# Devi Ahilya Vishwavidyalaya Indore (M.P.)

Department of Higher Education, Govt. of M.P.
Post Graduate Semester wise Syllabus
As recommended and Approved by Board of Studies D.A.V.V.
उच्च शिक्षा विभाग, म.प्र. शासन
स्नातकोत्तर कक्षाओं के लिये सेमेस्टर अनुसार पाठ्यक्रम
अध्ययन मण्डल देवी अहिल्या विश्वविद्यालय द्वारा अनुशंसित तथा अनुमोदित
**Session (सत्र)** 2020-21

**M. Sc. Botany (Semester System)**
**Third Semester**

**Course PG 302: Biochemistry** **85+15**

UNIT I: **Fundamental Enzymology:** Nomenclature, Classification and characteristics of Enzymes, mechanism of enzyme action, Factors affecting enzymatic activities, cofactors, coenzyme, Allosteric mechanism, regulatory and active site, isoenzymes. Michalis Menton equation and its significance. Inhibition of enzymes - competitive, noncompetitive and mixed inhibition.

UNIT II: **Photochemistry and photosynthesis:** General concept, evolution of photosynthetic apparatus, Photosynthetic pigments and photo-system, Photo-oxidation of water, mechanism of electron and proton transport. Carbon assimilation - Calvin cycle, photorespiration and its significance, C4 cycle. Factors affecting photosynthesis.

UNIT III: **Respiration:** General Concept, Overview of plant respiration, Glycolysis, TCA cycle, Electron transport system and ATP synthesis, Oxidative phosphorelation, Pentose phosphate Pathway. Glyoxalate cycle, Structure and function of ATP.

UNIT IV: **Lipid and Sulphate Metabolism:** Structure and function of lipids, synthesis of membrane lipid, structural and storage lipids; Fatty acid biosynthesis and oxidation(Ketone bodies), Sulphate uptake, transport and assimilation.

UNIT V: **Nitrogen Metabolism:** Nitrogen uptake and Nitrogen metabolism over view, Nitrogen fixation mechanism, Nodule formation; Ammonium assimilation.

06.3.19

**Suggested Laboratory Exercise based on P.G. 302.**

1. Effect of time and enzyme concentration on the rate of reaction of enzyme C e.g. acid phosphate, nitrate reductase.

2. Effect of substrate concentration on activity of any enzyme C (catalase, amylase).

3 Demonstration of the substrate inducibility of the enzyme nitrate reductase.

4. Determination of succinate dehydrogenase activity, its kinetics and sensitivity to inhibitors.

5. Separation of isoenzyme of esterase, peroxidases by native polyacrelamide gel electrophoresis.

6. To demonstrate photophosphorylation in intact chloroplast, resolve the phosphoproteins by SDS-PAGE and perform autoradiography desalting of proteins by gel filtration chromatography embaying Sephadex G-25.

7. Extraction of seed proteins depending upon the solubility.

8. Desalting of proteins by gel filtration chromatography employing Sephadex G-25.

9. Preparation of standard curve of protein and estimation of protein contents in extracts of plant material by Lowry's Bradford's method.

10. Fraction of proteins using gel filtration chromatography by Sephadex G-100 or Sephadex G-200.

**Suggested readings-**


1. Moore, T.C.1989. Biochemistry and Physiology of Plant harmones (2ed.). Sp [ringer-Verlag, New York USA.

2. Buchanan, B.B.grulssem, W. and jones, R.L.2000. Biochemistry and Molecular Biology of Plants. American society of plants physiologists, Maryland USA

3. Dennis, D.T. and Terpin, D.H. Lefevere DD and Layzell D.V. 1997. Plant Metabolism.2ed. Longman England.

4. Lodish,H., Berk,A., Zipursky,S.L., Matsudaira,P., Baltimore,D. and Darnell, J.2000.Molecular cell biology (4th edition). W.H.,Freeman and Company, New York USA.

5. Nobel,P.S.1999.Physiochemical and environmental plant physiology(2ed) Academic press, San Diego, USA

6. Salisbury. F.,B., and Ross, C.W .1991. Plant physiology 4th edition. Wdswort Publishing CO. California USA.

7. Taiz,I. and Zeiger,E.1998. Plant Physiology(2nd. Ed.).Sinauer AssociatesInc.Publisher MS.

8. Buchanan,B.B.grulssem,W. and jones,R.L.2000. Biochemistry and Molecular Biology of Plants. American society of plants physiologists, Maryland USA.


6/3/19