



**Ministry Of Higher Education and Scientific Research**  
**Mustansiriyah University/College of Science/Dept. of Atmospheric Sciences**  
**Course Plan**



**Course No.:** Ph.D. – Postgraduate stage

**Course Name:** Extreme climate events

**Course Website:** <https://uomustansiriyah.edu.iq/e-learn/profile.php?id=274>

**Time Division:** 2hr Theoretical

**Semester & Year:** 2, 2022 /2023

2 credit hours, Prerequisite [2]

**Course Description**

Extreme weather and climate events are a major source of risk for all human societies. There is a pressing need for more research on such events. Various societal changes, such as increased populations in coastal and urban areas and increasingly complex infrastructure, have made us potentially more vulnerable to such events than we were in the past. In addition, the properties of extreme weather and climate events are likely to change in the twenty-first century owing to anthropogenic climate change.

**Course Intended Outcomes:**

At the end of the course, students expected to learn:

The definition, classification, and diagnosis of extreme events are far from simple. There is no universal unique definition of what is an extreme event. This course discusses these issues and presents a simple framework for understanding extreme events that will help enable future work in this important area of climate science and global reinsurance.

**Course Outline:**

Topes Covered	Week
<b>What is an extreme event?</b>	1
<b>Some definitions of weather and climate extremes</b>	2
<b>Severe, rare, extreme, or high-impact</b>	3
<b>Multidimensional nature of extreme events</b>	4
<b>Examples of extreme weather/climate events</b>	5
<b>Climate drivers and bushfires</b>	6
<b>Exam (1)</b>	7
<b>Changes in climate extremes and their impacts on the natural physical environment</b>	8
<b>Weather and climate events related to disasters</b>	9
<b>Requirements and methods for analyzing changes in extremes</b>	10
<b>Observed and projected changes in weather and climate extremes</b>	11
<b>Phenomena related to weather and climate extremes</b>	12
<b>Statistical diagnosis of extreme events</b>	13
<b>The origin of extreme events</b>	14
<b>Exam (2)</b>	15

**Textbooks:**

- C. Donald Ahrens, Perry Squires, (2011), **Extreme Weather and Climate**, Broc/Cole, 528p.

**Suggested references:**

- Beniston, M, Stephenson, D. B., Christensen, O. B., et al. (2006). **Future extreme events in European climate: an exploration of regional climate model projections**. Climatic Change, PRUDENCE special issue.
- McGregor, G. R., Ferro, C. A. T., and Stephenson, D. B. (2005). **Projected changes in extreme weather and climate events in Europe**. In Extreme Weather and Climate Events and Public Health Responses, ed. W. Kirch, B. Menne, and R. Bertollini. Dresden: Springer, pp. 13–23.
- Intergovernmental Panel on Climate Change (IPCC) (2001). **Climate Change 2001: Synthesis Report**. Cambridge: Cambridge University Press.

**Marking:**

Second Semester					Final Exam	Final Mark
1st exam	2nd exam	Practical	Activity	Total	70	100
10	10		10	30		

**Assignments and/ or Projects:**

Marking	Due Date	Description	Assignment/ Project

**Instructor(s) information**

1. **Lecture Room No.:** [Postgraduate room]

**Time:** Sunday (12:30 – 02:30)

**Instructor's Name:** Prof. Dr. Hazim H. Hussain

**Office No.:** 5

**Office Hours:** Thursday (10:30-02:30)

**E-Mail:** [dr.hazim@uomustansiriyah.edu.iq](mailto:dr.hazim@uomustansiriyah.edu.iq)

**NOTES:**

- *Office Hours: Other office hours are available by appointment.*
- *The content of this syllabus not be changed during the current semester.*

Lecturer Signature  
Prof. Dr. Hazim H. Hussain  
/ /2023

Chairman Signature  
/ /2023