STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

Course Schedule – November 2016 – April 2017

Department : **Biotechnology**

Name of the Faculty : **Dr.K.Veena Gayathri**

Course Title : **RECOMBINANT DNA TECHNOLOGY**

Course Code : **15BY/PC/RD24**

Shift : **II**

Week & No. of hours	Units & Topics	Teaching Methodology	Text & References	Method of Evaluation
Nov. 14 - 19, 2016 (Day Order 1 to 6)	**Unit 1** **Introduction to Genetic Engineering and Recombinant DNA Technology** Introduction to Genetic Engineering and Recombinant DNA Technology Restriction Modification Systems - Types and Nomenclature and Restriction Enzymes: TYPE I, II, III DNA Ligase- Properties and Specificity	Lecture: power point presentation Black Board	T.A Brown "Gene Cloning and DNA Analysis" & Primrose "Principles of Gene Manipulation: An Introduction to Genetic Engineering".	Short Answers Test on Enzymes
Nov. 21 - 28, 2016 (Day Order 1 to 6)	Other Enzymes Used in Recombinant DNA Technology - S1 Nuclease, BAL 31 Nuclease DNA Polymerase, Polynucleotide Kinase, Phosphatase, Reverse Transcriptase Activity and Mode of Action	Lecture: power point presentation	T.A Brown "Gene Cloning and DNA Analysis" & Primrose	Test / Multiple Choice Questionnaire

Nov. 29 – Dec 5, 2016 (Day Order 1 to 6)	**Unit 2** Plasmids- Properties, Incompatibility, Isolation and Purification Techniques	Lecture – power point presentation Black Board	.A Brown "Gene Cloning and DNA Analysis" & Primrose "Principles of Gene Manipulation: An Introduction to Genetic Engineering".	**III Component** **Assignment on Nov 29th** Properties on Plasmids and Types of Plasmids
Dec 6 - 14, 2016 (Day Order 1 to 6)	Plasmid Vectors and their Properties, Copy Number, pBR 322, pUC, pGEM3Z – its Construction and Derivatives, Single Stranded Plasmids	Lecture – power point presentation	.A Brown "Gene Cloning and DNA Analysis" & Primrose "Principles of Gene Manipulation: An Introduction to Genetic Engineering".	**Essay type Test on pBR 322**
Dec. 15 - 21, 2016 (Day Order 1 to 6)	Bacteriophage lambda (λ) as a Vector- Essential Features, Organization of Genome, General Structure, Rationale for Vector Construction Cosmids, Phasmids, Fosmids, Phagemids	Lecture – power point presentation Black Board	.A Brown "Gene Cloning and DNA Analysis" & Primrose "Principles of Gene Manipulation: An Introduction to Genetic Engineering".	Group discussion On different types of Vectors at its application
Jan. 03- 09, 2017 (Day Order 1 to 6)	Filamentous Phage Vectors, L Zap, L Blue Print Vectors, Shuttle Vectors, Expression Vectors, Promoter Probe Vectors, Vectors for Library Construction, Linkers, Adaptors, Homopolymer Tailing	Lecture – power point presentation	.A Brown "Gene Cloning and DNA Analysis" & Primrose "Principles of Gene Manipulation: An Introduction to Genetic Engineering".	**III Component** **Jan 4th** **Test on Expression Vectors**

Jan. 10- 17, 2017 (Day Order 1 to 6)	**Unit 3** Expression Vectors - Expression of Foreign DNA in Bacteria- Fusion Protein and in *Pichia sp*. Expression System	Lecture – power point presentation Black Board	Primrose "Principles of Gene Manipulation: An Introduction to Genetic Engineering".	**III Component Seminar Presentation**
Jan. 18- 20, 2017 (Day Order 1 to 3)	YACs, BACs, PACs, MACs and HACs	Lecture – power point presentation	A Brown "Gene Cloning and DNA Analysis" & Primrose "Principles of Gene Manipulation: An Introduction to Genetic Engineering".	**III Component Seminar Presentation**
Jan.23 - 28, 2017	**C.A. Tests**			
Jan.30 – Feb 01, 2017 (Day Order 4 to 6)	**Unit 4** Shotgun Cloning - Genomic Library and cDNA Library Construction- Marker Genes , Recombinant Selection and Screening	Lecture –power point presentation	.A Brown "Gene Cloning and DNA Analysis" & Primrose "Principles of Gene Manipulation: An Introduction to Genetic Engineering".	**III Component Seminar Presentation**
Feb.02 - 09, 2017 (Day Order 1 to 6)	DNA Sequencing and Polymerase Chain Reaction- its Principle, Types and Applications, Site Directed Mutagenesis	Lecture –power point presentation	.A Brown "Gene Cloning and DNA Analysis" & Primrose "Principles of Gene Manipulation: An Introduction to	**Open Book – Review with the Department Library Books**

			Genetic Engineering".	
Feb.10 - 17, 2017 (Day Order 1 to 6)	Molecular Markers and its Applications - RFLP, RAPD, AFLP, VNTR, STS, SSCP, SSR, CAPS, SCAR	Lecture –power point presentation Black Board	.A Brown "Gene Cloning and DNA Analysis" & Primrose "Principles of Gene Manipulation: An Introduction to Genetic Engineering".	**Group Discussion**
Feb.20 - 27, 2017 (Day Order 1 to 6)	**Unit 5** Modern Biotechnology – Products Using Gene Cloning – Monoclonal Antibodies, Insulin, Growth Hormones, Vaccines	Lecture –power point presentation Black Board	.A Brown "Gene Cloning and DNA Analysis" & Primrose "Principles of Gene Manipulation: An Introduction to Genetic Engineering".	**Journal Review article- Discussion**
Feb.28 – Mar 07, 2017 (Day Order 1 to 6)	Gene Therapy for Inherited Disorders and Neoplastic Disorders	Lecture –power point presentation Black Board	.A Brown "Gene Cloning and DNA Analysis" & Primrose "Principles of Gene Manipulation: An Introduction to Genetic Engineering".	**Journal Review article- Discussion**
Mar. 6 - 16, 2017	**C.A. IMPROVEMENT TESTS**			
Mar. 08 - 15, 2017 (Day Order 1 to 6)	Genetically Modified Organisms in	Lecture –power	.A Brown "Gene Cloning and DNA	**Open Book – Review with the**

	Industry – *Pseudomonas* sp., *Bacillus thuringiensis*	point presentation	Analysis" & Primrose "Principles of Gene Manipulation: An Introduction to Genetic Engineering".	**Department Library Books**
Mar. 16, 2017 (Day Order 1)	Revision on the chapters			Test /Questionnaire
Mar. 17 - 23, 2017 (Day Order 2 to 6)	**REVISION**			
March 24, 2017 (Day Order 1)				

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

Course Schedule – November 2016 – April 2017

Department : **BIOTECHNOLOGY**

Name/s of the Faculty : **Dr. Aruna sharmili S. and Dr. J. Anbumalarmathi**

Course Title : **ANIMAL AND PLANT BIOTECHNOLOGY**

Course Code : **15BY/PC/AP24**

Shift : **II**

Week & No. of hours	Units & Topics	Teaching Methodology	Text & References	Method of Evaluation
Nov. 14 - 19, 2016 (Day Order 1 to 6) 5hrs.	**Animal Biotechnology** **Unit 1** **Animal Cell Culture** 1.1 Animal Tissue culture -Historical Background; Aseptic Techniques, Culture Vessels and Substrates **Plant Biotechnology** **Unit 3** **Plant Tissue Culture** 3.1Plant Tissue Culture: Principles and Methodology. Protoplast Technology	Lecture: Power point presentation Lecture: Power point presentation	Freshney, Ian R. *Culture of Animal Cells: A Manual of Basic Technique*, 6th ed., Wiley-Liss. 2010. Chawla, H.S. *Introduction to Plant Biotechnology*. 3rd ed. Oxford and IBH Pub. 2009. Slater, A., Scott, N and Fowler, M. *Plant biotechnology* Oxford Univ. Press. 2003.	Group discussion Quiz - oral
Nov. 21 - 28, 2016 (Day Order 1 to 6) 5hrs.	**Animal Biotechnology** **Unit 1** 1.2 Defined Media and Supplements- Serum Free Media- Preparation and Sterilization **Plant Biotechnology** **Unit 3** 3.1 Somatic Embryogenesis	Lecture: Power point presentation Lecture: Power point presentation	Freshney, Ian R. *Culture of Animal Cells: A Manual of Basic Technique*, 6th ed., Wiley-Liss. 2010. Chawla, H.S. *Introduction to Plant Biotechnology*. 3rd ed. Oxford and IBH Pub. 2009. Slater, A., Scott, N and Fowler, M. *Plant biotechnology* Oxford Univ. Press. 2003.	Viva voce Quiz - oral

Nov. 29 – Dec 5, 2016 (Day Order 1 to 6) 5hrs.	**Animal Biotechnology** **Unit 1** 1.3 Primary Cell Culture- Subculture **Plant Biotechnology** **Unit 3** 3.2 Somaclonal Variation, Synthetic Seeds	Lecture: Power point presentation Lecture: Power point presentation	Freshney, Ian R. *Culture of Animal Cells: A Manual of Basic Technique*, 6th ed., Wiley-Liss. 2010. Chawla, H.S. *Introduction to Plant Biotechnology*. 3rd ed. Oxford and IBH Pub. 2009. Slater, A., Scott, N and Fowler, M. *Plant biotechnology* Oxford Univ. Press. 2003.	Viva voce Group discussion
Dec 6 - 14, 2016 (Day Order 1 to 6) 5hrs.	**Animal Biotechnology** **Unit 1** 1.3 Cell Line- Quantitation – Contamination **Plant Biotechnology** **Unit 3** 3.2 Production of Secondary Metabolites	Lecture: Power point presentation Lecture: Black board	Freshney, Ian R. *Culture of Animal Cells: A Manual of Basic Technique*, 6th ed., Wiley-Liss. 2010. Chawla, H.S. *Introduction to Plant Biotechnology*. 3rd ed. Oxford and IBH Pub. 2009.	Viva voce Test – short answers
Dec. 15-21, 2016 (Day Order 1 to 6) 5hrs.	**Animal Biotechnology** **Unit 1** 1.4 Cryopreservation **Plant Biotechnology** **Unit 3** 3.3 Production of Haploid Plants. Germplasm Conservation	Lecture: Power point presentation Lecture: Black board	Freshney, Ian R. *Culture of Animal Cells: A Manual of Basic Technique*, 6th ed., Wiley-Liss. 2010. Chawla, H.S. *Introduction to Plant Biotechnology*. 3rd ed. Oxford and IBH Pub. 2009.	Viva voce Test - oral
Jan. 03-09, 2017 (Day Order 2 to 6)	**Animal Biotechnology** **Unit 1** 1.4 Cytotoxicity	Lecture: Power point presentation	Freshney, Ian R. *Culture of Animal Cells: A Manual of Basic Technique*, 6th	Group discussion

5hrs.	Plant Biotechnology **Unit 4** **Gene Transformation Technologies and Applications in Plants** 4.1 Selectable and Scoreable Markers, Reporter Genes and Promoters Used in Plant Vectors	Lecture: Black board	ed., Wiley-Liss. 2010. Chawla, H.S. *Introduction to Plant Biotechnology***.** 3rd ed. Oxford and IBH Pub. 2009.	Group discussion
Jan.10 - 17, 2017 (Day Order 1 to 6) 5hrs.	**Animal Biotechnology** **Unit 2** Cloning and Transgenic Animals 2.1 IVF and ART, Embryo Transfer, Pregnancy and Prenatal Diagnosis **Plant Biotechnology** **Unit 4** 4.2 Techniques for Plant Transformation – Agrobacterium – Mediated Gene Transfer, direct gene transfer methods. Chloroplast transformation	Lecture: Power point presentation Lecture: Power point presentation	Houdevine, Louis –Marie. Transgenic animals: Generation and use, USA: CRC.1997 Chawla, H.S. *Introduction to Plant Biotechnology***.** 3rd ed. Oxford and IBH Pub. 2009. Slater, A., Scott, N and Fowler, M. *Plant biotechnology* Oxford Univ. Press. 2003.	**III component**-**Scrap book**-IVF and ART (Date of submission - January 11, 2017) Test - oral
Jan.18 - 25, 2016 (Day Order 1 to 6) 5hrs.	**Animal Biotechnology** **Unit 2** 2.2 Cloning by Species **Plant Biotechnology** **Unit 4** 4.3 GM Strategies for Insect Resistance –	Lecture: Power point presentation	Houdevine, Louis –Marie. Transgenic animals: Generation and use, USA: CRC.1997 Chawla, H.S. *Introduction to Plant Biotechnology***.** 3rd ed. Oxford and IBH	Viva voce Debate- Pros and cons of GMO

	Environmental Impact of BT Crops	Lecture: Power point presentation	Pub. 2009. Slater, A., Scott, N and Fowler, M. *Plant biotechnology* Oxford Univ. Press. 2003.	
Jan.18 – 20, 2017 (Day Order 1 to 3) 2hrs.	**Animal Biotechnology** **Unit 2** 2.3 Transgenic Animals: Production and Application **Plant Biotechnology** **Unit 4** 4.4 Transgenics for Abiotic Stress Tolerance and Cytoplasmic Male Sterility	Lecture: Black board Lecture: Power point presentation	Houdevine, Louis –Marie. Transgenic animals: Generation and use, USA: CRC.1997 Chawla, H.S. *Introduction to Plant Biotechnology*. 3rd ed. Oxford and IBH Pub. 2009. Slater, A., Scott, N and Fowler, M. *Plant biotechnology* Oxford Univ. Press. 2003.	Group discussion Quiz - oral
Jan.23 - 28, 2017	**C.A. Tests**			
Jan.30 – Feb. 01, 2017 (Day Order 4 to 6) 3hrs.	**Animal Biotechnology** **Unit 2** 2.3 Transgenic Animals in Livestock Improvement **Plant Biotechnology** **Unit 5** **Applications of Plant Genetic Engineering** 5.1 Molecular Farming: Carbohydrates and Proteins	Lecture: Black board Lecture: Power point presentation	Houdevine, Louis –Marie. Transgenic animals: Generation and use, USA: CRC.1997 Chawla, H.S. *Introduction to Plant Biotechnology*. 3rd ed. Oxford and IBH Pub. 2009. Slater, A., Scott, N and Fowler, M. *Plant biotechnology* Oxford Univ. Press. 2003.	Viva voce Group discussion
Feb.02 - 09, 2017 (Day Order 1 to 6) 5hrs.	**Animal Biotechnology** **Unit 2** 2.3 Transgenic Animals as Model for Human Diseases **Plant Biotechnology**	Lecture: Power point presentation	Houdevine, Louis –Marie. Transgenic animals: Generation and use, USA: CRC.1997 Chawla, H.S. *Introduction*	Viva voce

	Unit 5 5.2 Plants as Bioreactors: Antibodies, Foreign Proteins in Plants and Edible Vaccines	Lecture: Power point presentation	*to Plant Biotechnology***.** 3rd ed. Oxford and IBH Pub. 2009. Slater, A., Scott, N and Fowler, M. *Plant biotechnology* Oxford Univ. Press. 2003.	**Third component -Poster presentation** -Application of transgenic plants (Date of submission - February 06 and 07, 2017)
Feb.10 - 17, 2017 (Day Order 1 to 6) 5hrs.	**Animal Biotechnology** **Unit 2** 2.4 Biotechnology in Animal production – Manipulation of growth **Plant Biotechnology** **Unit 5** 5.3 Hybrid Seed Production	Lecture: Power point presentation Lecture: Power point presentation	Houdevine, Louis –Marie. Transgenic animals: Generation and use, USA: CRC.1997 Chawla, H.S. *Introduction to Plant Biotechnology***.** 3rd ed. Oxford and IBH Pub. 2009.	Viva voce Test – short answers
Feb. 20 - 27, 2017 (Day Order 1 to 6) 5hrs.	**Animal Biotechnology** **Unit 2** 2.5 Probiotics as Growth Promoters **Plant Biotechnology** **Unit 5** 5.4 QTL	Lecture: Power point presentation Lecture: Black board	Houdevine, Louis –Marie. Transgenic animals: Generation and use, USA: CRC.1997 Chawla, H.S. *Introduction to Plant Biotechnology***.** 3rd ed. Oxford and IBH Pub. 2009.	Quiz Group discussion
Feb. 28- Mar. 07, 2017 (Day Order 1 to 6) 5hrs.	**Animal Biotechnology** **Unit 2** 2.5 Manipulation of Lactation **Plant Biotechnology** **Unit 5** 5.4 Marker Assisted	Lecture: Power point presentation Lecture: Power point	Houdevine, Louis –Marie. Transgenic animals: Generation and use, USA: CRC.1997 Chawla, H.S. *Introduction to Plant Biotechnology***.**	Group discussion Quiz - oral

	Selection	presentation	3rd ed. Oxford and IBH Pub. 2009.	
Mar. 6 - 16, 2017	**C.A. IMPROVEMENT TESTS**			
Mar. 08 -15, 2017 (Day Order 1 to 6) 5hrs.	**Animal Biotechnology** **Unit 2** 2.5 Wool Production in Sheep **Plant Biotechnology** **Unit 5** 5.5 Applications of Tissue Culture in Agriculture and Horticulture.	Lecture: Power point presentation Lecture: Power point presentation	Houdevine, Louis –Marie. Transgenic animals: Generation and use, USA: CRC.1997 Purohit, S.S. *Agricultural Biotechnology*. Agrobios, India 2007.	Group discussion Group discussion
Mar. 16, 2017 (Day Order 1)	**Animal Biotechnology** **Unit 2** 2.5 Rumen Digestive System			Viva voce
Mar. 17-23, 2017 (Day Order 2 to 6)	**REVISION**			
Mar. 16, 2017 (Day Order 1)				

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

Course Schedule – November 2016- April 2017

Department : Biotechnology

Name/s of the Faculty : Dr. J. Anbumalarmathi and Dr. Aruna Sharmili, S.

Course Title : Biophysics and Bioinstrumentation

Course Code : 15BY/PE/BB14

Shift : II

Week & No. of hours	Units & Topics	Teaching Methodology	Text & References	Method of Evaluation
Nov. 14 – 19, 2016 (Day Order 1 to 6)	**Biophysics** **Unit 1** Bioenergetic Principles: Concept of Energy-Thermodynamic Principles –Free Energy-Enthalpy-Entropy-Role of High Energy Phosphates-Energy Transduction. **Bioinstrumentation** **Unit 3** Separation Techniques-Centrifugation - Basic Principles of Sedimentation.	Lecture: power point presentation Lecture: power point presentation	Vasantha Pattabhi and N. Gautham. *Biophysics*. India: Narosa, 2010. Wilson, K and Walker, J. *Practical Biochemistry – Principles and Techniques***.** U.S.A.: Cambridge, 2002. Morris and Morris. *Separation Methods in Biochemistry*. London: Pitman, 1960.	Test (short answers) Viva voce
Nov. 21 – 28, 2016 (Day Order 1 to 6)	**Biophysics** **Unit 1** Structure, Conformation and Structural Polymorphism of Biomolecules-Proteins Carbohydrates and Nucleic Acids. **Bioinstrumentation** **Unit 3** Types of Centrifuges and Rotors.	Lecture: power point presentation Lecture: power point presentation	Vasantha Pattabhi and N. Gautham. *Biophysics*. India: Narosa, 2010. Wilson, K and Walker, J. *Practical Biochemistry – Principles and Techniques***.** U.S.A.: Cambridge, 2002. Morris and Morris. *Separation Methods in Biochemistry*. London: Pitman, 1960.	Quiz - oral Viva voce

Nov. 29 – Dec 05, 2016 (Day Order 1 to 6)	**Biophysics** **Unit 1** Methods of Structural Elucidation of Biological Macromolecules- ^{13}C and ^{1}H NMR. **Bioinstrumentation** **Unit 3** Preparative Ultracentrifugation - Differential and Density Gradient.	Lecture: Black board Lecture: power point presentation	Vasantha Pattabhi and N. Gautham. *Biophysics*. India: Narosa, 2010. Wilson, K and Walker, J. *Practical Biochemistry – Principles and Techniques***.** U.S.A.: Cambridge, 2002. Morris and Morris. *Separation Methods in Biochemistry*. London: Pitman, 1960.	Test (short answers) Viva voce
Dec. 06 - 14, 2016 (Day Order 1 to 6)	**Biophysics** **Unit 1** X-ray Diffraction Measurement of Transmittance and Absorbance – Beer's and Lamberts Law, Colorimetry - Principle, Description of the Instrument and Techniques. **Bioinstrumentation** **Unit 3** Chromatography- General Principles and Definitions, Gel Filtration and Affinity Chromatography.	Lecture: power point presentation Lecture: power point presentation	Vasantha Pattabhi and N. Gautham. *Biophysics*. India: Narosa, 2010. Wilson, K and Walker, J. *Practical Biochemistry – Principles and Techniques***.** U.S.A.: Cambridge, 2002. Morris and Morris. *Separation Methods in Biochemistry*. London: Pitman, 1960.	Open book test Viva voce
Dec. 15 - 21, 2016 (Day Order 1 to 6)	**Biophysics** **Unit 1** Spectrophotometry - UV Visible and Raman Spectroscopy, CD- ORD, IR, Fluorescence, ESR. **Bioinstrumentation** **Unit 3** HPLC and FPLC.	Lecture: power point presentation Lecture: power point presentation	Vasantha Pattabhi and N. Gautham. *Biophysics*. India: Narosa, 2010. Wilson, K and Walker, J. *Practical Biochemistry – Principles and Techniques***.** U.S.A.: Cambridge, 2002.	**Third component -Assignment** Spectrophotometry and its applications (Date of submission –December 19, 2016) Viva voce

Jan. 03 - 09, 2017 (Day Order 1 to 6)	**Biophysics** **Unit 1** Plasma Emission Spectroscopy, Principle and Description of the Instrument- -MALDI-TOF. **Unit 2**Ramachandran Plot, Protein Sequencing **Bioinstrumentation** **Unit 3** Ion-Exchange Chromatography, Supercritical Chromatography.	Lecture: Black board Lecture: power point presentation	Vasantha Pattabhi and N. Gautham. *Biophysics*. India: Narosa, 2010. Wilson, K and Walker, J. *Practical Biochemistry – Principles and Techniques***.** U.S.A.: Cambridge, 2002. Morris and Morris. *Separation Methods in Biochemistry*. London: Pitman, 1960.	Quiz - oral **III Component Scrap book -** Techniques in chromatography (Date of submission – January 7, 2017)
Jan. 10 - 17, 2017 (Day Order 1 to 6)	**Biophysics** **Unit 2** Protein-Protein and Protein-Ligand Interactions. **Bioinstrumentation** **Unit 4** Radiation Biology- Stable and Radio-isotopes.	Lecture: power point presentation Lecture: power point presentation	Vasantha Pattabhi and N. Gautham. *Biophysics*. India: Narosa, 2010. Wilson, K and Walker, J. *Practical Biochemistry – Principles and Techniques***.** U.S.A.: Cambridge, 2002.	Test (short answers) Viva voce
Jan. 18 - 20, 2017 (Day Order 1 to 3)	**Biophysics** **Unit 2** Protein Folding- Glycoprotein and Lipoprotein, **Bioinstrumentation** **Unit 4** Measurement of Radioactivity in Biological Samples- Gas Ionization (GM counter), Scintillation Counter.	Lecture: power point presentation Lecture: power point presentation	Vasantha Pattabhi and N. Gautham. *Biophysics*. India: Narosa, 2010. Wilson, K and Walker, J. *Practical Biochemistry – Principles and Techniques***.** U.S.A.: Cambridge, 2002.	Group discussion Group discussion

Jan. 23-28, 2017	**C. A. Tests**			
Jan. 30 – Feb 01, 2017 (Day Order 4 to 6)	**Biophysics** **Unit 2** Membrane Biophysics- Structure and Dynamics of Biological Membranes. **Bioinstrumentation** **Unit 4** Radiation Units, Safety Aspects in Handling Radioactive Isotope.	Lecture: power point presentation Lecture: power point presentation	Vasantha Pattabhi and N. Gautham. *Biophysics*. India: Narosa, 2010. Wilson, K and Walker, J. *Practical Biochemistry – Principles and Techniques***.** U.S.A.: Cambridge, 2002.	Group discussion Group discussion
Feb 02 - 09, 2017 (Day Order 1 to 6)	**Biophysics** **Unit 2** Signal Transduction Across Membranes. **Bioinstrumentation** **Unit 4** Autoradiography and Dosimeter .	Lecture: power point presentation Lecture: power point presentation	Vasantha Pattabhi and N. Gautham. *Biophysics*. India: Narosa, 2010. Wilson, K and Walker, J. *Practical Biochemistry – Principles and Techniques***.** U.S.A.: Cambridge, 2002.	Test (short answers) Viva voce
Feb. 10 - 17, 2017 (Day Order 1 to 6)	**Biophysics** **Unit 2** Nernst Equation **Bioinstrumentation** **Unit 4** Application of Radioactive Isotopes in Biological Studies. **Unit 5** Electrophoresis - Basic Principles, SDS-PAGE, Isoelectric Focusing and 2 dimensional Gels.	Lecture: Black board Lecture: power point presentation	Vasantha Pattabhi and N. Gautham. *Biophysics*. India: Narosa, 2010. Wilson, K and Walker, J. *Practical Biochemistry – Principles and Techniques***.** U.S.A.: Cambridge, 2002.	Group discussion Group discussion
Feb. 20 - 27, 2017 (Day Order 1 to 6)	**Biophysics** **Unit 2** Membrane Potential- Biomechanics. **Bioinstrumentation** **Unit 5** Capillary Electrophoresis,	Lecture: power point presentation Lecture: power point	Vasantha Pattabhi and N. Gautham. *Biophysics*. India: Narosa, 2010. Wilson, K and Walker, J. *Practical Biochemistry – Principles and Techniques***.** U.S.A.:	Group discussion Group discussion

	Denaturing Agarose Gel Electrophoresis,	presentation	Cambridge, 2002.	
Feb. 28- Mar 07, 2017 (Day Order 1 and 6)	**Biophysics** **Unit 2** Neurobiophysics **Bioinstrumentation Unit 5** Pulse-field Gel Electrophoresis, Mobility Shift Electrophoresis.	Lecture: power point presentation	Vasantha Pattabhi and N. Gautham. *Biophysics*. India: Narosa, 2010. Wilson, K and Walker, J. *Practical Biochemistry – Principles and Techniques***.** U.S.A.: Cambridge, 2002.	Group discussion Viva voce
Mar. 6 - 16, 2017	**C.A. IMPROVEMENT TESTS**			
Mar. 08 - 15, 2017 (Day Order 1 to 6)	**Biophysics** **Unit 2** Macromolecular Interactions**-** Supramolecules **Bioinstrumentation Unit 5** Microscopy- Transmission and Scanning Electron Microscopy.	Lecture: power point presentation	Vasantha Pattabhi and N. Gautham. *Biophysics*. India: Narosa, 2010. Wilson, K and Walker, J. *Practical Biochemistry – Principles and Techniques***.** U.S.A.: Cambridge, 2002.	Group discussion Viva voce
Mar. 16, 2017 (Day Order 1)	**Bioinstrumentation Unit 5** Cryomicroscopy and Confocal Microscopy.	Lecture: power point presentation	Vasantha Pattabhi and N. Gautham. *Biophysics*. India: Narosa, 2010. Wilson, K and Walker, J. *Practical Biochemistry – Principles and Techniques***.** U.S.A.: Cambridge, 2002.	Group discussion
Mar. 17-23, 2017 (Day Order 2 to 6)	**REVISION**			
Mar.24, 2017				

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

Course Schedule – November 2015 – April 2016

Department : **BIOTECHNOLOGY**

Name/s of the Faculty : **DR. J. Anbumalarmathi**

Course Title : **APPLICATIONS OF BIOTECHNOLOGY**

Course Code : **15BY/PE/AB24**

Shift : **II**

Week & No. of hours	Units & Topics	Teaching Methodology	Text & References	Method of Evaluation
Nov. 14 - 19, 2016 (Day Order 1 to 6)	**Unit 1** **Fermentation Technology** 1.1 Fundamentals of Fermentation Technology: History of Fermentation Technology. Up Stream and Down Stream Processing	Lecture: Power point presentation	Palmer, Trevor.. *Enzymes : Biochemistry, Biotechnology and Clinical Chemistry***.** Horwood Publishing. 2004. Patel, A.H. *Industrial Microbiology.* MacMillan Publishers. 1999. Demain, Arnold L., and Davies, Julian E. *Manual of Industrial Microbiology and* *Biotechnology***.** 3rd ed., ASM Press. 2010.	Group discussion
Nov. 21 - 28, 2016 (Day Order 1 to 6)	**Unit 1** 1.2 Applications of Enzymes in the Food Industry - Cheese, Bread, Wine, Beer and Meat	Lecture: Power point presentation	Patel, A.H. *Industrial Microbiology.* MacMillan Publishers. 1999. Demain, Arnold L., and Davies, Julian E. *Manual of Industrial Microbiology and*	Test – short answers

			*Biotechnology***.** 3rd ed., ASM Press. 2010.	
Nov. 29 – Dec 5, 2016 (Day Order 1 to 6)	**Unit 1** 1.3 Enzyme and Antibiotic Production – Cellulase and Penicillin	Lecture: Power point presentation	Patel, A.H. Industrial Microbiology. MacMillan Publishers. 1999. Demain, Arnold L., and Davies, Julian E. Manual of Industrial Microbiology and Biotechnology. 3rd ed., ASM Press. 2010.	Quiz - oral
Dec 6 - 14, 2016 (Day Order 1 to 6)	**Unit 2** Bioactive Compounds and Bioproducts 2.1 Biofertilizers and Vermicomposting	Lecture: Power point presentation, visit to vermicompost unit in Stella Maris College	Patel, A.H. Industrial Microbiology. MacMillan Publishers. 1999. Demain, Arnold L., and Davies, Julian E. Manual of Industrial Microbiology and Biotechnology. 3rd ed., ASM Press. 2010.	Group discussion
Dec. 15 - 21, 2016 (Day Order 1 to 6)	**Unit 2** 2.2 Importance of VAM Fungi. Mushroom Cultivation. Food Value of Edible Mushrooms	Lecture: Power point presentation	Patel, A.H. Industrial Microbiology. MacMillan Publishers. 1999. Demain, Arnold L., and Davies, Julian E. Manual of Industrial Microbiology and Biotechnology. 3rd ed., ASM Press. 2010.	Group discussion
Jan. 03- 09, 2017 (Day Order 1 to 6)	**Unit 2** 2.3 Biofuels: Ethanol Production and	Lecture: Power point presentation	Patel, A.H. Industrial Microbiology. MacMillan Publishers. 1999.	Quiz - oral

	Biogas. Biodiesel. Petroplants and Algal Hydrocarbons		Demain, Arnold L., and Davies, Julian E. Manual of Industrial Microbiology and Biotechnology. 3rd ed., ASM Press. 2010.-do-	
Jan. 10- 17, 2017 (Day Order 1 to 6)	**Unit 4 Applications of Plant Tissue Culture** 4.1 Tissue Culture: Overview. Synthetic seeds 4.2 Applications in Agriculture (Herbal Products), Horticulture (Micropropagation), Floriculture (Ornamental Plants) and Pharmaceutical (Medical Compounds) Industry	Lecture: Power point presentation	Chawla, H.S.. Introduction to Plant Biotechnology. 3rd ed. Oxford and IBH Pub. 2009. Slater, A., Scott, N and Fowler, M.. Plant biotechnology Oxford Univ. Press. 2003. Purohit, S.S. Agricultural Biotechnology. Agrobios, India. . 2007.	**Third component- Assignment -** Application of plant tissue culture in floriculture and pharmaceutical company (Date of submission – January 16, 2017)
Jan. 18- 20, 2017 (Day Order 1 to 3)	**Unit 4** Applications in Agriculture (Herbal Products), Horticulture (Micropropagation), Floriculture (Ornamental Plants) and Pharmaceutical (Medical Compounds) Industry	Lecture: Power point presentation	Chawla, H.S.. Introduction to Plant Biotechnology. 3rd ed. Oxford and IBH Pub. 2009. Slater, A., Scott, N and Fowler, M.. Plant biotechnology Oxford Univ. Press. 2003. Purohit, S.S. Agricultural Biotechnology. Agrobios, India. . 2007.	Quiz -oral

Jan.23 - 28, 2017	**C.A. Tests**			
Jan.30 – Feb 01, 2017 (Day Order 4 to 6)	**Applications of Genetic Engineering** 3.1 Introduction to Cloning. Production of Transgenic Animals – Mouse, Fish, poultry and Other Mammals	Lecture: Power point presentation	Freshney, Ian R. *Culture of Animal Cells: A Manual of Basic Technique*, 6th ed., Wiley-Liss. 2010.	Debate – pros and cons of transgenic animals
Feb.02 - 09, 2017 (Day Order 1 to 6)	**Unit 3** 3.2 Cloning in Animals: Micromanipulation and Microinjection	Lecture: Power point presentation	Freshney, Ian R. *Culture of Animal Cells: A Manual of Basic Technique*, 6th ed., Wiley-Liss. 2010.	Quiz - oral
Feb.10 - 17, 2017 (Day Order 1 to 6)	**Unit 3** 3.3 Transgenic Plants for Crop Improvement: Herbicide and Insect Resistance	Lecture: Power point presentation	Chawla, H.S.. Introduction to Plant Biotechnology. 3rd ed. Oxford and IBH Pub. 2009. Purohit, S.S and Mathur S.K..Biotechnology – Fundamentals and Applications, 3rd edn. Agrobios, India. 2000.	Debate – pros and cons of transgenic plants
Feb.20 - 27, 2017 (Day Order 1 to 6)	**Unit 5** 5.1 DNA Fingerprinting in Forensic Science	Lecture: Power point presentation	Chawla, H.S.. Introduction to Plant Biotechnology. 3rd ed. Oxford and IBH Pub. 2009. Purohit, S.S and	Open book test

			Mathur S.K..Biotechnology – Fundamentals and Applications, 3rd edn. Agrobios, India. 2000.	
Feb.28 – Mar 07, 2017 (Day Order 1 to 6)	**Unit 5** 5.2 Application of Vaccines	Lecture: Power point presentation	Glick, B.R., and Pasternak, J.J.. Molecular Biotechnology – Principles and Applications of Recombinant DNA, Panima Publishing Corporation, New Delhi. 1994.	**Third component** – s**eminar** presentation on applications of vaccines (Date of submission – February 28, March 1, 2017)
Mar. 6 - 16, 2017	**C.A. IMPROVEMENT TESTS**			
Mar. 08 - 15, 2017 (Day Order 1 to 6)	**Unit 5** 5.3 Application of Biosensors	Lecture: Power point presentation	Glick, B.R., and Pasternak, J.J.. Molecular Biotechnology – Principles and Applications of Recombinant DNA, Panima Publishing Corporation, New Delhi. 1994.	Group discussion
Mar. 16, 2017 (Day Order 1)	**Unit 5** 5.4 Screening Tests for Genetic Diseases	Lecture: Power point presentation	Glick, B.R., and Pasternak, J.J.. Molecular Biotechnology – Principles and	Test - oral

			Applications of Recombinant DNA, Panima Publishing Corporation, New Delhi. 1994.	
Mar. 17 - 23, 2017 (Day Order 2 to 6)	**REVISION**			
March 24, 2017				

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

Course Schedule – November 2016 – April 2017

Department : **Biotechnology**

Name/s of the Faculty : **Dr. Aruna Sharmili. S**

Course Title : **Stem Cell Biology and Tissue Engineering**

Course Code : **15BY/PC/ST44**

Shift : **II**

Week & No. of hours	Units & Topics	Teaching Methodology	Text & References	Method of Evaluation
Nov. 14 - 19, 2016 (Day Order 1 to 6) 5hrs.	**Unit 1** **Introduction to Stem Cells** 1.1 Stem Cells - Definition, Characterization, Pluripotency, Self-renewal and Differentiation 1.2 Pluripotent Stem Cells from Vertebrate Embryos	Lecture: Power point presentation	Robert Lanza. *Essentials of Stem Cell Biology.* U.S.A.: Academic, 2005. Atala, Anthony. *Principles of Regenerative Medicine***.** U.S.A.: Academic, 2008.	Group discussion
Nov. 21 - 28, 2016 (Day Order 1 to 6) 5hrs.	**Unit 1** Stem Cell Niches - Niche Specification within Mammalian Tissues	Lecture: Power point presentation	Robert Lanza. *Essentials of Stem Cell Biology.* U.S.A.: Academic, 2005. Atala, Anthony. *Principles of Regenerative Medicine***.** U.S.A.: Academic, 2008.	Viva voce
Nov. 29 – Dec 5, 2016 (Day Order 1 to 6) 5hrs.	**Unit 1** 1.4 Adult Stem Cell from Amniotic Fluid- Cord Blood and Tooth Primordial	Lecture: Power point presentation	Robert Lanza. *Essentials of Stem Cell Biology.* U.S.A.: Academic, 2005. Atala, Anthony. *Principles of Regenerative Medicine***.** U.S.A.: Academic, 2008.	Viva voce
Dec 6 - 14, 2016 (Day Order 1 to 6)	**Unit 2** **Basic Mechanism of**	Lecture: Power point	Robert Lanza. *Essentials of Stem Cell Biology.* U.S.A.:	Viva voce

5hrs.	**Stem Cells** 2.1 Basic Biology, Mechanism of Stem Cells, Molecular Basis of Pluripotency- Influence of the IL6 Family of Cytokines	presentation	Academic, 2005. Atala, Anthony. *Principles of Regenerative Medicine***.** U.S.A.: Academic, 2008.	
Dec. 15-21, 2016 (Day Order 1 to 6) 5hrs.	**Unit 2** 2.2 Extrinsic Determinants and Intrinsic Determinants of Pluripotency	Lecture: Power point presentation	Robert Lanza. *Essentials of Stem Cell Biology.* U.S.A.: Academic, 2005. Atala, Anthony. *Principles of Regenerative Medicine***.** U.S.A.: Academic, 2008.	Viva voce
Jan. 03-09, 2017 (Day Order 2 to 6) 5hrs.	**Unit 2** 2.3 Epigenetic Configuration of Pluripotent Cells	Lecture: Power point presentation	Robert Lanza. *Essentials of Stem Cell Biology.* U.S.A.: Academic, 2005. Atala, Anthony. *Principles of Regenerative Medicine***.** U.S.A.: Academic, 2008.	Group discussion
Jan.10 - 17, 2017 (Day Order 1 to 6) 5hrs.	**Unit 2** 2.4 Mechanism of Stem Cell Renewal	Lecture: Power point presentation	Robert Lanza. *Essentials of Stem Cell Biology.* U.S.A.: Academic, 2005. Atala, Anthony. *Principles of Regenerative Medicine***.** U.S.A.: Academic, 2008.	Group discussion
Jan.18 - 25, 2016 (Day Order 1 to 6) 5hrs.	**Unit 3** **Applications of Stem Cells** 3.1 Stem Cell Gene Therapy, Cancer Stem Cells 3.2 Neural Stem Cells for Central Nervous System Repair-Spinal Cord Injury	Lecture: Power point presentation	Robert Lanza. *Essentials of Stem Cell Biology.* U.S.A.: Academic, 2005. Atala, Anthony. *Principles of Regenerative Medicine***.** U.S.A.: Academic, 2008.	Viva voce

Jan.18 – 20, 2017 (Day Order 1 to 3) 2hrs.	**Unit 3** 3.3 Use of Embryonic Stem Cells to Treat Heart Disease	Lecture: Power point presentation	Robert Lanza. *Essentials of Stem Cell Biology.* U.S.A.: Academic, 2005. Atala, Anthony. *Principles of Regenerative Medicine***.** U.S.A.: Academic, 2008.	**III component-Assignment-** Embryonic Stem Cells to Treat Heart Disease (Date of submission – January 18,2017)
Jan.23 - 28, 2017	**C.A. Tests**			
Jan.30 – Feb. 01, 2017 (Day Order 4 to 6) 3hrs.	**Unit 3** 3.4 Insulin-Producing Cells Derived from Embryonic Stem Cells 3.5 Stem Cells for Burns and Skin Ulcers	Lecture: Power point presentation	Robert Lanza. *Essentials of Stem Cell Biology.* U.S.A.: Academic, 2005. Atala, Anthony. *Principles of Regenerative Medicine***.** U.S.A.: Academic, 2008.	Viva voce
Feb.02 - 09, 2017 (Day Order 1 to 6) 5hrs.	**Unit 3** 3.6 Orthopedic Applications of Stem Cells **Unit 4** **Introduction to Tissue Engineering** 4.1 Tissue Engineering- Basic Biology of Tissue Engineering- the Basis of Growth and Differentiation, Morphogenesis and Tissue Engineering	Lecture: Power point presentation	Robert P. Lanaza, Robert Langer and Joseph Vacanti. *Principles of Tissue Engineering*. U.S.A.: Academic, 2007.	Viva voce
Feb.10 - 17, 2017 (Day Order 1 to 6) 5hrs.	**Unit 4** 4.2 *In vitro* Control of Tissue Development 4.3 Growth Factors, Tissue Engineering Bioreactors 4.4 Tissue Assembly in Microgravity	Lecture: Power point presentation	Robert P. Lanaza, Robert Langer and Joseph Vacanti. *Principles of Tissue Engineering*. U.S.A.: Academic, 2007.	Viva voce

Feb. 20 - 27, 2017 (Day Order 1 to 6) 5hrs.	**Unit 4** 4.5 Biomaterials in Tissue Engineering **Unit 5** Applications of Tissue Engineering 5.1 Bioartificial Organs– Bioartificial Pancreas, Hepat Assist Liver Support System	Lecture: Power point presentation	Robert P. Lanaza, Robert Langer and Joseph Vacanti. *Principles of Tissue Engineering*. U.S.A.: Academic, 2007.	**Quiz - oral** **III component - Scrap book-** Bioartificial Organs (Date of submission – February 20,2017)
Feb. 28- Mar. 07, 2017 (Day Order 1 to 6) 5hrs.	**Unit 5** 5.2 Heamatopoietic System- Red Blood Cell Substitutes-Renal Replacement Devices 5.3 Brain Implants-Neural Stem Cells	Lecture: Power point presentation	Robert P. Lanaza, Robert Langer and Joseph Vacanti. *Principles of Tissue Engineering*. U.S.A.: Academic, 2007.	Group discussion
Mar. 6 - 16, 2017	**C.A. IMPROVEMENT TESTS**			
Mar. 08 -15, 2017 (Day Order 1 to 6) 5hrs.	**Unit 5** 5.4 Periodontal Applications, Artificial Womb	Lecture: Power point presentation	Robert P. Lanaza, Robert Langer and Joseph Vacanti. *Principles of Tissue Engineering*. U.S.A.: Academic, 2007.	Group discussion
Mar. 16, 2017 (Day Order 1)	5.5 Future Perspectives of Tissue Engineering	Group discussion	Robert P. Lanaza, Robert Langer and Joseph Vacanti. *Principles of Tissue Engineering*. U.S.A.: Academic, 2007.	Group discussion
Mar. 17-23, 2017 (Day Order 2 to 6)	**REVISION**			
Mar. 24, 2017 (Day Order 1)				

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

Course Schedule – November 2016 – April 2017

Department : **Biotechnology**

Name/s of the Faculty : **Dr.Anbumalarmathi and Dr.K.Veena Gayathri**

Course Title : **FOOD AND PHARMACEUTICAL BIOTECHNOLOGY**

Course Code : **15BY/PC/FP44**

Shift : **II**

Week & No. of hours	Units & Topics	Teaching Methodology	Text & References	Method of Evaluation
Nov. 14 - 19, 2016 (Day Order 1 to 6)	**Food Biotechnology** **Unit 1** Source of Food - Food of Plant, Animal and Microbial Origin **Unit 3** Food Borne Infections and Intoxications, Infective and Toxic types Types – *Clostridium sp., Salmonella sp.*, *Shigella sp.*,	Lecture :Power point presentation Lecture :Power point presentation	Joshi, V. K, Pandey. A Biotechnology: Food fermentation microbiology, biochemistry and technology. India: Educational, 1999. Adams, M. R. Moss, M. O. Food Microbiology, U.S.A.: Royal Society of Chemistry	Quiz - oral Short Answers Test
Nov. 21 - 28, 2016 (Day Order 1 to 6)	**Food Biotechnology** **Unit 1** Different Foods and Groups of Foods as Raw Materials for Processing, Need and Significance of Processing these Foods. **Unit 3** Food Borne Infections *Staphylococcus sp.*, *Campylobacter sp.*, *Listeria sp.*	Lecture :Power point presentation Lecture :Power point presentation	Joshi, V. K, Pandey. A Biotechnology: Food fermentation microbiology, biochemistry and technology. India: Educational, 1999. Katzung, B. G. Masters, S. B., Trevor, A. J. *Basic and* *Clinical*	Group discussion **III Component On Food Borne infections**

			Pharmacology. U.S.A.: McGraw, 2012.	
Nov. 29 – Dec 5, 2016 (Day Order 1 to 6)	**Food Biotechnology** **Unit 1** Milling of Grains and Pulses, Edible Oil Extraction **Pharmaceutical biotechnology** **Unit 4** **General Pharmacology** Introduction of Pharmacology, Sources of Drugs, Route of Administration, Mechanism of Action of Drugs- Absorption, Distribution, Metabolism and Excretion of Drugs	Lecture: Black Board Lecture: Black Board	Joshi, V. K, Pandey. A Biotechnology: Food fermentation microbiology, biochemistry and technology. India: Educational, 1999. Tripathi K D. *Essentials of Medical Pharmacology*.	Quiz - oral **III Component Essay type Test**
Dec 6 - 14, 2016 (Day Order 1 to 6)	**Food Biotechnology** **Unit 1** Pasteurisation of Milk and Yoghurt, Canning and Bottling **Pharmaceutical biotechnology** General Pharmacology Metabolism and Excretion of Drugs	Lecture :Power point presentation Lecture: Black Board	Doyle, M. P., Buchanan, R. L. *Food Microbiology: Fundamentals and Frontiers*. U.S.A. ASM, 2012. Tripathi K D. Essentials of Medical Pharmacology.	Group discussion Group Discussion
Dec. 15 - 21, 2016 (Day Order 1 to	**Food Biotechnology** **Unit 1** Drying – Traditional and Modern Methods of	Lecture: Black Board	Joshi, V. K, Pandey. A Biotechnology: Food fermentation	Test – short answers

6)	Drying, Dehydration of Fruits, Vegetables, Milk, Animal Products etc. **Pharmaceutical biotechnology** General Pharmacology Absorption, Distribution, Metabolism and Excretion of Drugs		microbiology, biochemistry and technology. India: Educational, 1999. Tripathi K D. Essentials of Medical Pharmacology.	Short Answers Test
Jan. 03- 09, 2017 (Day Order 1 to 6)	**Food Biotechnology Unit 1** Preservation by Use of Acid, Sugar and Salt **Pharmaceutical biotechnology Unit 4** Pharmacological Classification of Drugs - Analgesics, Antipyretics, Anti-inflammatory,	Lecture : Power point presentation Lecture : Power point presentation	Joshi, V. K, Pandey. A Biotechnology: Food fermentation microbiology, biochemistry and technology. India: Educational, 1999. Tripathi K D. Essentials of Medical Pharmacology.	**Third component – Poster presentation -** food preservation and packaging methods (Date of submission – January 4 -6, 2017)
Jan. 10- 17, 2017 (Day Order 1 to 6)	**Food Biotechnology Unit 1** Pickling and Curing with Microorganisms and Microbial Fermentation, Frying, Baking, Extrusion Cooking **Pharmaceutical biotechnology Unit 4** Antidepressants and CNS Stimulants, Anti-hypertensive Drugs	Lecture : Power point presentation Lecture : Power point presentation	Joshi, V. K, Pandey. A Biotechnoogy: Food fermentation microbiology, biochemistry and technology. India: Educationa, 1999. Satoskar, R. S., Bhandarkar, S.D., Rege, N. Pharmacology and Pharmacotherapeutics	Quiz -oral **Assignment on Antidepressants III Component**

Jan. 18- 20, 2017 (Day Order 1 to 3)	**Food Biotechnology** **Unit 2** Food Preservation-Principles of Food Preservation **Pharmaceutical biotechnology** **Unit 4** Anti-hyper lipidemic Drugs. Diuretics and Anti-diuretics, Anti-asthmatic Drugs	Lecture : Power point presentation	Garbutt, J. *Essentials of Food Microbiology*, U.S.A.: Hodder, 1997. Satoskar, R. S., Bhandarkar, S.D., Rege, N. Pharmacology and Pharmacotherapeutics	Group discussion Group Discussion
Jan.23 - 28, 2017	**C.A. Tests**			
Jan.30 – Feb 01, 2017 (Day Order 4 to 6)	**Food Biotechnology** **Unit 2** Use of Chemical Preservatives, Canning, Freezing and Dehydration, Use of Radiation **Pharmaceutical biotechnology** **Unit 5** **Formulation and Delivery** Compressed Tablets-Wet Granulation –	Lecture :Power point presentation	Garbutt, J. *Essentials of Food Microbiology*, U.S.A.: Hodder, 1997. Satoskar, R. S., Bhandarkar, S.D., Rege, N. *Pharmacology and Pharmacotherapeutics*	Quiz -oral **III Component Scrap Book: Tablet Manufacturing**
Feb.02 - 09, 2017 (Day Order 1 to 6)	**Food Biotechnology** **Unit 2** Chemical and Physical Properties of Food Affecting Microbial Growth – pH, Water Activity, Redox Potential, Nutrients, Antimicrobial Compounds **Pharmaceutical**	Lecture :Power point presentation	Garbutt, J. *Essentials of Food Microbiology*, U.S.A.: Hodder, 1997. George, B. J. *Basic Food Microbiology.* U.S.A.: Springer, 1989. Satoskar, R. S.,	Group discussion **III Component**

	biotechnology **Unit 5** Formulation and Delivery Dry Granulation or Slugging-Direct Compression-Tablet Press		Bhandarkar, S.D., Rege, N. *Pharmacology and Pharmacotherapeutics*	**Seminar**
Feb.10 - 17, 2017 (Day Order 1 to 6)	**Food Biotechnology** **Unit 2** Role of Microorganisms in Food Spoilage **Pharmaceutical biotechnology** **Unit 5** Formulation-Coating-Capsules Sustained Dosage Forms-Parental Solutions	Lecture :Power point presentation	Adams, M. R. Moss, M. O. *Food Microbiology*, U.S.A.: Royal Society of Chemistry, 2000. Doyle, M. P., **Satoskar, R. S., Bhandarkar, S.D., Rege, N.** ***Pharmacology and Pharmacotherapeutics***	Test – short answers
Feb.20 - 27, 2017 (Day Order 1 to 6)	**Food Biotechnology** **Unit 3** Basic Packaging Materials, Types of Packaging, Packaging Design, Packaging for Different types of Foods, Retort Pouch Packing, Costs of Packaging and Recycling of Materials **Pharmaceutical biotechnology** **Unit 5** Injections-Ointments-Standard of Hygiene and Good Manufacturing Practices	Lecture :Power point presentation	Adams, M. R. Moss, M. O. *Food Microbiology*, U.S.A.: Royal Society of Chemistry, 2000. Doyle, M. P., Buchanan, R. L. *Food Microbiology: Fundamentals and Frontiers*. U.S.A. ASM, 2012. Satoskar, R. S., Bhandarkar, S.D., Rege, N. *Pharmacology and Pharmacotherapeutics*	Group discussion News Paper Report
Feb.28 – Mar 07, 2017	**Food Biotechnology** **Unit 3** Mycotoxins in Food with	Lecture : Power point	Adams, M. R. Moss, M. O. *Food Microbiology*, U.S.A.: Royal Society of	Group Discussion

(Day Order 1 to 6)	Reference to *Aspergillus* species **Pharmaceutical biotechnology** **Unit 5** Transdermal Delivery System, Liposomes and Nanoparticles	presentation	Chemistry, 2000. Doyle, M. P., Buchanan, R. L. *Food Microbiology: Fundamentals and Frontiers*. U.S.A. ASM, 2012. Satoskar, R. S., Bhandarkar, S.D., Rege, N. *Pharmacology and Pharmacotherapeutics*	
Mar. 6 - 16, 2017	**C.A. IMPROVEMENT TESTS**			
Mar. 08 - 15, 2017 (Day Order 1 to 6)	**Food Biotechnology** **Unit 3** Quality Assurance, Microbiological Quality Standards of Food, Government Regulatory Practices and Policies, FDA, EPA, HACCP, ISI, ISO, Genetically Modified Foods Classification of additives, E-number **Pharmaceutical biotechnology** **Unit 5** Personalized Medicine Pharmacogenomics	Lecture : Power point presentation	Adams, M. R. Moss, M. O. *Food Microbiology*, U.S.A.: Royal Society of Chemistry, 2000. Doyle, M. P., Buchanan, R. L. *Food Microbiology: Fundamentals and Frontiers*. U.S.A. ASM, 2012. Satoskar, R. S., Bhandarkar, S.D., Rege, N. *Pharmacology and Pharmacotherapeutics*	Group discussion Test on Personalized Medicine
Mar. 16, 2017 (Day Order 1)	**Unit 3** Biosensors in Food	Lecture : Power point presentation	Adams, M. R. Moss, M. O. *Food Microbiology*, U.S.A.: Royal Society of Chemistry, 2000. Doyle, M. P., Buchanan, R. L. *Food Microbiology: Fundamentals and Frontiers*. U.S.A. ASM, 2012.	Debate

Mar. 17 - 23, 2017 (Day Order 2 to 6)	**REVISION**
March 24, 2017 (Day Order 1)	

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

Course Schedule – November 2016 – April 2017

Department : Biotechnology

Name of the Faculty : Dr.K.Veena Gayathri

Course Title : Environmental Biotechnology

Course Code : 15BY/PE/ET14

Shift : II

Week & No. of hours	Units & Topics	Teaching Methodology	Text & References	Method of Evaluation
Nov. 14 - 19, 2016 (Day Order 1 to 6)	**Unit 1** **Introduction to Environment** Microbial Flora of Soil, Ecological Adaptations, Interactions among Soil Microorganisms, Biogeochemical Role of Soil Microorganisms.	Lecture –power point presentation	Thankur, I.S.. Environmental biotechnology – Basic concepts and applications	Group Discussion On ecological Diversity
Nov. 21 - 28, 2016 (Day Order 1 to 6)	Biodegradation, Microbiology of Degradation and its Mechanism, Bioaugmentation	Lecture –power point presentation	Thankur, I.S.. Environmental biotechnology – Basic concepts and applications	Group Discussion
Nov. 29 – Dec 5, 2016 (Day Order 1 to 6)	Biosorption, Bioleaching, Bioremediation- Types of Bioremediation, Bioreactors for Bioremediation, Metabolic	Lecture –power point presentation	Thankur, I.S.. Environmental biotechnology – Basic concepts and applications	**III Component Assignment** Pathways for Biodegradation for Specific Organic Pollutants
Dec 6 - 14, 2016 (Day Order 1 to 6)	**Unit -2** **Types of Pollution** Pollution- Sources of Pollutants for Air, Water (ground water, marine), Noise, Land and its Characteristics- Pollution Control and Management- Environmental Monitoring and Sampling	Lecture –power point presentation	Thankur, I.S.. Environmental biotechnology – Basic concepts and applications	Debate

Dec. 15 - 21, 2016 (Day Order 1 to 6)	Physical, Chemical and Biological Methods and Analysis- Air Pollution-Control and Treatment Strategies	Lecture –power point presentation	Mohapatra P.K. *Textbook of Environmental Biotechnology*. New Delhi: I.K. International, 2007.	Essay type Answers
Jan. 03- 09, 2017 (Day Order 1 to 6)	Modes of Biological Treatment Methods for Wastewater-Aerobic Digestion, Anaerobic Digestion, Anoxic Digestion, the Activated Sludge Process	Lecture –power point presentation	Metcalf and Eddy. *Waste water Engineering Treatment, Disposal and Reuse*. U.S.A.: Mc Graw, 1991.	**Test**
Jan. 10- 17, 2017 (Day Order 1 to 6)	Design and Modeling of Activated Sludge Processes, Design of a Trickling Biological Filter, Design of Anaerobic Digester	Lecture –power point presentation	Metcalf and Eddy. *Waste water Engineering Treatment, Disposal and Reuse*. U.S.A.: Mc Graw, 1991.	**III Component Seminar Presentation**
Jan. 18- 20, 2017 (Day Order 1 to 3)	**Unit 3** **Industrial Waste Management** Industrial Waste Management-Dairy, Paper and Pulp Textile, Leather, Hospital and Pharmaceutical	Lecture –power point presentation	Metcalf and Eddy. *Waste water Engineering Treatment, Disposal and Reuse*. U.S.A.: Mc Graw, 1991.	**III Component Seminar Presentation**
Jan.23 - 28, 2017	**C.A. Tests**			

Jan.30 – Feb 01, 2017 (Day Order 4 to 6)	**Unit 4** Molecular Biology Tools for Environmental Management, rDNA Technology in Waste Treatment, Genetically Modified Organisms in Waste Management	Lecture –power point presentation	Metcalf and Eddy. *Waste water Engineering Treatment, Disposal and Reuse***.** U.S.A.: Mc Graw, 1991.	Short answers Test
Feb.02 - 09, 2017 (Day Order 1 to 6)	**Unit 4** Genetic Sensors, Metagenomics, Bioprospecting, Nanoscience in Environmental Management, Phytoremediation for Heavy Metal Pollution, Biosensors Development to Monitor Pollution	Lecture –power point presentation	Metcalf and Eddy. *Waste water Engineering Treatment, Disposal and Reuse***.** U.S.A.: Mc Graw, 1991.	Long answers Test
Feb.10 - 17, 2017 (Day Order 1 to 6)	**Unit 5** Alternate Source of Energy, Biomass as a Source of Energy, Biocomposting, Vermiculture,Biofertilizers, Organic farming, Biofuels	Lecture –power point presentation	Metcalf and Eddy. *Waste water Engineering Treatment, Disposal and Reuse***.** U.S.A.: Mc Graw, 1991.	Short answers Test
Feb.20 - 27, 2017 (Day Order 1 to 6)	Biomineralization, Bioethanol and Fuel Cell	Lecture –power point presentation	Metcalf and Eddy. *Waste water Engineering Treatment, Disposal and Reuse***.** U.S.A.: Mc Graw, 1991	**III Component Assignment Biomineralization, Bioethanol**
Feb.28 – Mar 07, 2017 (Day Order 1 to 6)	Biohydrogen, Bioelectricity through Microbial	Lecture –power point presentation	Metcalf and Eddy. *Waste water Engineering*	Long answers Test

			*Treatment, Disposal and Reuse***.** U.S.A.: Mc Graw, 1991.	
Mar. 6 - 16, 2017	**C.A. IMPROVEMENT TESTS**			
Mar. 08 - 15, 2017 (Day Order 1 to 6)	Energy Management and Safety	Lecture –power point presentation	Metcalf and Eddy. *Waste water Engineering Treatment, Disposal and Reuse***.** U.S.A.: Mc Graw, 1991.	Short Answers Test
Mar. 16, 2017 (Day Order 1)	Energy Management and Safety	Lecture –power point presentation	Metcalf and Eddy. *Waste water Engineering Treatment, Disposal and Reuse***.** U.S.A.: Mc Graw, 1991.	Group Discussion
Mar. 17 - 23, 2017 (Day Order 2 to 6)	**REVISION**			
March 24, 2017 (Day Order 1)				