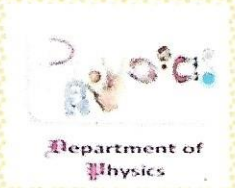


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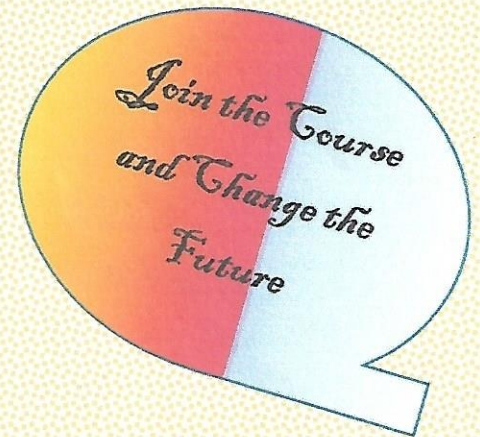
CERTIFICATE COURSES OFFERED IN DEPARTMENT OF PHYSICS



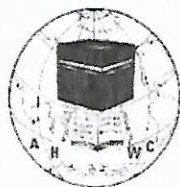
Medical Physics

Energy Resources

Residential Electric Devices



We have designed the courses for you to strengthen your interdisciplinary skills. You will be able to handle certain commonly used domestic appliances safely. You can understand the usage and applications of renewable sources to meet the increasing demand of the energy. The course covers range of medical imaging techniques like ECG, Mammogram and Ultrasound Imaging. It offers the knowledge about the application of LASER in ophthalmology and diagnosis.



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(A Unit of As-Sathiq Educational Society)

DEPARTMENT OF PHYSICS

Academic Year 2022-2023

Certificate course



Department of
Physics

About the Course

This course is devised such that it prepares the students to handle certain commonly used domestic appliances safely. It makes them gain knowledge about AC and DC motors, earthing and overloading of electrical circuits. They acquire familiarity in house wiring and colour codes for insulation wires.

Pedagogical Outline

The duration of the course is one year which incorporates theory classes, assignments, quizzes and internal tests.

Eligibility

Students of all programmes are eligible to enrol for this course.

Scope of the Course

This course offers carrier opportunities ranging from rectification of faults in the electrical circuits, easy handling of electrical devices.

Certificate Course in Residential Electric Devices		
Paper – I	Course Code: 2022RED12	
Hrs: 30	Duration : 1 year	Credits: 2

Course Objectives

Objective of this course is to provide a basic knowledge in electricity and the learners are expected to gain knowledge to design and trouble shoot electrical circuits.

Course Content

UNIT I

7L

Resistance – capacitance – Inductance - Ohm's Law - Electrical Energy – Power – Watt-KWh-Consumption of electrical power.

UNIT II

7L

Transformers – Principle & Working - Testing of Transformers - Cooling of Transformers - Losses in Transformers.

UNIT III

8L

Electric Bulbs - Fluorescent Lamps - Street Lighting - Electric Fans - Wet Grinder – Mixer - Water Heater - Electric Iron Box - Microwave Oven - Washing Machine Stabilizer - Fridge and Air Conditioner.

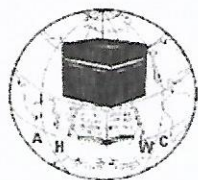
UNIT IV

8L

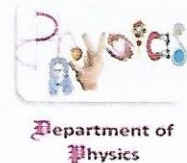
AC and DC - Single Phase and three phase connections - House Wiring — Earthing - Short Circuiting - Colour code for insulation wires - Power Inverter – Uninterrupted Power supply

Text Books

- 1.A textbook in electrical technology –B L Theraja S Chand & Co.
- 2.A textbook of electrical technology - A K Theraja
- 3.Performance and design of AC Machines – M G Say ELBS Edn.
- 4.Semiconductor physics and Opto electronics by P.K.Palanichamy.
- 5.Basic Electronics - B L Theraja –S. Chand & Co.
- 6.Principles of Communication Engineering-Arokh Singh and A.K Chhabra –S.Chand & Co.



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CERTIFICATE COURSE

Academic Year 2022-2023

Department of Physics

offers

Certificate Course in Residential Electrical Devices

Course Outcome

CO No.	<i>Expected Course Outcomes</i> <i>Upon completion of this course, the students will be able to:</i>	Cognitive Level
1	Understand the operations and safe handling of commonly used domestic appliances.	Un / Ap
2	Understand the basic ideas about the components used in electrical appliances.	Re / Un
3	Understand and apply knowledge to design and troubleshoot the electrical circuits.	Ap / Un
4	Understand the earthing and colour coding of the wires.	Re / Un

Cognitive Level: Re-Remember; Un-Understanding; Ap-Apply



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Department of
Physics

DEPARTMENT OF PHYSICS

Academic Year 2022-2023

Certificate course

About Course

This course is framed such that the students can understand the concept of electromagnetic spectrum and X-rays. It provides detailed description of both artificial and natural radioactivity and radioactive waste management. The course covers range of medical imaging techniques like ECG, Mammogram and Ultrasound Imaging. It offers the knowledge about the application of LASER in ophthalmology and diagnosis.

Pedagogical Outline

The duration of the course is one year which incorporates theory classes, assignments, quizzes and internal tests.

Eligibility

Students of all programmes are eligible to enrol for this course.

Scope of the Course

This course offers carrier opportunities ranging from clinical activities, quality assurance radio safety and cosmetic therapist.

Certificate Course in Medical Physics		
Paper – I	Course Code: 2022MPH11	
Hrs: 30	Duration: 1 year	Credits: 2

Course Objectives

The objective of the course is to provide a basic knowledge in biomedical instrumentation and awareness regarding radiation hazards and safety.

Course Content

Unit I : Introduction to Electromagnetic waves and X-ray

7L

Electromagnetic spectrum- Production of X-rays - X-ray tubes - X-ray generator circuits - Exposure time

Unit II: Radioactivity

8L

Artificial and natural radioactivity-Conventional sources of radiation-Effect of radiation on cells Measurement of biological damage - Radioactive waste management

Unit III: Bio medical Imaging

8L

Biomedical computer application-Computer analysis of ECG-Computerized Axial Tomography (CAT)- Magnetic Resonance Imaging - Ultra-sound imaging

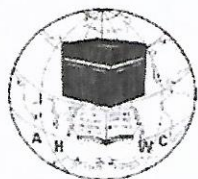
Unit IV: Lasers in medicine

7L

Principle and production- Application of lasers in therapy and diagnosis- Laser in ophthalmology- Lasers as a beautician's tool- Laser Hazards & biological effects

Text Books

- Basic Radiological Physics Dr.K.Thayalan – Jayapee Brothers Medical Publishing Pvt.Ltd.New Delhi(2003).
- The essential physics of Medical Imaging:Bushberg,Seibert,Leidholdt and Boone Lippincot Williams and Wilkins, Second edition(2002).
- Lasers in Medicine-R W Wayanant, Plenum publishing Co.
- Nuclear medicine physics: Chandra – Lippincot Williams and Wilkins(1998).



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CERTIFICATE COURSE

Academic Year 2022-2023



Department of
Physics

DEPARTMENT OF PHYSICS

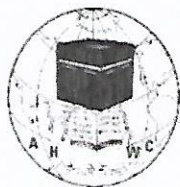
offers

Certificate Course in Medical Physics

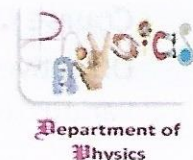
Course Outcome

CO No.	<i>Expected Course Outcomes</i> <i>Upon completion of this course, the students will be able to:</i>	Cognitive Level
1	Define electromagnetic spectrum and Sketch the X- ray tube design	U / Ap
2	Identify the sources of radio activity. Explain the units of radiation and measure the biological damage	Re / Un / Ev
3	Discuss about CAT scanners and understand the computer analysis of ECG	Ev / Un
4	Understand Ultrasound imaging & generalize the uses of lasers. Interpret the effect of laser radiation on tissues	Re / An/ Un

Cognitive Level: Re-Remember; Un-Understanding; Ap-Apply; An-Analyze; Ev-Evaluate



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DEPARTMENT OF PHYSICS

Certificate course

About the Course

The main aim of the course is to train students on usage and applications of renewable sources to meet the increasing demand of the energy. This course enables the students to understand variable energy sources and need for finding alternate energy sources. It bestows knowledge about solar thermal energy, Biomass conversion, working of bio gas plant. The students get the awareness of conversion of waste to useful energy resources.

Pedagogical Outline

The duration of the course is one year which incorporates theory classes, assignments, quizzes and internal tests.

Eligibility

Students of all programmes are eligible to enrol for this course.

Scope of the Course

Careers related to this course are roles that involve natural and renewable resources to complete tasks and potentially help the environment. It often uses advanced technology to find solutions for enhancing energy efficiencies, decreasing pollution and conserving energy.

Certificate Course in Energy Resources		
Paper – I	Course Code: 2022ENR13	
Hrs: 30	Duration: 1 year	Credits: 2

Course Objectives

Objective of the course is to provide an understanding of the present energy crisis and various available energy sources.

Course Content

UNIT I

Introduction to energy sources

7L

World's reserve of commercial energy sources and their availability-India's production and reserves conventional and non-conventional sources of energy.

UNIT II

Solar Thermal Energy

8L

Solar Thermal Energy-Solar Spectrum-Solar radiation-Solar Radiation Geometry-Solar Distillation-Solar Disinfection-Solar Dying-Solar Cooker(Box Type)-Solar Water Heating Systems.

UNIT III

Biomass Energy

7L

Introduction-Biomass Classification-Biomass conversion Technologies-Bio-Gas generation- Factors affecting Bio-Digestion-Working of Bio-Gas Plant-Bio-Gas from plant waste.

UNIT IV

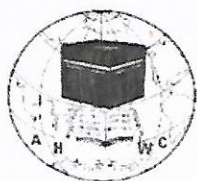
Other Energy Sources

8L

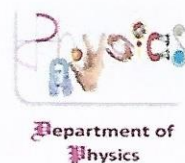
Classification and description of wind machines - Wind energy collections - Energy storage- Energy from oceans and chemical energy Resources - Ocean thermal electric conversion - Basic Principle.

Text Books

- 1.Kothari D.P.,K.C.Singal and Rakesh Ranjan, Renewable energy sources and emerging Technologies, Printice Hall of India,2008.
- 2.Solar Energy-Principles of thermal collection and storage-S.P.Sukhame-Tata-MCGraw-Hill publishing company ltd.



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CERTIFICATE COURSE

Department of Physics

offers

Certificate Course in Energy Resources

Course Outcomes

CO No.	<i>Expected Course Outcomes</i> <i>Upon completion of this course, the students will be able to:</i>	Cognitive Level
1	Understand the importance of conventional and nonconventional energy resources	Un / Re
2	Understand the applications, merits, and demerits of conventional and non-conventional energy resources.	Ap/ Un
3	Understand the basic aspects of solar energy.	Un
4	Understand the basic ideas of biomass energy and recognise their merits and demerits.	Un
5	Understand the basic principles of wind energy conversion.	Un

Cognitive Level: Re-Remember; Un-Understanding; Ap-Apply