Das
3	1901219003	DEBASHISH MALLICK	Debashish Mallik
4	1901219004	PABITRA KUMAR JENA	Pabitra K. Jena
5	1901219005	PRIYABRATA PARIDA	Priyabrata Parida
6	1901219006	RAJENDRA KUMAR BAL	Rajendra Bal
7	1901219007	SHREE SONU NAIK	Shree Sonu Naik
8	1901219008	SOUBHAGYA MAHAPATRA	Soubhagya Mahapatra
9	1901219009	SANJEET RAUTARAY	Sanjeet Rautaray
10	1901219156	ABHIMILAN MUTHAMAJHI	A. Muthumajhi
11	1901219157	ANISH SUBHADARSHI	A. Subhadarshi
12	1901219158	DEEP SHANKAR	Deep Shankar
13	1901219159	DINESH KUMAR MOHANTY	Dinesh Kumar Mohanty
14	1901219160	ISWAR CHANDRA GHADEI	Iswar Ch. Ghadei
15	1901219161	MANOJ KUMAR KISHAN	Manoj K. Kishan
16	1901219162	ROHIT KUMAR RAWANI	Rohit Rawani
17	1901219163	SATYA NARAYAN BISOYI	Satya Narayan Bisoyi
18	1901219164	SHYAM SUNDAR SOREN	Shyam Sundar Soren
19	1901219165	SOUBHAGYA RANJAN	S. Ranjan
20	1901219166	SUNIL DAS	Sunil Das




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DEPARTMENT OF AUTOMOBILE ENGINEERING
ADD ON/CERTIFICATE COURSE
STUDENT ATTENDANCE SHEET

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Programme: B Tech in AUTOMOBILE ENGINEERING		Semester: 5 th		Academic Year : 2021-22		Sheet No:	
Name of the Course: Electric and Hybrid vehicles		Course Code (if any):					
Sl No.	Reg. No.	Name of the Students	Date	Date	Date	Date	Date
1	1901219001	ABHISEK SAHOO	07/12/21	08/12/21	09/12/21	09/12/21	09/12/21
2	1901219002	ANURAG DAS	Abhisek Sahoo	Abhisek Sahoo	Abhisek Sahoo	Abhisek Sahoo	Abhisek Sahoo
3	1901219003	DEBASHISH MALLICK	Anurag Das	Anurag Das	ABS	Anurag Das	Anurag Das
4	1901219004	PABITRA KUMAR JENA	Debashish Mallik	Debashish Mallik	ABS	Debashish Mallik	Debashish Mallik
5	1901219005	PRIVABRATA PARIDA	Pabitra Mr. Jena	Pabitra Mr. Jena	ABS	Pabitra Mr. Jena	Pabitra Mr. Jena
6	1901219006	RAJENDRA KUMAR BAL	Priyabrata Parida	Priyabrata Parida	Priyabrata Parida	Priyabrata Parida	Priyabrata Parida
7	1901219007	SHREE SONU NAIK	Rajendra Bal	Rajendra Bal	Rajendra Bal	Rajendra Bal	Rajendra Bal
8	1901219008	SUBHAGYA MAHAPATRA	Shree Sonu Naik	Shree Sonu Naik	Shree Sonu Naik	Shree Sonu Naik	Shree Sonu Naik
9	1901219009	SANJEET RAUTARAY	Soubhagya Mahapatra	Soubhagya Mahapatra	Soubhagya Mahapatra	Soubhagya Mahapatra	Soubhagya Mahapatra
10	1901219156	ABHIMILAN MUTHAMAJHI	Sanjeet Rautaray	Sanjeet Rautaray	Sanjeet Rautaray	Sanjeet Rautaray	Sanjeet Rautaray
11	1901219157	ANISH SUBHADARSHI	A. Muthamajhi	A. Muthamajhi	A. Muthamajhi	A. Muthamajhi	A. Muthamajhi
12	1901219158	DEEP SHANKAR	A. Subhadarshi	A. Subhadarshi	A. Subhadarshi	A. Subhadarshi	A. Subhadarshi
13	1901219159	DINESH KUMAR MOHANTY	Deep Shankar	Deep Shankar	Deep Shankar	Deep Shankar	Deep Shankar
14	1901219160	ISWAR CHANDRA GHADAI	Dinesh Kumar Mohanty	Dinesh Kumar Mohanty	Dinesh Kumar Mohanty	Dinesh Kumar Mohanty	Dinesh Kumar Mohanty
15	1901219161	MANOJ KUMAR KISHAN	Iswar Ch. Ghadei	Iswar Ch. Ghadei	Iswar Ch. Ghadei	Iswar Ch. Ghadei	Iswar Ch. Ghadei
16	1901219162	ROHIT KUMAR RAWANI	Manoj Kumar Kishan	Manoj Kumar Kishan	Manoj Kumar Kishan	Manoj Kumar Kishan	Manoj Kumar Kishan
17	1901219163	SATYA NARAYAN BISOYI	Rohit Rawani	Rohit Rawani	Rohit Rawani	Rohit Rawani	Rohit Rawani
18	1901219164	SHYAM SUNDAR SOREN	Satya Narayan Bisoyi	Satya Narayan Bisoyi	Satya Narayan Bisoyi	Satya Narayan Bisoyi	Satya Narayan Bisoyi
19	1901219165	SUBHAGYA RANJAN SETHY	Shyam Sunder Soren	Shyam Sunder Soren	Shyam Sunder Soren	Shyam Sunder Soren	Shyam Sunder Soren
20	1901219166	SUNIL DAS	Soubhagya R. Sethy	Soubhagya R. Sethy	Soubhagya R. Sethy	Soubhagya R. Sethy	Soubhagya R. Sethy



Manoj Kumar Kishan

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Programme: B Tech in AUTOMOBILE ENGINEERING		Semester: 5 th		Academic Year : 2021-22		Sheet No:	
Name of the Course: Electric and Hybrid vehicles		Course Code (if any):					
Sl No.	Reg. No.	Name of the Students	Date	Date	Date	Date	Date
1	1901219001	ABHISEK SAHOO	10/12/21	13/12/21	14/12/21	15/12/21	
2	1901219002	ANURAG DAS	Abhishek Sahoo	Anurag Das	Abhishek Sahoo	Abhishek Sahoo	ABC
3	1901219003	DEBASHISH MALLICK	Debashish mallick	Debashish mallick	Debashish mallick	Debashish mallick	
4	1901219004	PABITRA KUMAR JENA	Pabitra Kumar Jena	Pabitra Kumar Jena	Pabitra Kumar Jena	Pabitra Kumar Jena	
5	1901219005	PRIVABRATA PARIDA	Privyabrata Parid	Privyabrata Parid	Privyabrata Parid	Privyabrata Parid	
6	1901219006	RAJENDRA KUMAR BAL	ABC	Rajendra Bal	Rajendra Bal	Rajendra Bal	
7	1901219007	SHREE SONU NAIK	Shree sonu Naik	Shree sonu Naik	Shree sonu Naik	Shree sonu Naik	
8	1901219008	SUBHAGYA MAHAPATRA	Soubhagya Mahapat	ABC	Soubhagya Mahapat	Soubhagya Mahapat	
9	1901219009	SANJEET RAUTARAY	Sanjeet Rautaray	Sanjeet Rautaray	Sanjeet Rautaray	Sanjeet Rautaray	
10	1901219156	ABHIMILAN MUTHAMAJHI	A. Muthama Shi	A. Muthama Shi	A. Muthama Shi	A. Muthama Shi	
11	1901219157	ANISH SUBHADARSHI	A. Subhadarshi	A. Subhadarshi	A. Subhadarshi	A. Subhadarshi	
12	1901219158	DEEP SHANKAR	Deep Shankar	Deep Shankar	Deep Shankar	Deep Shankar	
13	1901219159	DINESH KUMAR MOHANTY	Dinesh Kumar Mohanty	Dinesh Kumar Mohanty	Dinesh Kumar Mohanty	Dinesh Kumar Mohanty	
14	1901219160	ISWAR CHANDRA GHADAI	Iswar Ch. Ghadei	Iswar Ch. Ghadei	Iswar Ch. Ghadei	Iswar Ch. Ghadei	
15	1901219161	MANOJ KUMAR KISHAN	ABC	Manoj Kumar Kishan	Manoj Kumar Kishan	Manoj Kumar Kishan	
16	1901219162	ROHIT KUMAR RAWANI	Rohit Rawani	Rohit Rawani	Rohit Rawani	Rohit Rawani	
17	1901219163	SATIYA NARAYAN BISOYI	Satyam Narayan Bisoi	Satyam Narayan Bisoi	Satyam Narayan Bisoi	Satyam Narayan Bisoi	
18	1901219164	SHYAM SUNDAR SOREN	Shyam Sagar Soren	Shyam Sagar Soren	Shyam Sagar Soren	Shyam Sagar Soren	
19	1901219165	SUBHAGYA RANJAN	Soubhagya R. Setty	Soubhagya R. Setty	Soubhagya R. Setty	Soubhagya R. Setty	
20	1901219166	SUNIL DAS	Sunil Das	Sunil Das	Sunil Das	Sunil Das	



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Programme: B Tech in AUTOMOBILE ENGINEERING		Semester: 5 th		Academic Year : 2021-22		Sheet No:	
Name of the Course: Electric and Hybrid vehicles		Course Code (if any):					
Sl No.	Reg. No.	Name of the Students	Date	Date	Date	Date	Date
1	1901219001	ABHISEK SAHOO	16/12/21	17/12/21	20/12/21	21/12/21	21/12/21
2	1901219002	ANURAG DAS	Abhisek Sahoo	Abhisek Sahoo	Anurag Das	Anurag Das	ABS
3	1901219003	DEBASHISH MALLICK	Debashish Mallik	Debashish Mallik	Debashish Mallik	Debashish Mallik	Debashish Mallik
4	1901219004	PABITRA KUMAR JENA	Pabitra Km. Jena	Pabitra Km. Jena	Pabitra Km. Jena	Pabitra Km. Jena	Pabitra Km. Jena
5	1901219005	PRIVABRATA PARIDA	Priyabrata Parida	Priyabrata Parida	Priyabrata Parida	Priyabrata Parida	Priyabrata Parida
6	1901219006	RAJENDRA KUMAR BAL	Rajendra Bal	Rajendra Bal	Rajendra Bal	Rajendra Bal	Rajendra Bal
7	1901219007	SHREE SONU NAIK	Shree Sonu Naik	Shree Sonu Naik	Shree Sonu Naik	Shree Sonu Naik	Shree Sonu Naik
8	1901219008	SOUBHAGYA MAHAPATRA	Soubhagya Mahapatra	Soubhagya Mahapatra	Soubhagya Mahapatra	Soubhagya Mahapatra	Soubhagya Mahapatra
9	1901219009	SANJEET RAUTARAY	Sanjeet Rautaray	Sanjeet Rautaray	Sanjeet Rautaray	Sanjeet Rautaray	Sanjeet Rautaray
10	1901219156	ABHIMILAN MUTHAMAJHI	A. Muthamajhi	A. Muthamajhi	A. Muthamajhi	A. Muthamajhi	A. Muthamajhi
11	1901219157	ANISH SUBHADARSHI	A. Subhadarshi	A. Subhadarshi	A. Subhadarshi	A. Subhadarshi	A. Subhadarshi
12	1901219158	DEEP SHANKAR	Deep Shankar	Deep Shankar	Deep Shankar	Deep Shankar	Deep Shankar
13	1901219159	DINESH KUMAR MOHANTY	Dinesh Kumar Mohanty	Dinesh Kumar Mohanty	Dinesh Kumar Mohanty	Dinesh Kumar Mohanty	Dinesh Kumar Mohanty
14	1901219160	ISWAR CHANDRA GHADAI	Iswar Ch. Ghadei	Iswar Ch. Ghadei	Iswar Ch. Ghadei	Iswar Ch. Ghadei	Iswar Ch. Ghadei
15	1901219161	MANOJ KUMAR KISHAN	Manoj Kumar Kishan	Manoj Kumar Kishan	Manoj Kumar Kishan	Manoj Kumar Kishan	Manoj Kumar Kishan
16	1901219162	ROHIT KUMAR RAWANI	Rohit Rawani	Rohit Rawani	Rohit Rawani	Rohit Rawani	Rohit Rawani
17	1901219163	SATYA NARAYAN BISOYI	Satya Narayan Bisoyi	Satya Narayan Bisoyi	Satya Narayan Bisoyi	Satya Narayan Bisoyi	Satya Narayan Bisoyi
18	1901219164	SHYAM SUNDAR SOREN	Shyam Sunda Soren	Shyam Sunda Soren	Shyam Sunda Soren	Shyam Sunda Soren	Shyam Sunda Soren
19	1901219165	SOUBHAGYA RANJAN	Soubhagya Ranjan	Soubhagya Ranjan	Soubhagya Ranjan	Soubhagya Ranjan	Soubhagya Ranjan
20	1901219166	SUNIL DAS	Sunil Das	Sunil Das	Sunil Das	Sunil Das	Sunil Das



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Programme: B Tech in AUTOMOBILE ENGINEERING		Semester: 5 th		Academic Year : 2021-22		Sheet No:	
Name of the Course: Electric and Hybrid vehicles				Course Code (if any):			
Sl No.	Reg. No.	Name of the Students	Date	Date	Date	Date	Date
1	1901219001	ABHISEK SAHOO	22/12/21	22/12/21	22/12/21	22/12/21	6/01/22
2	1901219002	ANURAG DAS	ABHISEK SAHOO	ANURAG DAS	ABHISEK SAHOO	ANURAG DAS	ABHISEK SAHOO
3	1901219003	DEBASHISH MALLICK	DEBASHISH MALLICK	DEBASHISH MALLICK	DEBASHISH MALLICK	DEBASHISH MALLICK	DEBASHISH MALLICK
4	1901219004	PABITRA KUMAR JENA	PABITRA KUMAR JENA	PABITRA KUMAR JENA	PABITRA KUMAR JENA	PABITRA KUMAR JENA	PABITRA KUMAR JENA
5	1901219005	PRIYABRATA PARIDA	PRIYABRATA PARIDA	PRIYABRATA PARIDA	PRIYABRATA PARIDA	PRIYABRATA PARIDA	PRIYABRATA PARIDA
6	1901219006	RAJENDRA KUMAR BAL	RAJENDRA KUMAR BAL	RAJENDRA KUMAR BAL	RAJENDRA KUMAR BAL	RAJENDRA KUMAR BAL	RAJENDRA KUMAR BAL
7	1901219007	SHREE SONU NAIK	SHREE SONU NAIK	SHREE SONU NAIK	SHREE SONU NAIK	SHREE SONU NAIK	SHREE SONU NAIK
8	1901219008	SOUBHAGYA MAHAPATRA	SOUBHAGYA MAHAPATRA	SOUBHAGYA MAHAPATRA	SOUBHAGYA MAHAPATRA	SOUBHAGYA MAHAPATRA	SOUBHAGYA MAHAPATRA
9	1901219009	SANJEET RAUTARAY	SANJEET RAUTARAY	SANJEET RAUTARAY	SANJEET RAUTARAY	SANJEET RAUTARAY	SANJEET RAUTARAY
10	1901219156	ABHIMILAN MUTHAMAJHI	A. MUTHAMAJHI	A. MUTHAMAJHI	A. MUTHAMAJHI	A. MUTHAMAJHI	A. MUTHAMAJHI
11	1901219157	ANISH SUBHADARSHI	A. SUBHADARSHI	A. SUBHADARSHI	A. SUBHADARSHI	A. SUBHADARSHI	A. SUBHADARSHI
12	1901219158	DEEP SHANKAR	DEEP SHANKAR	DEEP SHANKAR	DEEP SHANKAR	DEEP SHANKAR	DEEP SHANKAR
13	1901219159	DINESH KUMAR MOHANTY	DINESH KUMAR MOHANTY	DINESH KUMAR MOHANTY	DINESH KUMAR MOHANTY	DINESH KUMAR MOHANTY	DINESH KUMAR MOHANTY
14	1901219160	ISWAR CHANDRA GHADAI	ISWAR CH. GHADAI	ISWAR CH. GHADAI	ISWAR CH. GHADAI	ISWAR CH. GHADAI	ISWAR CH. GHADAI
15	1901219161	MANOJ KUMAR KISHAN	MANOJ KUMAR KISHAN	MANOJ KUMAR KISHAN	MANOJ KUMAR KISHAN	MANOJ KUMAR KISHAN	MANOJ KUMAR KISHAN
16	1901219162	ROHIT KUMAR RAWANI	ROHIT KUMAR RAWANI	ROHIT KUMAR RAWANI	ROHIT KUMAR RAWANI	ROHIT KUMAR RAWANI	ROHIT KUMAR RAWANI
17	1901219163	SATYA NARAYAN BISOYI	SATYA NARAYAN BISOYI	SATYA NARAYAN BISOYI	SATYA NARAYAN BISOYI	SATYA NARAYAN BISOYI	SATYA NARAYAN BISOYI
18	1901219164	SHYAM SUNDAR SOREN	SHYAM SUNDAR SOREN	SHYAM SUNDAR SOREN	SHYAM SUNDAR SOREN	SHYAM SUNDAR SOREN	SHYAM SUNDAR SOREN
19	1901219165	SOUBHAGYA RANJAN	SOUBHAGYA R. BETTY	SOUBHAGYA R. BETTY	SOUBHAGYA R. BETTY	SOUBHAGYA R. BETTY	SOUBHAGYA R. BETTY
20	1901219166	SUNIL DAS	SUNIL DAS	SUNIL DAS	SUNIL DAS	SUNIL DAS	SUNIL DAS



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STUDENT ATTENDANCE SHEET

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Programme: B Tech in AUTOMOBILE ENGINEERING		Semester: 5 th		Academic Year : 2021-22		Course Code (if any):		Sheet No:	
Name of the Course: Electric and Hybrid vehicles		Date	Date	Date	Date	Date	Date	Date	Date
Sl No.	Reg. No.	Name of the Students	Date	Date	Date	Date	Date	Date	Date
1	1901219001	ABHISEK SAHOO	10/01/22	11/01/22	12/01/22	13/01/22	14/01/22	15/01/22	16/01/22
2	1901219002	ANURAG DAS	Abhisek Sahoo	Abhisek Sahoo	Anurag Das	Anurag Das	Anurag Das	Anurag Das	Anurag Das
3	1901219003	DEBASHISH MALLICK	Debashish Mallik	ABS	Debashish Mallik	Debashish Mallik	Debashish Mallik	Debashish Mallik	Debashish Mallik
4	1901219004	PABITRA KUMAR JENA	Pabitra K. Jena	Pabitra K. Jena	Pabitra K. Jena	Pabitra K. Jena	Pabitra K. Jena	Pabitra K. Jena	Pabitra K. Jena
5	1901219005	PRIYABRATA PARIDA	Priyabrata Parida	Priyabrata Parida	Priyabrata Parida	Priyabrata Parida	Priyabrata Parida	Priyabrata Parida	Priyabrata Parida
6	1901219006	RAJENDRA KUMAR BAL	Rajendra Bal	Rajendra Bal	Rajendra Bal	Rajendra Bal	Rajendra Bal	Rajendra Bal	Rajendra Bal
7	1901219007	SHREE SONU NAIK	Shree Sonu Naik	Shree Sonu Naik	Shree Sonu Naik	Shree Sonu Naik	Shree Sonu Naik	Shree Sonu Naik	Shree Sonu Naik
8	1901219008	SOUBHAGYA MAHAPATRA	ABS	Soubhagya Mahapatra	Soubhagya Mahapatra	Soubhagya Mahapatra	Soubhagya Mahapatra	Soubhagya Mahapatra	Soubhagya Mahapatra
9	1901219009	SANJEET RAUTARAY	Sanjeet Rautaray	Sanjeet Rautaray	Sanjeet Rautaray	Sanjeet Rautaray	Sanjeet Rautaray	Sanjeet Rautaray	Sanjeet Rautaray
10	1901219156	ABHIMILAN MUTHAMAJHI	A-Muthamajhi	A-Muthamajhi	A-Muthamajhi	A-Muthamajhi	A-Muthamajhi	A-Muthamajhi	A-Muthamajhi
11	1901219157	ANISH SUBHADARSHI	A-Subhadarshi	A-Subhadarshi	A-Subhadarshi	A-Subhadarshi	A-Subhadarshi	A-Subhadarshi	A-Subhadarshi
12	1901219158	DEEP SHANKAR	Deep Shankar	Deep Shankar	Deep Shankar	Deep Shankar	Deep Shankar	Deep Shankar	Deep Shankar
13	1901219159	DINESH KUMAR MOHANTY	Dinesh Kumar Mohanty	Dinesh Kumar Mohanty	Dinesh Kumar Mohanty	Dinesh Kumar Mohanty	Dinesh Kumar Mohanty	Dinesh Kumar Mohanty	Dinesh Kumar Mohanty
14	1901219160	ISWAR CHANDRA GHADAI	Iswar Ch. Ghadei	Iswar Ch. Ghadei	Iswar Ch. Ghadei	Iswar Ch. Ghadei	Iswar Ch. Ghadei	Iswar Ch. Ghadei	Iswar Ch. Ghadei
15	1901219161	MANOJ KUMAR KISHAN	Manoj K. Kishan	Manoj K. Kishan	Manoj K. Kishan	Manoj K. Kishan	Manoj K. Kishan	Manoj K. Kishan	Manoj K. Kishan
16	1901219162	ROHIT KUMAR RAWANI	ABS	Rohit Rawani	Rohit Rawani	Rohit Rawani	Rohit Rawani	Rohit Rawani	Rohit Rawani
17	1901219163	SATYA NARAYAN BISOYI	Satyam Narayan Bisoyi	Satyam Narayan Bisoyi	Satyam Narayan Bisoyi	Satyam Narayan Bisoyi	Satyam Narayan Bisoyi	Satyam Narayan Bisoyi	Satyam Narayan Bisoyi
18	1901219164	SHYAM SUNDAR SOREN	Shyam S. Soren	Shyam S. Soren	Shyam S. Soren	Shyam S. Soren	Shyam S. Soren	Shyam S. Soren	Shyam S. Soren
19	1901219165	SOUBHAGYA RANJAN	Soubhagya R. Sethy	Soubhagya R. Sethy	Soubhagya R. Sethy	Soubhagya R. Sethy	Soubhagya R. Sethy	Soubhagya R. Sethy	Soubhagya R. Sethy
20	1901219166	SUNIL DAS	Sunil Das	Sunil Das	Sunil Das	Sunil Das	Sunil Das	Sunil Das	Sunil Das



(Signature)

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Certificate of Completion

This is to certify that Mr./Ms. DEEP SHANKAR BHARADWAJ, student of the Department

of Automobile Engg. semester Fifth bearing registration number 1901219158

has successfully completed the ADD-ON Course titled Electric and Hybrid vehicles

conducted at College of Engineering Bhubaneswar in the academic year 2021-22

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J. Mahapatra

Course-Coordinator

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Principal

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Certificate of Completion

This is to certify that Mr./Ms. ISWAR CHANDRA GHADGI, student of the Department
of Automobile Engg. semester Fifth bearing registration number 1901219160
has successfully completed the ADD-ON Course titled Electric and Hybrid vehicles
conducted at College of Engineering Bhubaneswar in the academic year 2021-22.

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J. Mahapatra
Course-Coordinator

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This is to certify that Mr./Ms. MANOJ KUMAR KISHAN, student of the Department

of Automobile Engg. semester Fifth bearing registration number 1901219161

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This is to certify that Mr./Ms. ROHIT KUMAR RAWANI, student of the Department


of Automobile Engg. semester Fifth bearing registration number 1901219162

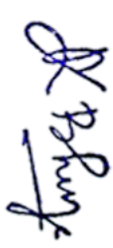
has successfully completed the ADD-ON Course titled Electric and Hybrid vehicles

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This is to certify that Mr./Ms. SATIYA NARAYAN BISOYI, student of the Department

of Automobile Engg. semester Fifth bearing registration number 1901219163

has successfully completed the ADD-ON Course titled Electric and Hybrid vehicles

conducted at College of Engineering Bhubaneswar in the academic year 2021-22.

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