UNIVERSITY OF KERALA

Open Course in PHYSICS

for the 5th semester students of CBCSS First Degree Programmes in subjects other than BSc Physics

SYLLABUS

Semester: **5** | Type of course: **Open Course**
Course Code: **PY1551.5** | Course Name: **ENERGY PHYSICS**
Instruction Hours/Week: **3** | Number of credits: **2**

UNIT 1 (7 hrs)

Various forms of energy – renewable and conventional energy systems – comparison – coal, oil and natural gas – availability – applications – merits and demerits.

UNIT 2 (10 hrs)

Solar energy - Solar radiation measurements, solar energy collector, principle of the conversion of solar radiation into heat, Solar energy storage, solar heaters, space cooling, solar ponds, solar cookers, solar distillation, solar furnaces, solar green houses, photovoltaic generation basics, merits and demerits of solar energy.

UNIT 3 (9 hrs)

Wind energy: Basic principle of wind energy conversion, basic components of wind energy conversion system, wind energy collectors. Energy storage, application of wind energy.

UNIT 4 (9 hrs)

Biomass energy, classification, photosynthesis, biomass conversion process, gobar gas plants, wood gasification, ethanol from wood, merits and demerits of biomass as energy source

UNIT 5 (9 hrs)

Energy from Oceans and Chemical energy resources: Ocean thermal energy conversion, energy from waves and tides – basic ideas, nature, applications, merits and demerits.

UNIT 6 (10 hrs)

Patterns of energy consumption in domestic, industrial, transportation and agricultural sectors – energy crisis and possible solutions – energy options for the developing countries – energy storage and hydrogen as a fuel (basics) – impact due to non-conventional energy sources – global warming.

Text books.

1. Non – Conventional Energy Resources by G. D. Rai, Khanna Publishers, 2008.
2. Solar Energy by G.D. Rai, 5th edition, 1995.
3. Solar Energy Fundamentals and Application by H.P. Garg and J. Prakash, Tata McGraw-Hill Publishing company ltd, 1997.
4. Solar Energy by S. P. Sukhatme, Tata McGraw- Hill Publishing company ltd, 1997.

REFERENCES:

1. Energy Technology by S. Rao and Dr. B.B. Parulekar, 1997, 2nd edition
2. Power Plant Technology by A. K. Wahil. 1993

PS: This is only a copy of the syllabus of the course, published by the University and is primarily intended to provide an easy reference to the students of the course. As the University is the final authority, as far as the syllabus of a course is concerned, the students are advised to verify that the University has not made subsequent changes in the syllabus of the course.

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