

## Course Outline/Scope and Sequence of Conceptual and Process Topics

### Scope and Sequence of Biotechnology 1

#### Concepts/Lectures/Readings

Biotechnology Past/Present

DNA and Protein Structure/Function

### Scope and Sequence of Biotechnology 2

#### Concepts/Lectures/Readings

Assay Development

Recombinant DNA Technology

Transformation /Genetic Engineering

Scale-up, Manufacturing, Marketing

#### Process/Laboratory work

Setting up a Legal Scientific Notebook  
Safety in the Biotech Laboratory  
Internet/WWW Research, Word®, Excel®, PowerPoint®  
Scientific Methodology Laboratory  
Model Organism Growth/Media Preparation  
Sterile Technique/Cell Culture  
Solution and Dilution Preparation

DNA Isolation and Indicator Analysis  
Agarose Gel Electrophoresis,  
DNA Synthesis and Lambda PCR  
Protein Isolation and Indicator Analysis  
Polyacrylamide Gel Electrophoresis  
Protein and Enzyme Studies/Assays

#### Process/Laboratory work

Amylase Assay Development-  
Spectrophotometry to Study Molecules  
Protein Concentration Assays

Recombinant Plasmid /Cloning Vectors  
Restriction Digestion and Restriction Enzyme Mapping  
Agarose Gel Electrophoresis Analysis

Cell Competency  
Bacterial Transformation and Selection

Cell Culture, Growth and Monitoring  
Protein Product Purification and Testing  
Product Pipelines and Industry Applications  
Disease and Medicine  
Clinical Testing and Regulations  
Bioethics and Decision-Making