**Course Outline**

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| --- | --- |
| Course Code |  |
| Course Title | Everyday Science |
| Resource Person(s) | Dr. Jamil Anwar |
| Semester | Fall 2022 |
| Program | -- |
| Credit Hours | 3 |
| Duration | 16 weeks |
| Prerequisites | -- |
| Counselling Hours | -- |

**Chairperson/Director signature………………………………….**

**Dean’s signature……………………………**

**Date………………………………………….**

**Course Description:**.

Science is not limited to scientists and their laboratories. It is all around us and every one of us deals with science knowingly or unknowingly in our routine life. Our everyday life is full of scientific activities and we perform them in routine without giving a thought to the complexity and depth of scientific knowledge involve in that. Since we get up from bed early in the morning to go back to bed for sleep late night science is all around us. For example we ignite our stove in the kitchen with the help of a match stick. Did we ever think that how heat is produced which ignited the reddish bead at the top of the stick into a flame or what chemical reactions are involved in this action which looks simple but it is not so simple. Whether we are in kitchen or office or mall or driving on a road scientific phenomena are all around us. Even if we leave aside the modern gadgets of science and technology like our cell phone or laptop, which are difficult to understand how they work, nature around us is full of science. Hundreds of natural phenomena which we observe in our daily life like white clouds floating in blue sky, blooming of flowers in our garden and cooking of delicious food in our kitchen are purely scientific activities. There would be little exaggeration if one says that nature is the second name of science. Our daily life could be more meaningful and interesting if we learn and understand the basic science involved in natural occurrings around us as well as in man-made devices in our daily use. This course is designed to provide the basic understanding of the scientific knowledge in the activities which come across in our daily life. This understanding could be the first step for those who want to excel in different scientific fields in their future life**. The basic objective of this course is to cultivate scientific curiosity in student’s mind.**

**Course Learning Outcomes:**

The basic objective of this course is to give the basic understanding to the students regarding various natural and man-made phenomenon of science occurring around us in everyday life. The major objectives of the course are as follows:

1. To cultivate curiosity in student’s mind to investigate apparently simple phenomena in everyday life on scientific basis.
2. To enable the participants to observe, think and correlate the routine activities of life like cleaning, cooking and rusting etc. with the scientific knowledge they possessed so far.
3. To learn and understand the scientific phenomenon involved in modern gadgetry like cell phone, magnetic train and microwave oven etc.
4. To have the knowledge about history of scientific inventions like X-Ray or LASER.
5. To learn and understand the physical and chemical changes going inside the human body and the role of food and different chemicals.
6. To awake the urge of scientific knowledge, how correlation of energy and matter can be understood and how the things work.
7. To learn how to get answers for a number of “Whys” which one curious mind always in search of.

**Mapping of CLOs to Program Learning Outcomes (PLOs):**

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **CLO’s/PLO’s** | **CLO 1** | **CLO 2** | **CLO 3** | **CLO 4** | **CLO 5** | **CLO 6** | **CLO 7** |
| 1: Enhancing Knowledge | **✔** |  | **✔** | **✔** | **✔** |  |  |
| 2: Problem Analysis | **✔** |  | **✔** |  | **✔** | **✔** | **✔** |
| 3: Designing Skills |  | **✔** |  |  |  | **✔** |  |
| 4: Innovative Thinking | **✔** | **✔** |  |  |  | **✔** | **✔** |

**Teaching Methodology:**

Classroom lectures and discussions, problem solving exercises and assignments.

**Grade Evaluation Criteria**

|  |  |
| --- | --- |
| **Components** | **Marks in Percentage** |
| Assignments | 10% |
| Quizzes | 10% |
| Activities | 5% |
| Mid Term Exam | 25% |
| Attendance & Class Participation | ----% |
| Final Exam | 50% |
| Total | 100% |

**Recommended Books:**

* The Science of Everyday Life

By [Len Fisher](https://www.simonandschuster.com/authors/Len-Fisher/154332358)

Published by Arcade, Distributed by Simon & Schuster

# New Science in Everyday Life

By Vaishali Gupta & Anuradha Gupta

ISBN: 9780190121969

Publication date: 15/10/2019

Oxford University Press India

* Science Education for Everyday Life

By Glen. S. Aikenhead (2005)

ISBN 13: 9781423787822

Teachers College Press,

Columbia University, New York and London

* The Science of everyday Life

By Marti Jopson Michael O”Mara Books Limted

2015, 9 Lion Yard, SW4, 7NQ, LONDON.

* The World of Science in Everyday Life

Colin A. Ronan, H. Holt, 1993 - Science

* Science in Everyday Life

Ellsworth Scott Obourn, Elwood David Heiss, Gaylord C. Montogomery

Van Nostrand, 1958 - Science –

* Science in Everyday Life

William Charles Vergara

Harper & Row, 1980 - Juvenile Nonfiction

**Course Calendar**

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| **Week** | **Lecture** | **Topics** |
| I | 1 & 2 | Introduction of the course; Miscellaneous activities of everyday life; How ballpoint works; Diamond and Graphite; Law of motion used in flying and swimming; processing of natural rubber; Why chameleon changes colour? |
| II | 3 & 4 | Balanced diet; Nutrients; Vitamins; Minerals; Fats and Proteins; Milk; Chemicals in Food; Artificial colours, sweeteners and flavors used in food; Food digestion process in human body. Digestive track; |
| III | 5 & 6 | Water on Earth; Water cycle; Significance of water for life; structure of water molecule and brief chemistry of water; Water as a unique substance; Snowflakes; Why ice floats? Why water pipe bursts in winter? Directional freezing. |
| IV | 7 & 8 | Cleaning action; Surface tension; What are surfactants; Saponification; How soap works; What are detergents; Shampoos; Tooth paste; what is rusting. Science involved in rusting and architecture engineering. |
| V | 9 & 10 | Sound waves; thundering; velocity of sound; Echo; SONAR; Applications of ultrasonic waves; How telephone and radio works (AM & FM radio); Applications of Electromagnetism; MRI Scan; Electric motor and generator; Microwave oven; Magnetic train; Aurora (Polar lights). |
| VI | 11 & 12 | Degradation of environment; Greenhouse effect; global warming and consequences; Acid rain; artificial rain; Types of SMOG; Clouds; lightning strike and its control, Climate change impact. |
| VII | 13 & 14 | Voltic pile and development of battery; Electrochemical cell; How a car battery works; Dry cell; Solar cells; Lithium Ion Battery; Ear and tooth ache during air travel; Air pressure in a plane’s cabin. |
| VIII | 15 & 16 | Drugs and medicines; working mechanism of drugs; Types of drugs; Antiseptic; Analgesics; Antibiotics; Tranquilizers; Plastic invention; Biodegradable plastics; Types of plastics; Plastic Pollution contribution |
| IX | 17 & 18 | Science of emotions; Neurotransmitters; Basic emotions; Chemistry of emotions; Chemistry of Love, Anger, Happiness, and sleep. How we smell, What is taste? Taste and flavor; Loss of taste and smell in COVID-19. |
| X | 19 & 20 | Why sky looks blue; Properties of light; Why stop signs are always red? Fluorescence; X-rays; How firefly gives light; How speed gun works; Doppler effect; What is Mirage? Sunshine and production of Vitamin D; |
| XI | 21 & 22 | What is fire; Lightening of matchstick; Combustion and photosynthesis; Fire extinguishers; Why onion cutting cause tearing? Preservation of food; Baking process; Hardening of egg on cooking; Bad eggs give rotten smell. |
| XII | 23 & 24 | Elements in human body and their functions; Perspiration; Why sweating? Different types of sweating; Sources of indoor pollution; Major indoor pollutants; Health effects of indoor pollutants; Smoke as a indoor pollutant. |
| XIII | 25 & 26 | Photosynthesis and respiration in plants; Chlorophyll and other pigments in plants’ Natural polymers produced by plants; Lignin; Natural rubber; Why plants drop leaves in winter; Why plant leaves turn yellow in autumn? |
| XIV | 27 & 28 | Why do we cook food; Cooking under pressure; Chemicals in our food and their impact on our body; Toxic effects of smoking; Chemicals in cigarette smoke; Toxic effects of drinking alcohol on human body. |
| XV | 29 & 30 | Cosmetics; Constituents of make-up; Sunscreen; Mouthwash; Chemistry of hair; Essential elements for healthy hair growth; Curly and straight hair; Blonde hair, Colouring of hair; Hair spray; |
| XVI | 31 & 32 | Synthetic Materials of modern age; Uses and applications of Synthetic materials: Synthetic leather; Synthetic rubbers, Types of synthetic rubber; Synthetic Fibers and Synthetic Fertilizers. |

**Mapping of CLOs to Direct Assessments**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CLOs▼** | Quiz 1 | Quiz 2 | Quiz 3 | Quiz 4 | Quiz 5 | Quiz 6 | Assignment | Creative Activity | Mid-term Exam | Final Exam |
| 1 | ✔ |  | ✔ | ✔ |  |  | ✔ | ✔ | ✔ | ✔ |
| 2 |  | ✔ |  |  | ✔ |  |  | ✔ | ✔ | ✔ |
| 3 | ✔ | ✔ | ✔ |  |  | ✔ |  | ✔ | ✔ | ✔ |
| 4 |  |  |  | ✔ |  |  | ✔ |  | ✔ | ✔ |
| 5 |  |  |  | ✔ |  | ✔ | ✔ |  | ✔ | ✔ |
| 6 |  |  | ✔ |  |  |  |  | ✔ | ✔ | ✔ |
| 7 |  | ✔ |  |  | ✔ | ✔ |  | ✔ | ✔ | ✔ |