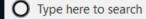


## Hollywood Movies

























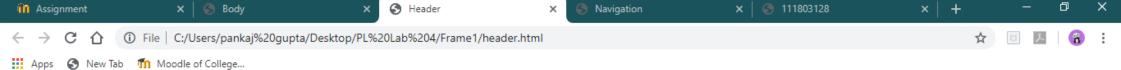






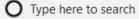






## MOVIES

























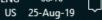


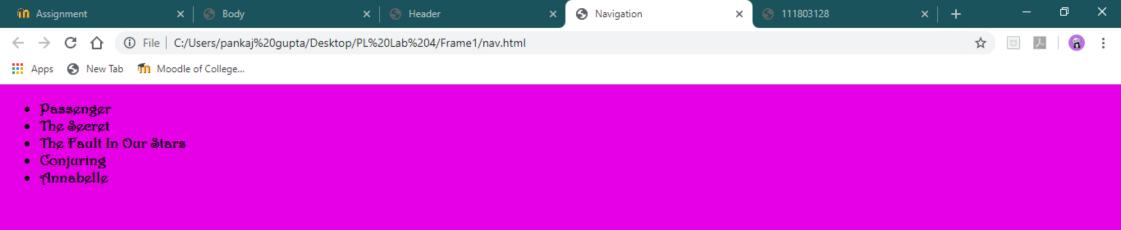


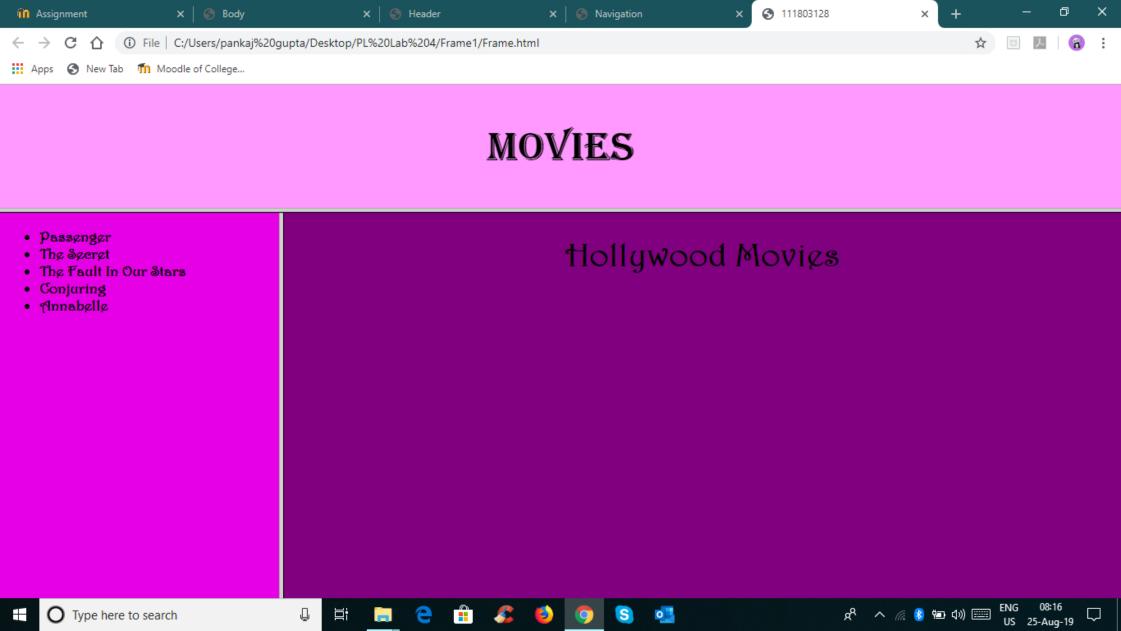


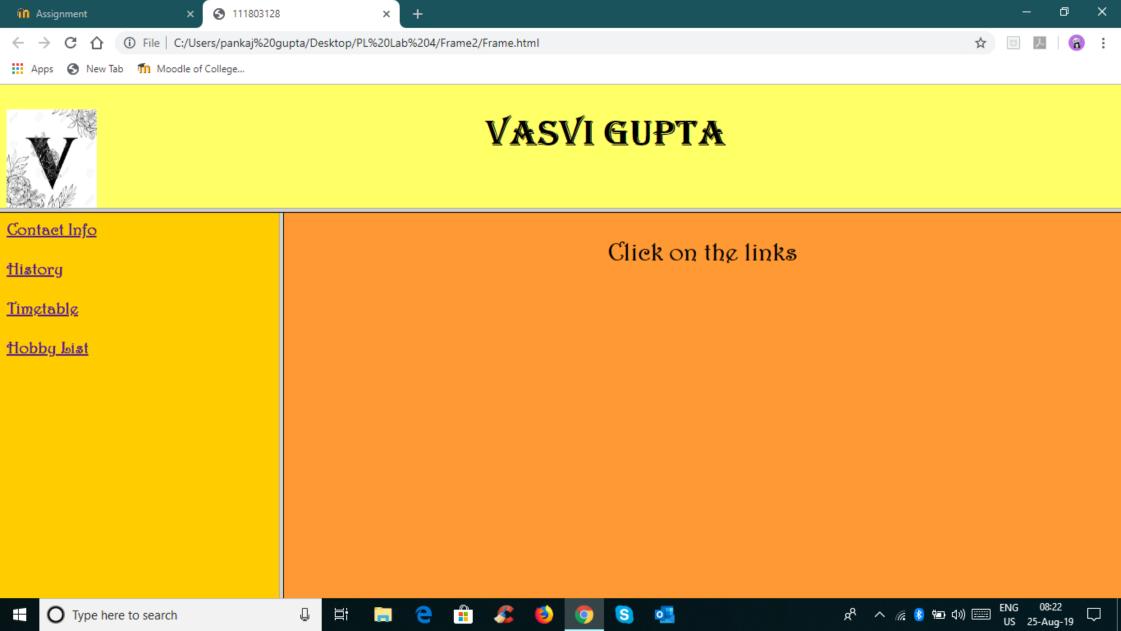


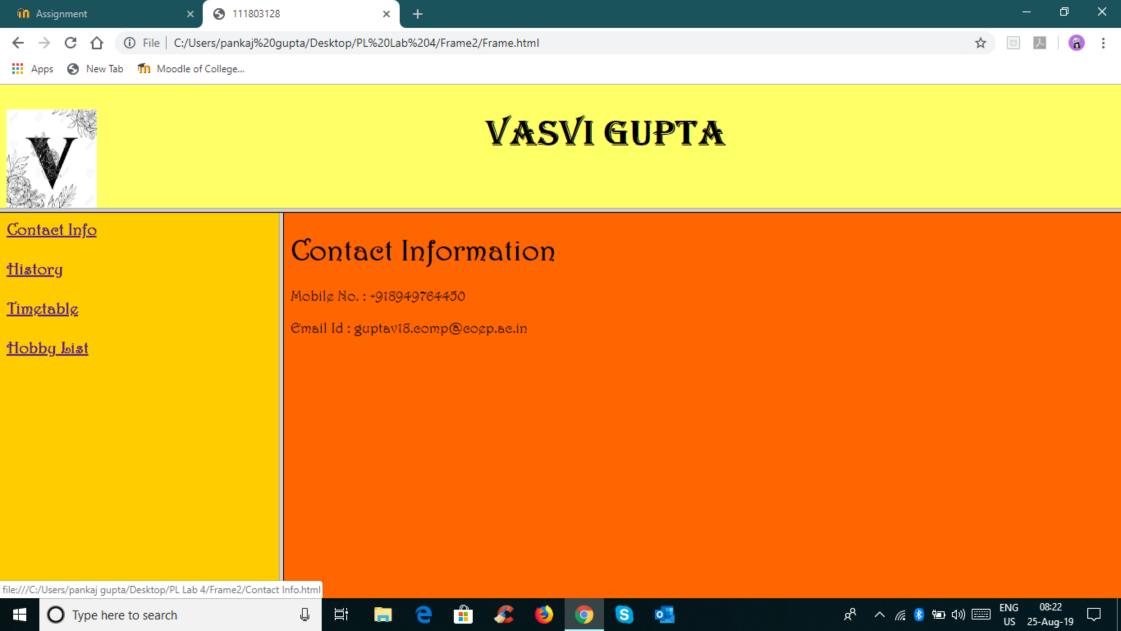








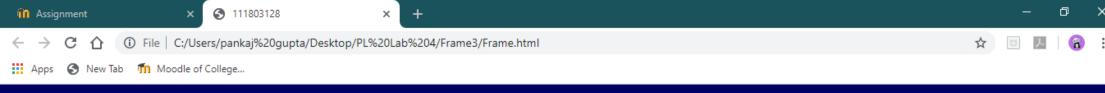












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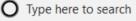
- General Information
- Course Description
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- Requirements

Science of Living Systems

biving systems are open self-organizing life forms that interact with their environment. These systems are maintained by flows of information, energy and matter. Some scientists have proposed in the last few decades that a general living systems theory is required to explain the nature of life. Such a general theory, arising out of the ecological and biological sciences, attempts to map general principles for how all living systems work. Instead of examining phenomena by attempting to break things down into components, a general living systems theory explores phenomena in terms of dynamic patterns of the relationships of organisms with their environment.

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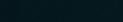














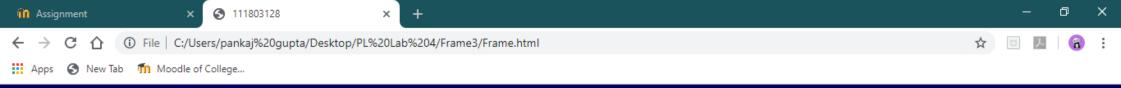












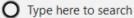
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#### Course Description

This course will introduce the student to contemporary Systems Biology focused on mammalian cells, their constituents and their functions. Biology is moving from molecular to modular. As our knowledge of our genome and gene expression deepens and we develop lists of molecules (proteins, lipids, ions) involved in egllular processes, we need to understand how these molecules interact with each other to form modules that act as discrete functional systems. These systems underlie core subcellular processes such as signal transduction, transcription, motility and electrical excitability. In turn these processes come together to exhibit eellular behaviors such as secretion, proliferation and action potentials. What are the properties of such subcellular and cellular systems? What are the mechanisms by which emergent behaviors of systems arise? What types of experiments inform systems-level thinking? Why do we need computation and simulations to understand these systems?























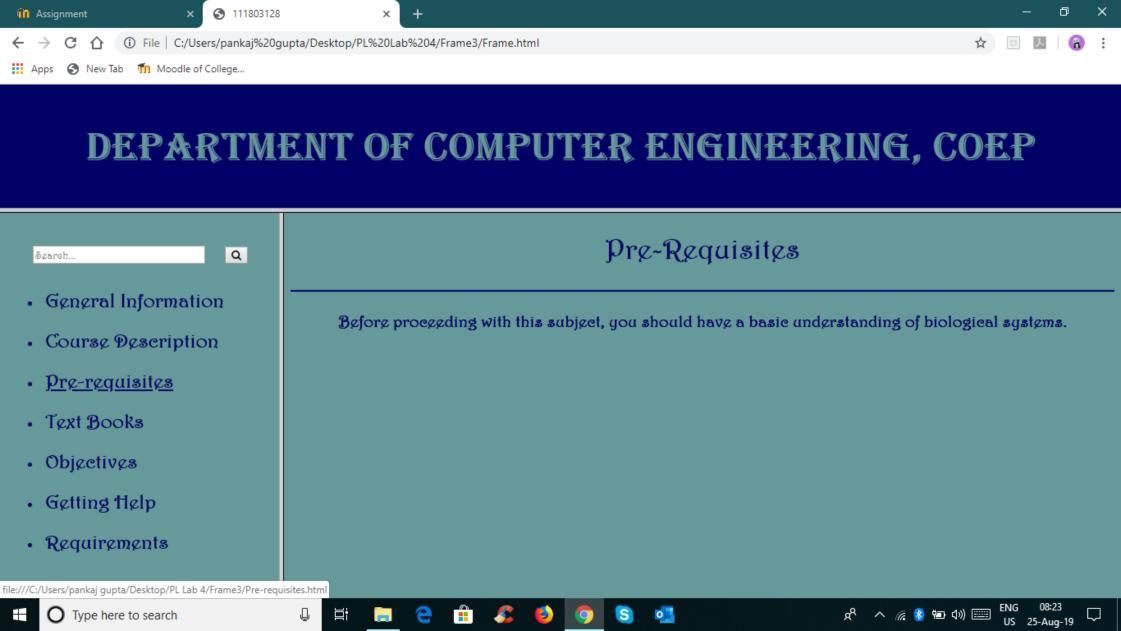


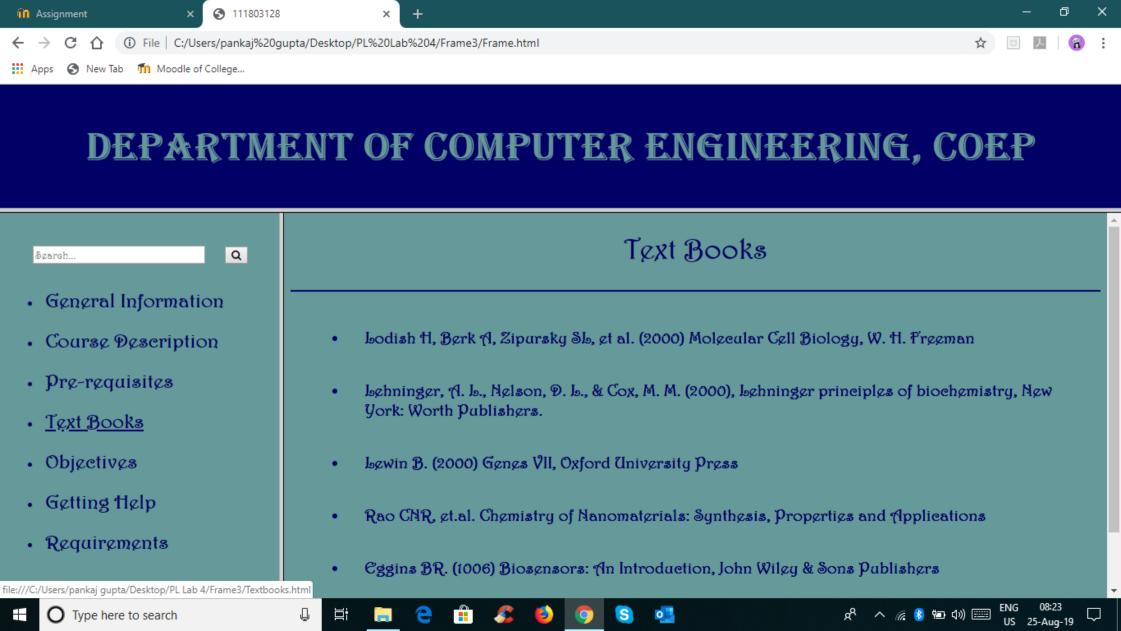














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#### Objectives

- To make students conversant with basic Biology regarding the life processes.
- To impart knowledge about the common corridors of biology and engineering as biologically inspired technologies like designs in nature, bioenergeties, bioprocesses, biomaterials, biomechanics, bioimaging, bioinformatics, bioinstrumentation etc.
- To introduce recent trends in biology viz. genetic & tissue engineering, stem cell engineering, bio and nanotechnology etc. with the objective of appreciating engineering principles in biological systems.

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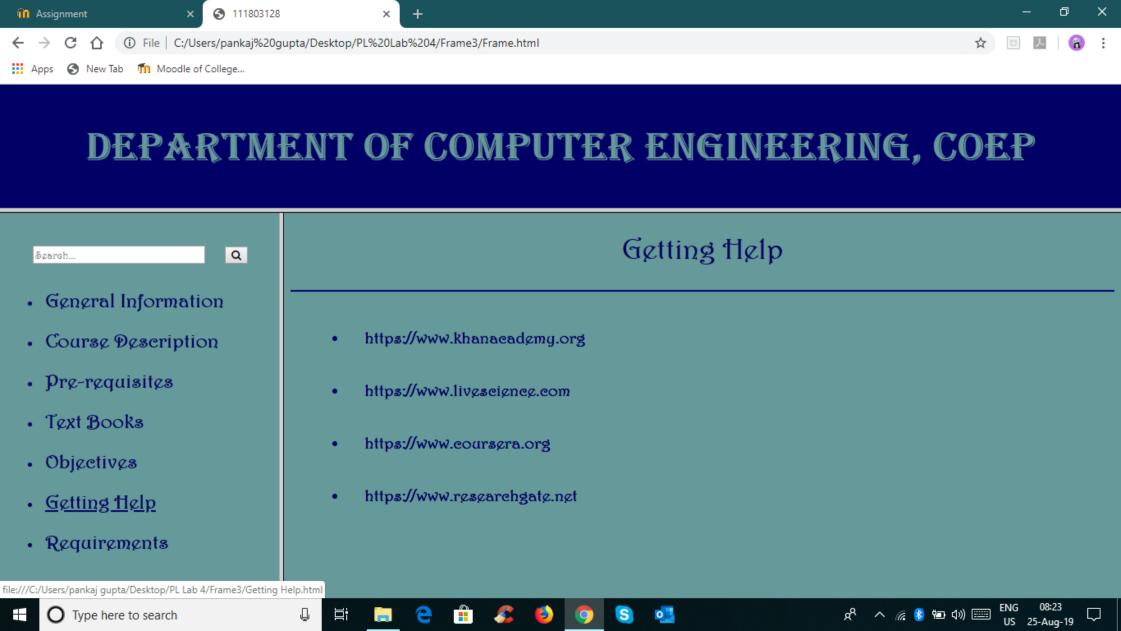


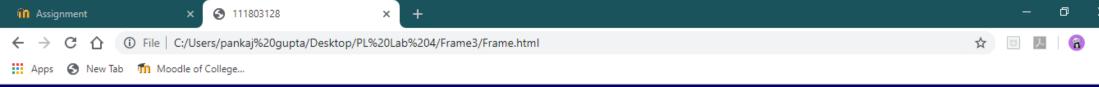












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# Requirements

bearn about ATP. A brief introduction:

Just as living things must continually consume food to replenish their energy supplies, cells must continually produce more energy to replenish that used by the many energy-requiring chemical reactions that constantly take place. Together, all of the chemical reactions that take place inside cells, including those that consume or generate energy, are referred to as the cell's metabolism. A living cell cannot store significant amounts of free energy. Free energy is energy that is not stored in molecules. Excess free energy would result in an increase of heat in the cell, which would denature enzymes and other proteins, and destroy the cell. Instead, a cell must be able to store energy safely and release it for use only as needed. biving cells accomplish this using ATP, which can be used to fill any energy need of the cell. How? It functions like a rechargeable battery. When ATP is broken down, energy is released. This energy is used by the cell to do work. For example, in the mechanical work of muscle contraction, ATP supplies energy to move the contractile muscle proteins.

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