2.12.1 BCM 2344: BIOCHEMISTRY OF SPECIALIZED TISSUES

Pre-requisites: BCM 1341; BCM 1342
Credit Units: 4.5

2.12.2 Purpose of the course;

To teach the student the nature of biological forms, the mechanisms of life and the mechanisms of life processes in terms of chemistry and biology of certain specialized tissues of the body.

2.12.3 Expected Learning Outcomes of the Course;

At the end of the course, the student should be able to:

1. List and Explain the mechanisms of function of specialized tissues,
2. List and Explain the involvement of organelles in disease causation,
3. Discuss the significance of acid-base balance,
4. Explain the bases of clinical biochemistry,
5. Perform some biochemical analyses and
6. To use this knowledge in the diagnosis of diseases

2.12.4 Course Content

Biochemistry of Specialized Tissues: Liver, Muscles, Adipose, Brain, Red blood cell, Special Topics; concept of cell organization as relevant to clinical diagnosis, intercellular organelles, nucleus, nucleolus, golgisomes, lysosomes, endoplasmic reticulum and cell membrane, mitochondria morphology and biochemical function: involvement of these organelles in disease **Clinical biochemistry**; function tests (liver, renal, gastric), urinalysis, water & electrolyte balance, acid-base balance. Use of biochemical parameters for diagnosis of various diseases. Isoenzymes and clinical applications. Drug Transport and metabolism; biotransformation pathways of drugs. **Practicals:** Structures and functions of cells through direct observation and experimentation. Protein sorting, organelles and membrane trafficking, cytoskeletal dynamics, and cell division. **Demonstration** of separation and purification of cell types, measurement of cell turnover and growth, cytotoxicity assays, preparation of microspheres, determination of protein stability.

2.12.5 Mode of Delivery;

Lectures, power point presentations, and class discussions. These will take a participatory approach. **Laboratory learning and Experiments:** The lecturer, together with the laboratory technical staff, will take the students through practical sessions, beginning with **demonstrations**. The students will thereafter be expected to use pre formulated laboratory manuals to carry out various practical exercises then write out their findings in their laboratory workbooks. **Video demonstrations and/or CD-Roms** on Medical Biochemistry when available, after the relevant topic has been covered. **Assignment criteria:** Students will be given several individual or group research assignments on topics relevant to the course. These could include lectures, discovery learning, problem-based learning, experimental learning, group-based learning, independent studies and e-learning.

2.12.6 Instructional Materials and/or Equipment;

Lecture notes or power points for presentation; Tutorials; Video demonstrations; CD-Roms; Dissection kits; Microscopes; Text books; Practical Manuals, biochemical reagents; glassware; biochemical analytical equipment; biochemical charts.

2.12.7 Course Assessment;

Distribution of Marks

Continuous Assessment Tests /Quizzes (atleast 2 sit in)		20%
Oral examination/Term paper	10%	
Mid-Quarter Exam	20%	
Final Exam	25%	
Continuous Laboratory exercises	15%	
End semester Practical Exam	10%	
Total	**100%**	

Grading

90 - 100	A
87 - 89	A^-
84 - 86	B^+
80 - 83	B
77 - 79	B^-
74 - 76	C^+
70 - 73	C
67 - 69	C^-
64 - 66	D+
62 - 63	D
60 - 61	D-
00 - 59	F

2.12.8 Core Reading Materials for the Course

Nelson, D. L. & Cox, M. M. (2012). Lehninger Principles of Biochemistry. 6th Edition. W. H. Freeman & Co., New York

Ninfa, A. J., Ballou, D. P., Benore, M. (2009). Fundamental Laboratory Approaches for Biochemistry and Biotechnology. 2nd Edition. Wiley, Hoboken, NJ, USA

Reginald H. Garrett, R. H., Grisham, C. M. (2013). Biochemistry. 5th Edition. Books /Cole Cengage Learning, Belmont, CA

2.12.9 Recommended Reference Materials;

Cammack, R., Attwood, T., Campbell, P., Parish, H., Smith, A., Vella, F., and Stirling, J. (Eds). (2006). Oxford Dictionary of Biochemistry and Molecular Biology. 3rd Edition. Oxford University Press, Oxford

Chatterjea, M. N., Rana, S. (2012). Textbook of medical Biochemistry. 8th Edition. Jaypee Brothers Medical Publishers (P) Ltd., New Delhi

Jeremy, M. B., John L. T. and Lubert, S. (2002). Biochemistry. 5th Edition. W. H. Freeman & Co., New York

Meisenberg, G., Simmons, W. H. (2012). Principles of Medical Biochemistry. 3rd Edition. Saunders, Elsevier, Philadelphia

Robert, K. M., Daryl K. G., Mayes, P. A., Rodwell, V. W. (2009). Harper's Illustrated Biochemistry. 29th Edition. Lange Medical Books, New York