UNIVERSITY OF SARGODHA

DEPARTMENT OF AGRONOMY, COLLEGE OF AGRICULTURE

COURSE OUTLINE Spring -2020

Course Title: Climate Change and Agriculture

Course Code: AGRO-7117

Credit Hours: 3(3-0)

Instructor: Dr. Amjed Ali

Email: amjed.ali@uos.edu.pk

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| **DESCRIPTION** |

The course of “Climate Change and Agriculture” will be helpful for improving the student’s knowledge and awareness about the climate change and their impact on crop production. The key objectives/outcomes of this course are; to develop ink-link about crop production under changing climate as well asmitigation and Adaptation strategies for climate change and their impact on crop productivity.

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| **LEARNING OUTCOMES** |

The key objectives of the course are:

* To study the impact of climate change on various crops.
* To determine the influence of changing climate on insects pests, diseases and weeds.
* To adopt the strategy for minimizing the effect of climate change on crops.

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| **CONTENTS** |

1. Climate and agriculture
2. Climate variability and change, -past, present and future scenario.
3. Impact of climate change in different regions.
4. Influence of climate change on productivity of major and minor crops.
5. Implications of changing climatic scenario for pests, livestock and natural resources.
6. Strategies for managing climate change and vulnerability.
7. Capacity building and action plan for policy makers and planners.
8. Concept of REDD Plan (Reducing Emissions from deforestation and forest degradation) plus, climate monitoring.
9. Mitigation and Adaptation strategies for climate change, Carbon sequestration and World weather Institutes (NAMA, INDC and CDM).

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| **READINGS** |

1. Hillel, D. and C. Rosenzweig. 2013. Handbook of Climate Change and Agro ecosystems: Global and Regional Aspects and Implications. Imperial College Press, London, UK.
2. Anboumozhi, V., M. Breiling, S. Pathmarajah and V.R. Reddy. 2012. Climate Change in Asia and the Pacific: How can Countries Adapt? SAGE Publication India Pvt. Ltd.
3. Sivakumar, M.V.K. and R.P. Motha. 2007. Managing Weather and Climate: Risks in Agriculture. Springer, Berlin, Heidelberg, New York.
4. Sivakumar, M.V.K. and J. Hansen. 2007. Climate Predictions and Agriculture. Springer, Berlin, Heidelberg, New York.
5. Mavi, H.S. and G.J. Tupper. 2005. Agro meteorology Principles and Application of Climate Studies in Agriculture. International Book Distribution Co., Lucknow, India.
6. Sivakumar, M.V.K. and R.P. Motha. 2005. Increasing Climate Variability and Change: Reducing the vulnerability of agriculture and forestry. Springer, Dordrecht, The Netherlandi.

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| COURSE | | |
| **Week** | **Topics and Readings** | **Book with Page No.** |
| 1. | Introduction of course contents | ---------------------------- |
| Climate Change and Agriculture (Causes) | Crop Stress Management and Global Climate Change. Page 1-11 |
| Climate Change and Agriculture (Causes) | --------------------------------- |
| 2. | Climate variability and change, -past scenario. | (Book: Crops and Environmental Change; Chapter 1 Pg. 1-10) |
| Climate variability and change, present scenario. | ------------------------------ |
| Climate variability and change, future scenario. | -------------------------------- |
| 3. | Influence of climate change on productivity of major crops | (Book: Crops and Environmental Change; Chapter 1 Pg. 11-20) |
|  | Influence of climate change on productivity of major crops  (Cereals) | ---------------------------- |
|  | Influence of climate change on productivity of major crops  (Cereals) | ---------------------------- |
| 4. | Influence of climate change on productivity of major Crops (Cereals) | (Book: Crops and Environmental Change; Chapter 8 Pg. 225-240) |
| Influence of climate change on productivity of major Crops (Cotton) | ------------------------- |
| Influence of climate change on productivity of major Crops (Cotton) | --------------------------- |
| 5. | Influence of climate change on productivity of minor Crops (Pulses) | (Book: Crops and Environmental Change; Chapter 8 Pg. 241-250) |
| Influence of climate change on productivity of minor Crops (Pulses) | --------------------------- |
| Influence of climate change on productivity of minor Crops (Pulses) | ------------------------------ |
| 6. | Influence of climate change on productivity of minor Crops (Oil Seed Crops) | (Book: Crops and Environmental Change; Chapter 9 Pg. 272-290) |
| Influence of climate change on productivity of minor Crops (Oil Seed Crops) | ------------------------------- |
| Influence of climate change on productivity of minor Crops (Oil Seed Crops) | ------------------------------ |
| 7. | Influence of climate change on productivity of minor Crops (Sugar Crops) | (Book: Crops and Environmental Change; Chapter 9 Pg. 272-290) |
| Influence of climate change on productivity of minor Crops (Sugar Crops) | ---------------------------------- |
| Influence of climate change on productivity of minor Crops (Sugar Crops) | ----------------------------- |
| 8. | Implications of changing climatic scenario for pests, livestock and natural resources. | Agro-meteorology; Page, 304-319.  (Book: Crops and Environmental Change; Chapter 10 Pg. 313-334) |
| Implications of changing climatic scenario for pests, livestock and natural resources. | -------------------------- |
| Implications of changing climatic scenario for pests, livestock and natural resources. | --------------------------- |
| 9. | **Mid Term Examination** |  |
| 10. | Strategies for managing climate change and vulnerability | Understanding options for Agricultural production;Page. 267-280, Crop Stress Management and Global Climate Change; Page 172-190 |
| Strategies for managing climate change and vulnerability | -------------------------------- |
| Strategies for managing climate change and vulnerability | -------------------------------- |
| 11 | Strategies for managing climate change and vulnerability | Understanding options for Agricultural production; Chapter 13, Pg. 280-290) |
| Strategies for managing climate change and vulnerability | ------------------------- |
| Strategies for managing climate change and vulnerability | --------------------------- |
| 12. | Capacity building and action plan for policy makers and planners. | (Book, Understanding options for Agricultural production; Chapter 17 Pg. 347-365) |
| Capacity building and action plan for policy makers and planners. | Crop Stress Management and Global Climate Change; Page 190-203 |
| Capacity building and action plan for policy makers and planners. | ---------------------------------- |
| 13. | Concept of REDD Plan (Reducing Emissions from deforestation and forest degradation) plus, climate monitoring. | Agro-Meteorology; Page 320-340  <https://en.wikipedia.org/wiki/Reducing_emissions_from_deforestation_and_forest_degradation> |
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| 14. | Concept of REDD Plan (Reducing Emissions from deforestation and forest degradation) plus, climate monitoring. | <https://en.wikipedia.org/wiki/Reducing_emissions_from_deforestation_and_forest_degradation> |
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| 15. | Carbon sequestration and World weather Institutes (NAMA, INDC and CDM). | <http://climateobserver.org/open-and-shut/indc/> |
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| 16. | Carbon sequestration and World weather Institutes (NAMA, INDC and CDM). | <http://climateobserver.org/open-and-shut/indc/> |
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| 17 | **Final Exam** | |

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| **ASSIGNMENT CRITERIA** |

**Sessional: 12**

Project: 3

Presentation: 6

Participation: 3

**Mid = 18 Final = 30**