UNIVERSITI TEKNOLOGI MARA

BIO150: METABOLISM AND CELL DIVISION

Course Name (English)	METABOLISM AND CELL DIVISION APPROVED
Course Code	BIO150
MQF Credit	3
Course Description	This is a course in biology that introduces students to the concepts and principles of biology. Students will be introduced to the various fields of biology, which includes the study of enzymes, metabolism, cell respiration and cell division.
Transferable Skills	Demonstrate ability to identify and articulate self skills, knowledge and understanding confidently and in a variety of context.
Teaching Methodologies	Lectures, Blended Learning, Lab Work, Case Study, Presentation
CLO	CLO1 Explain the basic principle of biochemical processes and molecular mechanisms in living organisms. CLO2 Perform (plan, conduct and analyse) scientific investigations in areas of biochemical processes and cell division. CLO3 Demonstrate verbally and in writing the articulation of information and relevance of references related to biochemical processes and molecular mechanisms in living organisms.
Pre-Requisite Courses	No course recommendations

Topics
1. 1.0 Enzymes 1.1) The general characteristics of enzymes 1.2) The relationship between enzyme and activation energy 1.3) Enzyme specificity relating to Key and Lock Model 1.4) Enzyme specificity relating to Induced Fit Model 1.5) Factors affecting enzyme activities (Enzyme concentration, substrate concentration, temperature,pH) 1.6) Inhibition [Basic principle of enzyme inhibition (competitive versus non-competitive; 1.7) reversible versus irreversible), One example of competitive and non-competitive inhibition,One example of reversible and irreversible enzyme inhibition] 1.8) Allosteric regulation (definition, activator and inhibitor) 1.9) Enzyme Classification (6 classes) [Oxidoreductase, Transferase, Isomerase, Hydrolase, Lyase, Lygase]
2. 2.0 Cellular respiration 2.1) Structure and significance of ATP [Metabolisme (Anabolism and Catabolism)] 2.2) Cellular respiration as an oxidation-reduction process 2.3) Aerobic respiration (Glycolysis, Krebs cycle, ETC, oxidative phosphorylation) 2.4) Anaerobic respiration (Alcoholic fermentation,Lactic acid fermentation)
3. 3.0 Photosynthesis 3.1) Autotrophs 3.2) Photosynthetic pigments (Chlorophylls, Caratenoids, Absorption spectrum) 3.3) Light reactions (Photosystem I and Photosystem II, Cyclic and non-cyclic photophosphorylation) 3.4) Dark reactions/ Calvin cycle 3.5) C3, C4 and CAM plants
4. 4.0 Cell division 4.1) Mitosis 4.2) Meiosis 4.3) Central Dogma 4.4) DNA replication (Conservative, semi-conservative and dispersive models) 4.5) Protein synthesis (mRNA, tRNA, rRNA, Genetic code, Transcription, Translation)

Assessment Breakdown	%
Continuous Assessment	60.00%
Final Assessment	40.00%

Details of Continuous Assessment

Assessment Type	Assessment Description	% of Total Mark	CLO
Practical	Written Scientific Lab report	20%	CLO2
Presentation	Verbal Presentation on Case Study	15%	CLO3
Test	Ongoing Online Test Chapter 1 and Chapter 2	25%	CLO1

Reading List

Recommended Text

- **Lisa A. Urry,Michael L. Cain,Steven A. Wasserman,Peter V. Minorsky,Jane B. Reece,Neil A. Campbell 2017, *Campbell Biology, Global Edition*, 11th Ed., Pearson Education Inc [ISBN: 9781292170435]**

Reference Book Resources

- **Eldra Solomon,Charles Martin,Diana Martin,Linda Berg 2015, *Biology*, 10th Ed., Thomcon Learning Inc [ISBN: 9781285423586]**
- **Starr, C., Taggart, R. & Evers, C. 2013, *Biology: The Unity and Diversity of Life*, 13th Ed., Pearson Education Inc [ISBN: 13: 978-11114]**
- **Bruce Alberts,Dennis Bray,Karen Hopkin,Alexander Johnson,Julian Lewis 2013, *Essential Cell Biology*, 4 Ed., Garland Science [ISBN: 9780815344544]**
- **Peter Stiling,Robert Brooker,Linda Graham,Eric Widmaier 2016, *Biology*, 4th Ed., McGraw-Hill Education [ISBN: 9781259188121]**
- **Audesirk, G., Audesirk T. and Byers, B.E. 2016, *Biology: Life on Earth with physiology*, 11th Ed., Pearson College Division [ISBN: 9780134142951]**

Article/Paper List: This Course does not have any article/paper resources

Other References: This Course does not have any other resources