COTTON COLLEGE STATE UNIVERSITY

One Credit Course Syllabus

for

HISTORY OF SCIENCE

Paper Code: HSC 101CMP
HISTORY OF SCIENCE
Credits: 1
(16 lectures)

PHYSICAL SCIENCE

Measuring, Charting and Modelling the Heavens (brief overview of Greek Science); Copernicus and his model of the Universe; Galileo and his contributions to mechanics and cosmology; Kepler and the laws of planetary motion; Isaac Newton's *Philosophiæ Naturalis Principia Mathematica*, gravity.

Development of quantum physics and relativity (e.g. Heisenberg, Bohr, Schroedinger, Born, de Broglie, Planck, Einstein, Dirac); model of the atom; photoelectric effect; blackbody spectrum; velocity of light; special theory of relativity; general theory of relativity; models of the Universe.

CHEMICAL SCIENCE

Early understanding of Chemistry: Democritus and the atom, Aristotle's views, advent of alchemists and development of Chemistry as distinct from alchemy (Robert Boyle's *The Sceptical Chymist)*; understanding of combustion; Dalton's atomic theory; discovery of elements and the composition of air; Antoine-Laurent de Lavoisier- the father of modern chemistry; Volta and electrochemistry; laws of chemical reactions; development of the periodic table; discovery of noble gases and radioactivity; Kekule and the development of organic chemistry, polymers, biomolecules, fullerenes; molecular biology and biochemistry.

MATHEMATICAL SCIENCE

Early Sumerian/Babylonian and Egyptian mathematics; Greek Mathematics and the Pythagorean school; Euclid the father of geometry, and author of "Elements"; Indian mathematics: Brahmagupta, zero and the Hindu numeral system, Madhava and the Kerala school; Islamic mathematics, Al-Kharizmi and the growth of algebra; European mathematics during the Renaissance period: Descarte, Fermat, Pascal, Newton, Leibniz; Bolyai, Lobachevski and Riemann: non-Euclidean geometry; Gauss and his contributions; Hardy and Ramanujan.

LIFE SCIENCES

Classification of species: early attempts by Aristotle (Scala naturae) to the present-day scheme attributed to Carolus Linnaeus, the father of taxonomy; Leonardo's anatomical drawings and Harvey's discovery of the circulation of blood; development of the microscope and recognition of cellular structure (Robert Hooke; Anton van Leeuwenhoek); Rev. Thomas Malthus' theory of population size; Lamarckism; Darwin's theory of evolution and his monumental work: *The Origin of Species*; early debates on sterilization and Pasteur's work disproving the theory of spontaneous generation; Gregor Johann Mendel and the development of genetics; Watson and Crick's discovery of the structure of DNA; mapping the human genome; theories on the origin of life; biotechnology.

Suggested resource material:

Finley, Alexander, 1965. A hundred years of chemistry, London: Duckworth & Co.
https://archive.org/details/hundredyearsofch029685mbp.

History of biology
http://biology.clc.uc.edu/courses/bio104/hist_sci.htm

History of chemistry
http://www.columbia.edu/itc/chemistry/chem-c2507/navbar/chemhist.html

History of mathematics
http://www.storyofmathematics.com/story.html

History of physics - online resource from American Institute of Physics
http://www.aip.org/history/links.html#history
http://aip.org/history-programs

UCMP (University of California Museum of Palaeontology) History of Biology List
http://www.ucmp.berkeley.edu/help/topic/history.html

Wikipedia
http://en.wikipedia.org/wiki/History_of_biology
http://en.wikipedia.org/wiki/History_of_biotechnology
http://en.wikipedia.org/wiki/History_of_chemistry
http://en.wikipedia.org/wiki/History_of_mathematics
http://en.wikipedia.org/wiki/History_of_physics