

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<b>Atmospheric physics</b>		Module Delivery	
Module Type	<b>Elective</b>		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code				
ECTS Credits	<b>4</b>			
SWL (hr/sem)	<b>100</b>			
Module Level	3	Semester of Delivery		6
Administering Department	PHY	College	COS	
Module Leader	Dr.Jasim mohammed Khalel		e-mail	Jasim_mo@uodiyala.edu.iq
Module Leader's Acad. Title	Assistant Professor		Module Leader's Qualification	Ph.D.
Module Tutor			e-mail	
Peer Reviewer Name	Dr.Dhar Intesar Bakr		e-mail	dher@uodiyala.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	6
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Objectives</b> أهداف المادة الدراسية	<ol style="list-style-type: none"> <li>1. To develop problem solving skills and understanding of atmospheric physics</li> <li>2. To understand layer of atmosphere, type of physical mechanism in atmosphere.</li> <li>3. This course deals with the concept of atmospheric physics.</li> <li>4. To identify the main phenomena in the atmosphere.</li> <li>5. To understand type of energy and their measurement methods.</li> <li>6. To perform the cloud physics and precipitation technique.</li> </ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1. Recognize the properties of atmospheric layer.</li> <li>2. List the various phenomena in the atmosphere.</li> <li>3. Summarize the characterization of cloud physics.</li> <li>4. Discuss type of energy and their calculation methods.</li> <li>5. Describe the radiation from the sun and its component that reflected from earth surface.</li> <li>6. Define methods of heat transferring in atmosphere.</li> <li>7. Identify the cloud condensation and dew point temperature.</li> <li>8. Discuss the cloud condensation nuclei.</li> <li>9. Discuss the various type of precipitation and measurements technique.</li> <li>10. Explain the global warming and its effect on climate change.</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <ul style="list-style-type: none"> <li>- Define the history of atmospheric gases and the atmospheric layers properties and the important composition of these layers . [10 hrs]</li> <li>- Emphasis the important physical presses that happened in atmosphere. [10 hrs]</li> <li>- Discuss the important phenomena in the atmosphere. [8 hrs]</li> <li>- Define the radiation and state the main methods of heat transfer. [5 hrs]</li> <li>- study the cloud condensation and the techniques of cloud seeding. [5 hrs]</li> <li>- learn the idea of climate change and global warming phenomenon. [10 hrs]</li> </ul>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their atmosphere physics and its phenomena thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	48	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	3.3
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	100		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	<b>Assignments</b>	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	<b>Projects</b>	1	10% (10)	Continuous	All
	<b>Report</b>	1	10% (10)	13	LO #5, #8 and #10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	10% (10)	7	LO #1 - #7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction to the Atmosphere and Descriptions of Atmospheric Behavior
<b>Week 2</b>	Mechanisms Influencing Atmospheric Behavior
<b>Week 3</b>	Layers, Composition and Structure of atmosphere
<b>Week 4</b>	Composition and Structure
<b>Week 5</b>	Description of Air and Stability in Terms of Temperature
<b>Week 6</b>	Atmospheric Radiation, Shortwave and Longwave Radiation
<b>Week 7</b>	Emission Planck's Law Wien's Displacement Law The Stefan-Boltzmann Law
<b>Week 8</b>	Midterm exam
<b>Week 9</b>	Microphysics of Clouds, cloud condensation, cloud nuclei
<b>Week 10</b>	Atmospheric phenomena
<b>Week 11</b>	precipitation types and measurements techniques
<b>Week 12</b>	Energy types and heat transfer methods
<b>Week 13</b>	Climate variability, climate change
<b>Week 14</b>	Global warming, greenhouse gases
<b>Week 15</b>	Influence of global warming on our life.
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

#### المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	
<b>Week 2</b>	
<b>Week 3</b>	
<b>Week 4</b>	
<b>Week 5</b>	
<b>Week 6</b>	
<b>Week 7</b>	

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Stevens, B. (2010). Twelve Lectures on Cloud Physics. <i>Max Planck Institute for Meteorology-University of Hamburg</i> .	no
<b>Recommended Texts</b>	Salby, M. L. (2012). <i>Physics of the Atmosphere and Climate</i> . Cambridge University Press.	no
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 – 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.