UNIVERSITI TEKNOLOGI MARA

AGA572: AGRICULTURAL CLIMATOLOGY

Course Name (English)	AGRICULTURAL CLIMATOLOGY APPROVED
Course Code	AGA572
MQF Credit	3
Course Description	This course is focusing on the concept regarding climate variability and how it affects the agriculture productions. The distributions and types of climate in the world have been studied generally and in Malaysia specifically. The impact of climate on the agriculture productions in term on water, plant leaf, environment such as soil and also ecosystem as a whole.
Transferable Skills	Development of skills through academic visit and presentation Demonstrate ability to identify and articulate self skills, knowledge and understanding confidently and in a variety of context.
Teaching Methodologies	Lectures, Field Trip, Case Study, Presentation
CLO	CLO1 Explain the elements of climatology and their distribution in various climatic regions CLO2 Identify the major crops of Malaysia and explain their distributions and limitations according to the climatic conditions. CLO3 Communicate to peers and team members, in the classroom and in the fieldwork verbally and to the facilitator in writing on the techniques of agricultural climatology
Pre-Requisite Courses	No course recommendations

Topics
1. 1.0 Climates and Agriculture 1.1) 1.1 Agriculture and environment 1.2) 1.2 Agricultural environment and its components 1.3) 1.3 Eco-systems and ecology
2. 2.0 The Atmosphere 2.1) 2.1 Solar and Terrestrial Radiation 2.2) 2.2 Atmospheric Temperature and Moisture in the Atmosphere 2.3) 2.3 Precipitation and Satelite
3. 3.0 Microclimate Factors 3.1) 3.1 Microclimate profile 3.2) 3.2 Modifying the temperature of microclimate 3.3) 3.2.1 Canopy vegetation 3.4) 3.2.2 Nonliving canopies 3.5) 3.2.3 Soil surface cover 3.6) 3.2.4 Greenhouses and shade houses 3.7) 3.3 Temperature and sustainability
4. 4.0 Hydrometeorology 4.1) 4.1 Cycling of water on land 4.2) 4.2 Interception and through fall 4.3) 4.3 Evapotranspiration 4.4) 4.4 Infiltration 4.5) 4.5 Overland flow 4.6) 4.6 Soil water 4.7) 4.7 Runoff processes 4.8) 4.8 River flow 4.9) 4.9 Soil microclimate

5. 5.0 Biometeorology 5.1) 5.1 Leaf fluxes and temperature 5.2) 5.2 Leaf size and shape 5.3) 5.3 Light reactions 5.4) 5.4 Dark reactions 5.5) 5.5 Stomata 5.6) 5.6 Net photosynthesis 5.7) 5.7 Transpiration 5.8) 5.8 Leaf area index (LAI) 5.9) 5.9 Canopy photosynthesis 5.10) 5.10 Environmental controls of canopy fluxes
6. 6.0 Terrestrial Plant Ecology 6.1) 6.1 Carbon balance of plants 6.2) 6.2 Seasonality of growth and development 6.3) 6.3 Plant functional types 6.4) 6.4 The ecosystem concept 6.5) 6.5 Ecosystem structure and function 6.6) 6.6 Litter fall and soil carbon 6.7) 6.7 Climate Change
7. 7.0 Terrestrial Forcing and Feedbacks 7.1) 7.1 Tropical deforestation 7.2) 7.2 Irrigation 7.3) 7.3 Wetland drainage 7.4) 7.4 Global carbon cycle 7.5) 7.5 Carbon storage on land 7.6) 7.6 Rainfall and other climate influences
8. 8.0 Major Crop Climatic Requirements of Malaysia 8.1) 8.1 Oil Palm and rubber 8.2) 8.2 Paddy and cocoa
9. Final Exam 9.1) n/a

Assessment Breakdown	%
Continuous Assessment	50.00%
Final Assessment	50.00%

Details of Continuous Assessment

Assessment Type	Assessment Description	% of Total Mark	CLO
Assignment	Covering Chapter 1 - 8	20%	CLO3
Case Study	Covering Chapter 1 - 5	20%	CLO2
Presentation	Individual presentation based on the assignment	10%	CLO3

Reading List

Reference Book Resources

- ***Meteorology Today: An Introduction to Weather, Climate, and the Environment*,, 9th Ed., Brooks/Cole**
- **Jen-Hu Chang 2009, *Climate and Agriculture: An Ecological Survey*, Aldine Transaction**
- **Pittock, A. Barrie 2009, *Climate Change: The Science, Impacts and Solution*, 2nd Ed., CSIRO**
- **Howard A. Bridgman, John E Oliver 2006, *The Global Climate System: Patterns, Processes, and Teleconnections*, Cambridge University Press**
- **Reddy, K.R. and H.F. Hodges 2000, *Climate Change and Global Crop Productivity*, CABI**
- **Hall, A.E 2001, *Crop Responses to Environment*, CRC Press New York**
- **John J. Hidore, John E. Oliver 1993, *Climatology: An Atmospheric Science*, Maxwell Macmillan International**
- **Frederick K. Lutgens, Edward J. Tarbuck 1992, *The Atmosphere*, Prentice Hall International**

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

Other References: This Course does not have any other resources