



# RAAK

## COLLEGE OF ENGINEERING AND TECHNOLOGY

[Approved by AICTE, New Delhi & Affiliated to Pondicherry University]  
An ISO 9001:2015 Certified Institution

02.08.2021

From

Dr.R.Selvan  
Professor, Mechanical Engineering  
RAAK College of Engineering and Technology  
Puducherry -110

To

The Principal  
RAAK College of Engineering and Technology  
Puducherry -110

Respected Sir,

Sub: Requisition for Approval to Conduct Skill Development program / Value added Course on  
“21ME01- Optimization in Engineering Design” - reg.

This is to bring to your kind notice that the Skill Development Team is planning to conduct a Program on “21ME01- Optimization in Engineering Design” for all the Final Year Mechanical Engineering students from 09-08-2021 to 13-08-2021.

The syllabus and course plan structured are not listed in the Pondicherry University Curriculum and the same have been verified and approved by the Principal/HoD/Professors and Skill development team.

Hence, I kindly request you to approve event planned. The details and the necessary proofs are attached with this letter.

Thanking you,

Yours faithfully,

Dr.R.Selvan

Prof./MECH



Dr. S. SEENUVASAMURTHI, M.E., Ph.D.  
PRINCIPAL  
RAAK College of Engineering & Technology  
No.1, Muthupillai Palayam Road,  
Sulthanpet Post,  
Puducherry - 605 110



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RAAKCET/PRINCIPAL/CIR/AUG2021

03/08/2021

### CIRCULAR

This is to inform that the Skill Development Team is planning to conduct a value added course on “21ME01- Optimization in Engineering Design” for Final Year Mechanical Engineering students from 09-08-2021 to 13-08-2021. Students are asked to utilize this opportunity and improve their skills.

Circulation to:

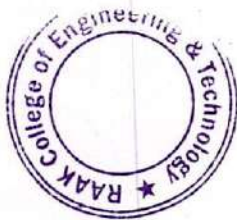
1. All Students
2. All Faculty & Staff Members
3. All HoDs

Copy to:

1. All HoDs
2. Office

PRINCIPAL

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.  
PRINCIPAL  
RAAK College of Engineering & Technology  
No.1, Muthupillai Palayam Road,  
Sulthanpet Post,  
Puducherry - 605 110





# RAAK

COLLEGE OF ENGINEERING & TECHNOLOGY  
(Approved by AKTE, New Delhi & Affiliated to Anna University, Chennai)  
An ISO 9001:2015 Certified Institution

**DEPARTMENT OF MECHANICAL ENGINEERING  
PRESENTS  
VALUE ADDED COURSE ON  
OPTIMIZATION IN ENGINEERING DESIGN (ONLINE MODE)**

**2021-2022**

DATE: 09/08/2021 to 13/08/2021

VENUE: RAAK CET

TIME: 09 am to 04 pm

**Resource Person:**

**Mr. S. Ravinderan**

*Assistant Professor,*

*Sri Venkateshwara College of Engg & Tech.*

**For Registration Contact:**

**Mr. R. Gokulakrishnan. AP/ MECH,**  
**8148367750.**

**H O D**

**Mr. R. Selvan**



**PRINCIPAL**

**Dr. S. Seenuvasamurthi**

**Dr. S. SEENUVASAMURTHI, M.E., Ph.D.**  
**PRINCIPAL**

**RAAK College of Engineering & Technology**

**No.1, Mahalingapuram Palayam Road,**

**Paducherry - 605 110**  
**WWW.RAAKENG.COM**



**rakeng@mail.com**



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### VALUE ADDED COURSES

2021-2022

Department of Mechanical Engineering

21ME01- Optimization in Engineering Design

Syllabus

**Duration: 30 hours**

#### Course Objective:

- Model and formulate optimization problems in standard form and assess the optimality of a solution
- Write computer code to determine the optimal solution for unconstrained and constrained nonlinear optimization problems of multiple variables
- Determine the advantages and disadvantages of applying different optimization techniques for a specific problem
- Model and analyze multi objective and multi disciplinary optimization problem

#### Course Outcome:

Upon successful completion of the course students able to

- This course introduces traditional and heuristic nonlinear optimization methods that can be used to solve a wide variety of engineering design problems across all engineering disciplines.
- students will study the tradeoffs associated with the design of complex engineering systems

#### Module 1:

**(6 Hours)**

Introduction to Optimization: Engineering application of Optimization – Statement of an Optimization problem – Optimal Problem formulation – Classification of Optimization problem. Optimum design concepts: Definition of Global and Local optima – Optimality criteria – Review of basic calculus concepts – Global optimality

#### Module 2:

**(6 Hours)**

Linear programming methods for optimum design: Review of Linear programming methods for optimum design – Post optimality analysis – Application of LPP models in design and manufacturing.

#### Module 3:

**(6 Hours)**

Optimization algorithms for solving unconstrained optimization problems – Gradient based method: Cauchy's steepest descent method, Newton's method, Conjugate gradient method.



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PRINCIPAL

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**Module 4:**

**(6 Hours)**

Optimization algorithms for solving constrained optimization problems – direct methods – penalty function methods – steepest descent method – Engineering applications of constrained and unconstrained algorithms.

**Module 5**

**(6 Hours)**

Modern methods of Optimization: Genetic Algorithms – Simulated Annealing – Ant colony optimization – Tabu search – Neural-Network based Optimization – Fuzzy optimization techniques .

Course Designed by

Approved by

Principal



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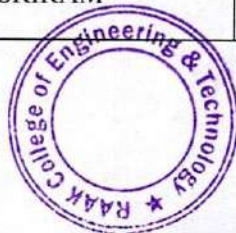
# RAAK

## COLLEGE OF ENGINEERING AND TECHNOLOGY

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### CO - ATTAINMENT MAPPING

Sl. No	Register Number	Student Name	CO1	CO2	CO3	CO4
1	18TB1201	AJAY.D	✓	✓	✓	✓
2	18TB1202	AMEENUL ISLAM.N	✓	✓	✓	✓
3	18TB1204	DHAYANITHI.A	✓	✓	✓	✓
4	18TB1206	EZHILARASAN.S	✓	✓	✓	✓
5	18TB1207	GANESH.M	✓	✓	✓	✓
6	18TB1208	GNANASEKAR.S	✓	✓	✓	✓
7	18TB1209	KARTHIKEYAN.S	✓	✓	✓	✓
8	18TB1210	KIRAN.K	✓	✓	✓	✓
9	18TB1211	KOWS.R	✓	✓	✓	✓
10	18TB1212	MOHAMED IRSHATH.R	✓	✓	✓	✓
11	18TB1213	SARANVEL.M	✓	✓	✓	✓
12	18TB1214	SELVAGANAPATHY.T	✓	✓	✓	✓
13	18TB1215	SIVA.A	✓	✓	✓	✓
14	18TB1216	SIVARAJ.K	✓	✓	✓	✓
15	18TB1217	SIVASANKARAN.K	✓	✓	✓	✓
16	18TB1218	VUBALANKA SAI VENKATA SRIRAM	✓	✓	✓	✓



*[Signature]*  
**Dr. S. SEENUVASAMURTHI, M.E., Ph.C.,**  
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17	18TBL087	GOKULAKRISHNAN.S	✓	✓	✓	✓
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### VALUE ADDED COURSES 2021-2022

Department of Mechanical Engineering  
21ME01- Optimization in Engineering Design

#### COURSE PLAN

S.no	Date	Hours	Time	Topic	Faculty details
DAY -1					
1	09.08.21	1,2	9AM -11AM	Introduction to Optimization: Engineering application of Optimization – Statement of an Optimization problem – Optimal Problem formulation	Mr.S.Ravienderan & Mr.K.Ainnar
2		3,4	11.15AM – 1.15 PM	Classification of Optimization problem. Optimum design concepts: Definition of Global and Local optima	Mr.K.Ainnar
3		5,6	2 PM -4PM	Optimality criteria – Review of basic calculus concepts – Global optimality	Mr.S.Ravienderan
DAY 2					
4	10.08.21	7,8	9AM -11AM	Linear programming methods for optimum design:	Mr.K.Ainnar
5		9,10,	11.15AM – 1.15 PM	Review of Linear programming methods for optimum design – Post optimality analysis	Mr.S.Ravienderan
6		11,12	2 PM -4PM	Application of LPP models in design and manufacturing.	Mr.K.Ainnar
DAY -3					
7	11.08.21	13,14	9AM -11AM	Optimization algorithms for solving unconstrained optimization problems	Mr.S.Ravienderan



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8		15,16	11.15AM – 1.15 PM	– Gradient based method: Cauchy's steepest descent method	Mr.K.Ainnar
9		17,18	2 PM -4PM	Newton's method, Conjugate gradient method.	Mr.S.Ravienderan
DAY -4					
10		19,20	9AM -11AM	Optimization algorithms for solving constrained optimization problems – direct methods	Mr.K.Ainnar
11	12.08.21	21,22	11.15AM – 1.15 PM	penalty function methods – steepest descent method	Mr.S.Ravienderan
12		23,24	2 PM -4PM	Engineering applications of constrained and unconstrained algorithms.	Mr.K.Ainnar
DAY -5					
13		25,26	9AM -11AM	Modern methods of Optimization: Genetic Algorithms – Simulated Annealing – Ant colony optimization	Mr.S.Ravienderan
14	13.08.21	27,28	11.15AM – 1.15 PM	Simulated Annealing – Ant colony optimization,	Mr.K.Ainnar
15		29,30	2 PM -4PM	Modern methods of Optimization: Genetic Algorithms – Simulated Annealing – Ant colony optimization	Mr.S.Ravienderan
***ASSESSMENT EXAM WILL BE CONDUCTED AFTER ONE WEEK OF COURSE COMPLETION ****					

BREAK TIME: 11.00 TO 11.15 AM

LUNCH BREAK: 1.15 PM TO 2.00 PM

COURSE DESIGNED BY

DR. P. SELVAN



APPROVED BY

SKILL DEVELOPMENT TEAM

PRINCIPAL

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VALUE ADDED COURSES  
2021-2022

Department of Mechanical Engineering

### EVENT REPORT

Name of the Course: 21ME01- Optimization in Engineering Design (Online mode)

Name of the Instructors: Mr.S.Ravienderan & Mr.K.Ainnar

Year/ Branch: 1V/ Mechanical

Duration of Course: 30 Hours (09-08-2021 to 13-08-2021)

Assessment Date: 20.08.2021

#### Post Event Summary:

The course was inaugurated on 09-08-2021 at 9.30 A.M. by our respectable principal and sessions were continued as per the schedule. Students were enriched their knowledge by attending the course. Finally, the course concluded by vote of thanks.

On 20.08.2021 assessment was conducted and feedbacks were collected from all the participants.

#### CO - Attainment:

**CO1:** Model and formulate optimization problems in standard form and assess the optimality of a solution

**CO2:** Write computer code to determine the optimal solution for unconstrained and constrained nonlinear optimization problems of multiple variables

**CO3:** Determine the advantages and disadvantages of applying different optimization techniques for a specific problem

**CO4:** Model and analyze multi objective and multi disciplinary optimization problem



  
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Value Added Course on Optimization in Engineering Design 2021-22.



Review of Linear programming methods for optimum design on 10.08.21



  
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02/08/2021

From

R.Selvan  
Professor, Mechanical Engineering  
RAAK College of Engineering and Technology  
Puducherry -110

To

The Principal  
RAAK College of Engineering and Technology  
Puducherry -110

Respected Sir,

Sub: Requisition for Approval to Conduct Skill Development program / Value added Course on “**21ME02- Energy Storage Technology**” - reg.

This is to bring to your kind notice that the Skill Development Team is planning to conduct a Program on “**21ME02- Energy Storage Technology**” for the Third Year Mechanical Engineering students from 09-08-2021 to 13-08-2021.

The syllabus and course plan structured are not listed in the Pondicherry University Curriculum and the same have been verified and approved by the Principal/HoD/Professors and Skill development team.

Hence, I kindly request you to approve event planned. The details and the necessary proofs are attached with this letter.


Thanking you,

Yours faithfully

Dr.R.Selvan

Professor/MECH



  
Dr. S. SEENUVASAMURTHI, M.E., Ph.D.  
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RAAKCET/PRINCIPAL/CIR/AUG2021

03/08/2021

### CIRCULAR

This is to inform that the Skill Development Team is planning to conduct a value added course on “21ME02-Energy Storage Technology” for Third Year Mechanical Engineering students from 09-08-2021 to 13-08-2021. Students are asked to utilize this opportunity and improve their skills.

Circulation to:


1. All Students
2. All Faculty & Staff Members
3. All HoDs

Copy to:

1. All HoDs



  
PRINCIPAL

  
Dr. S. SEENUVASAMURTHI, M.E., Ph.D.  
PRINCIPAL  
RAAK College of Engineering & Technology  
No.1, Muthupillai Palayam Road,  
Sulthanpet Post,  
Puducherry - 605 110



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**DEPARTMENT OF MECHANICAL ENGINEERING  
PRESENTS  
VALUE ADDED COURSE ON  
ENERGY STORAGE TECHNOLOGY ( ONLINE MODE)**

**2021-2022**

DATE: 09/08/2021 to 13/08/2021

VENUE: RAAK CET

TIME: 09 am to 04 pm

**Resource Person:**

**Mr. G. Palanivel**

**Assistant Professor,**

**Sri Venkateshwara College of Engg & Tech.**

**For Registration Contact:**

**Mr. R. Gokulakrishnan. AP/ MECH,  
8148367750.**

**HOD**

**Mr. R. Selvan**



**PRINCIPAL**

**Dr. S. Seenuvasamurthi**

**Dr. S. SEENUVASAMURTHI, M.E., Ph.D.**

**PRINCIPAL**

**RAAK College of Engineering & Technology**

**No. 1, Muthupilla Palayam Road,**

**Siluvampatti Post,  
Puducherry - 605 004**

**WWW.raakengg.com**



**raakengg@mail.com**



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### VALUE ADDED COURSES

2021-2022

Department of Mechanical Engineering

21ME02- Energy Storage Technology

Syllabus

**Duration: 30 hours**

#### Course Objective:

- Identify the requirement, current status and future prospectus of energy storage.
- Storage duration, energy efficiency, energy density, cycle life and life time etc.
- Analyze technical characteristics of various electrochemical energy storage systems.
- Compare various mechanical energy storage systems on the basis of power rating and discharge time

#### Course Outcome:

Upon successful completion of the course students able to

- To understand the fundamental theory of energy storage technologies
- To make the students understand the key energy storage technologies work, and novel developments in energy storage technology research.
- Understand how storage technologies solve real-world problems at domestic, city and grid scales"

#### Module 1:

**(6 Hours)**

Introduction to energy storage for power systems: Role of energy storage systems, applications.

#### Module 2:

**(6 Hours)**

Overview of energy storage technologies: Thermal, Mechanical, Chemical, Electrochemical, Electrical. Efficiency of energy storage systems.

#### Module 3:

**(6 Hours)**

Batteries, Super capacitors, Superconducting Magnetic Energy Storage (SMES), charging methodologies, SoC, SoH estimation techniques. Hydrogen production and storage, fuel cells.



  
Dr. S. SEENUVASAMURTHI, M.E., Ph.D.  
PRINCIPAL  
RAAK College of Engineering & Technology  
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Sulthanpet Post,  
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### Module 4:

(6 Hours)

Mobile storage system: electric vehicle, G2V, V2G. Hybrid Energy storage systems: configurations and applications.

### Module 5

(6 Hours)

Energy storage in Micro-grid and Smart grid. Energy Management with storage systems, Increase of energy conversion efficiencies by introducing energy storage .

A handwritten signature in black ink.

Course Designed by

A handwritten signature in black ink.

Approved by

A handwritten signature in black ink.

Principal

A handwritten signature in blue ink.

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.  
PRINCIPAL  
RAAK College of Engineering & Technology  
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### CO - ATTAINMENT MAPPING

Sl. No	Register Number	Student Name	CO1	CO2	CO3	CO4
1	19TB1201	ABDUL AJEES.M	✓	✓	✓	✓
2	19TB1202	ARUNESHWAR. J	✓	✓	✓	✓
3	19TB1203	DEVA. R	✓	✓	✓	✓
4	19TB1205	MOHANDOSS. A	✓	✓	✓	✓
5	19TB1206	NANTHAKUMAR. S	✓	✓	✓	✓
6	19TB1207	NARAYANA MOORTHILS	✓	✓	✓	✓
7	19TB1208	PONNAMBALAM. E	✓	✓	✓	✓
8	19TB1209	PRADEEPRAJ.R	✓	✓	✓	✓
9	19TB1211	SILAMBU KALIDASAN. M	✓	✓	✓	✓
10	19TB1212	VASANTHARAJ. R	✓	✓	✓	✓
11	19TBL055	GOUTHAM.N	✓	✓	✓	✓



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### VALUE ADDED COURSES

2021-2022

Department of Mechanical Engineering

21ME02- Energy Storage Technology

### COURSE PLAN

S.no	Date	Hours	Time	Topic	Faculty details
DAY -1					
1	09.08.21	1,2	9AM -11AM	Introduction to energy storage for power systems	Mr. S.Anbusezhian & Mr.G.Palanivel
2		3,4	11.15AM – 1.15 PM	Role of energy storage systems	Mr. S.Anbusezhian
3		5,6	2 PM -4PM	Role of energy storage, applications	Mr.G.Palanivel
DAY 2					
4	10.08.21	7,8	9AM -11AM	Overview of energy storage technologies: Thermal, Mechanical,:	Mr. S.Anbusezhian
5		9,10,	11.15AM – 1.15 PM	Chemical, Electrochemical	Mr.G.Palanivel
6		11,12	2 PM -4PM	Electrical. Efficiency of energy storage systems.	Mr. S.Anbusezhian
DAY -3					
7	11.08.21	13,14	9AM -11AM	Batteries, Super capacitors, Superconducting Magnetic Energy Storage (SMES)	Mr.G.Palanivel
8		15,16	11.15AM – 1.15 PM	charging methodologies, SoC, SoH estimation techniques	Mr. S.Anbusezhian
9		17,18	2 PM -4PM	Hydrogen production and storage, fuel cells.	Mr.G.Palanivel
DAY -4					
10	12.08.21	19,20	9AM -11AM	Mobile storage system: electric vehicle, G2V, V2G.	Mr. S.Anbusezhian
11		21,22	11.15AM – 1.15 PM	. Hybrid Energy storage systems	Mr.G.Palanivel



**Dr. S. SEENUVASAMURTHI, M.E., Ph.C.**  
PRINCIPAL  
RAAK College of Engineering & Technology  
No.1, Muthupillai Palayam Road,  
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12		23,24	2 PM -4PM	configurations and applications.	Mr. S.Anbusezhian
DAY -5					
13	13.08.21	25,26	9AM -11AM	Energy storage in Micro-grid and Smart grid	Mr.G.Palanivel
14		27,28	11.15AM – 1.15 PM	Management with storage systems,	Mr. S.Anbusezhian
15		29,30	2 PM -4PM	Increase of energy conversion efficiencies by introducing energy storage.	Mr.G.Palanivel
***ASSESSMENT EXAM WILL BE CONDUCTED AFTER ONE WEEK OF COURSE COMPLETION ****					

BREAK TIME: 11.00 TO 11.15 AM

LUNCH BREAK: 1.15 PM TO 2.00 PM

COURSE DESIGNED BY  
Dr.R.Selvan

APPROVED BY  
SKILL DEVELOPMENT TEAM

PRINCIPAL  
Dr.S.SEENUVASAMURTHI



Dr. S. SEENUVASAMURTHI, M.E., Ph.D.  
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**VALUE ADDED COURSES  
2021-2022  
Department of Mechanical Engineering  
EVENT REPORT**

Name of the Course: 21ME02- Energy Storage Technology (Online mode)

Name of the Instructors: Mr. S.Anbusezhian & Mr.G.Palanivel

Year/ Branch: III/ Mechanical

Duration of Course: 30 Hours (09-08-2021 to 13-08-2021)

Assessment Date: 20.08.2021

**Post Event Summary:**

The course was inaugurated on 09-08-2021 at 9.30 A.M. by our respectable principal and sessions were continued as per the schedule. Students were enriched their knowledge by attending the course. Finally, the course concluded by vote of thanks.

On 20.08.2021 assessment was conducted and feedbacks were collected from all the participants.

**CO - Attainment:**

**CO1:** Identify the requirement, current status and future prospectus of energy storage.

**CO2:** storage duration, energy efficiency, energy density, cycle life and life time etc.

**CO3:** Analyze technical characteristics of various electrochemical energy storage systems.

**CO4:** Compare various mechanical energy storage systems on the basis of power rating and discharge time,



  
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**Value Added Course on Energy Storage Technology 2021-22**



Mobile storage system: electric vehicle, G2V, V2G.on 12.08.21



  
**Dr. S. SEENUVASAMURTHI, M.E., Ph.D.**  
**PRINCIPAL**

RAAK College of Engineering & Technology  
No.1, Muthupillai Palayam Road,  
Sulthanpet Post,  
Puducherry - 605 110.



# RAAK

## COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)  
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02/08/2021

From

Dr.R.Selvan  
Professor, Mechanical Engineering  
RAAK College of Engineering and Technology  
Puducherry -110

To

The Principal  
RAAK College of Engineering and Technology  
Puducherry -110

Respected Sir,

Sub: Requisition for Approval to Conduct Skill Development program / Value added Course on  
**"21ME03- Waste to Energy Conversion Techniques"** -reg.

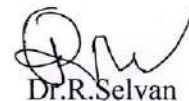
This is to bring to your kind notice that the Skill Development Team is planning to conduct a Program on **"21ME03- Waste to Energy Conversion Techniques"** for all the Second Year Mechanical Engineering students from 09-08-2021 to 13-08-2021.

The syllabus and course plan structured are not listed in the Pondicherry University Curriculum and the same have been verified and approved by the Principal/HoD/Professors and Skill development team.

Hence, I kindly request you to approve event planned. The details and the necessary proofs are attached with this letter.


Thanking you,

Yours faithfully,



Dr.R.Selvan

Professor/MECH



Dr. S. SEENUVASAMURTHI, M.E., Ph.D.  
PRINCIPAL  
RAAK College of Engineering & Technology  
No.1, Muthupillai Palayam Road,  
Sulthanpet Post,  
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RAAKCET/PRINCIPAL/CIR/AUG2021

03/08/2021

### CIRCULAR

This is to inform that the Skill Development Team is planning to conduct a value added course on "21ME03- Waste to Energy Conversion Techniques" for Second Year Mechanical Engineering students from 09-08-2021 to 13-08-2021. Students are asked to utilize this opportunity and improve their skills.



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Circulation to:

1. All Students
2. All Faculty & Staff Members
3. All HoDs

Copy to:

1. All HoDs
2. Office



Dr. S. SEENUVASAMURTHI, M.E., Ph.D.  
PRINCIPAL  
RAAK College of Engineering & Technology  
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**DEPARTMENT OF MECHANICAL ENGINEERING  
PRESENTS  
VALUE ADDED COURSE ON  
WASTE TO ENERGY CONVERSION TECHNIQUES ( ONLINE MODE)**

**2021-2022**

**DATE: 09/08/2021 to 13/08/2021**

**VENUE: RAAKCET**

**TIME: 09 am to 04 pm**

**Resource Person:**

**Mr. S. Anbusezhian  
Assistant Professor,  
Achariya College of Engg & Tech.**

**For Registration Contact:**

**Mr. R. Gokulakrishnan. AP/ MECH,  
8148367750.**

**HOD**

**Mr. R. Selvan**



**PRINCIPAL**

**Dr. S. Seenuvasamurthi**

**Dr. S. SEENUVASAMURTHI, M.E., Ph.D.**

**PRINCIPAL**

**RAAK College of Engineering & Technology**

**No.1, Madhavilai Palayam Road,**



**Post**

**WWW.raakengg.com**



**raakengg@mail.com**





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### VALUE ADDED COURSES

2021-2022

Department of Mechanical Engineering

21ME03- Waste to Energy Conversion Techniques

Syllabus

**Duration: 30 hours**

#### Course Objective:

- To understand the various waste generation sources and their management.
- To know the various waste to energy conversion technologies.
- To understand various impacts like health and environment issues and significance of different technologies.
- To get acquainted with commercial aspects of waste to energy.

#### Course Outcome:

Upon successful completion of the course students able to

- Student will be able to characterize different types of waste and understand the principles behind waste-to-energy conversion processes.
- Analyze the suitability of different waste-to-energy conversion methods for specific waste types.
- Design and implement waste-to-energy projects
- Apply practical experience in waste-to-energy conversion techniques

#### Module 1:

**(6 Hours)**


Wastes: Introduction and characterization of wastes, definition of waste, types of waste, characteristics of waste, waste disposal methods.

#### Module 2:

**(6 Hours)**

Energy Production from Wastes – I: Energy production through incineration, gasification, pyrolysis and syngas utilization. Incineration: principle, advantages, and disadvantages; Gasification: principle, advantages, and disadvantages; Pyrolysis: principle, advantages, and disadvantages; Syngas utilization: principle, advantages, and disadvantages.



  
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PRINCIPAL  
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### Module 3:

(6 Hours)

Energy Production from Wastes – II: Energy production through anaerobic digestion, fermentation, transesterification and introduction to microbial fuel cells. Anaerobic digestion: principle, advantages, and disadvantages; Fermentation: principle, advantages, and disadvantages; Transesterification: principle, advantages, and disadvantages; Introduction to microbial fuel cells: principle, advantages, and disadvantages.

### Module 4:

(6 Hours)

Energy Production from Algae: Cultivation of algal biomass from wastewater and energy production from algae. Algae cultivation: principle, advantages, and disadvantages; Energy production from algae: principle, advantages, and disadvantages; Applications of algae in waste management.

### Module 5

(6 Hours)

Energy Production from Solid Wastes: Densification of solids, efficiency improvement of power plant and energy production from waste plastics. Densification of solids: principle, advantages, and disadvantages; Efficiency improvement of power plants: principle, advantages, and disadvantages; Energy production from waste plastics: principle, advantages, and disadvantages; Applications of waste plastics in energy generation.

Courses Designed by

Approved by

Principal



Dr. S. SEENUVASAMURTHI, M.E., Ph.D.  
PRINCIPAL

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### CO - ATTAINMENT MAPPING

Sl. No	Register Number	Student Name	CO1	CO2	CO3	CO4
1	20TB0301	ABINESH.A	✓	✓	✓	✓
2	20TB0302	AMARESH.V	✓	✓	✓	✓
3	20TB0303	HARISUDHAN.D	✓	✓	✓	✓
4	20TB0304	KAPILDEV.S	✓	✓	✓	✓
5	20TB0305	RAJENDIRAN.P	✓	✓	✓	✓
6	20TB0306	SURESH KUMAR.R	✓	✓	✓	✓
7	20TBL175	HARIHARAN V	✓	✓	✓	✓
8	20TBL176	JEROSIN.D	✓	✓	✓	✓
9	20TBL177	KISHORE.K	✓	✓	✓	✓
10	20TBL178	MADHAVAN.G.K	✓	✓	✓	✓
11	20TBL180	PRAVIN.I	✓	✓	✓	✓
12	20TBL181	RAGHUL RAJ.K	✓	✓	✓	✓
13	20TBL182	RITHEESH KUMAR.R	✓	✓	✓	✓
14	20TBL183	THAMIZH ELAKIYAN.S	✓	✓	✓	✓



*Dr. S. SEENUVASAMURTHI, M.E., Ph.C.,*  
PRINCIPAL  
RAAK College of Engineering & Technology  
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### VALUE ADDED COURSES

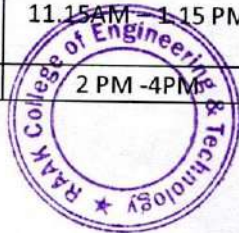
2021-2022

Department of Mechanical Engineering

21ME03- Waste to Energy Conversion Techniques

### COURSE PLAN

S.no	Date	Hours	Time	Topic	RESOURCE PERSON
DAY -1					
1	09.08.21	1.2	9AM -11AM	Wastes: Introduction and characterization of wastes	Mr.G.Palanivel & Mr. S.Anbusezhian
2		3,4	11.15AM – 1.15 PM	definition of waste, types of waste,	Mr.G.Palanivel
3		5.6	2 PM -4PM	Characteristics of waste, waste disposal methods.	Mr. S.Anbusezhian
DAY 2					
4	10.08.21	7,8	9AM -11AM	Energy Production from Wastes – I: Energy production through incineration, gasification, pyrolysis and syngas utilization.	Mr.G.Palanivel
5		9,10,	11.15AM – 1.15 PM	Incineration: principle, advantages, and disadvantages; Gasification: principle, advantages, and disadvantages	Mr. S.Anbusezhian
6		11,12	2 PM -4PM	Pyrolysis: principle, advantages, and disadvantages; Syngas utilization: principle, advantages, and disadvantages	Mr.G.Palanivel
DAY -3					
7	11.08.21	13,14	9AM -11AM	Energy production through anaerobic digestion, fermentation, transesterification and introduction to microbial fuel cells. Anaerobic digestion: ;	Mr. S.Anbusezhian
8		15,16	11.15AM – 1.15 PM	Fermentation: principle, advantages, and disadvantages	Mr.G.Palanivel
9		17,18	2 PM -4PM	Transesterification:	Mr. S.Anbusezhian



Dr. S. Rajan  
PRINCIPAL  
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				principle, advantages, and disadvantages; Introduction to microbial fuel cells: principle, advantages, and disadvantages	
DAY -4					
10	12.08.21	19,20	9AM -11AM	Energy Production from Algae: Cultivation of algal biomass from wastewater and energy production from algae	Mr. S.Anbusezhian
11		21,22	11.15AM – 1.15 PM	Algae cultivation: principle, advantages, and disadvantages	Mr.G.Palanivel
12		23,24	2 PM -4PM	Energy production from algae: principle, advantages, and disadvantages; Applications of algae in waste management.	Mr. S.Anbusezhian
DAY -5					
13	13.08.21	25,26	9AM -11AM	Energy Production from Solid Wastes: Densification of solids, efficiency improvement of power plant and energy production from waste plastics	Mr.G.Palanivel
14		27,28	11.15AM – 1.15 PM	Densification of solids: principle. Efficiency improvement of power plants: principle, advantages, and disadvantages;	Mr. S.Anbusezhian
15		29,30	2 PM -4PM	Energy production from waste plastics: principle, advantages, and disadvantages; Applications of waste plastics in energy generation	Mr.G.Palanivel

\*\*\*ASSESSMENT EXAM WILL BE CONDUCTED AFTER ONE WEEK OF COURSE COMPLETION \*\*\*

BREAK TIME: 11.00 TO 11.15 AM

LUNCH BREAK: 1.15 PM TO 2.00 PM



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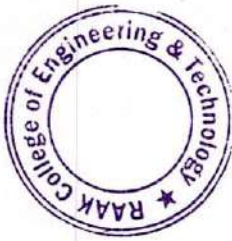
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COURSE DESIGNED BY  
Dr.R.Selvan

APPROVED BY  
SKILL DEVELOPMENT TEAM

PRINCIPAL  
Dr.S.SEENUVASAMURTHI



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### VALUE ADDED COURSES

2021-2022

Department of Mechanical Engineering

### EVENT REPORT

Name of the Course: 21ME03- Waste to Energy Conversion Techniques (Online mode)

Name of the Instructors: Mr.G.Palanivel & Mr. S.Anbusezhian

Year/ Branch: II/ Mechanical

Duration of Course: 30 Hours (09-08-2021 to 13-08-2021)

Assessment Date: 20.08.2021

#### Post Event Summary:

The course was inaugurated on 09-08-2021 at 9.30 A.M. by our respectable principal and sessions were continued as per the schedule. Students were enriched their knowledge by attending the course. Finally, the course concluded by vote of thanks.

On 20.08.2021 assessment was conducted and feedbacks were collected from all the participants.

#### CO - Attainment:

**CO1:** Student will be able to characterize different types of waste and understand the principles behind waste-to-energy conversion processes.

**CO2:** Analyze the suitability of different waste-to-energy conversion methods for specific waste types.

**CO3:** Design and implement waste-to-energy projects

**CO4:** Apply practical experience in waste-to-energy conversion techniques



  
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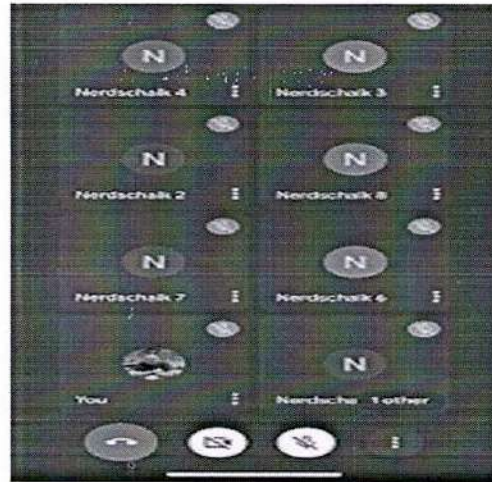
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### Value Added Course on Waste to Energy Conversion Techniques 2021-22



Algae cultivation: principle, advantages, and disadvantages on 12.08.21



  
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