Form: Course Syllabus	Form Number	EXC-01-02-02A
	Issue Number and Date	2/3/24/2022/2963 05/12/2022
	Number and Date of Revision or Modification	2023/10/15
	Deans Council Approval Decision Number	265/2024/24/3/2
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	Number of Pages	07

1.	Course Title	Paleoclimate
2.	Course Number	0305984
3.	Credit Hours (Theory, Practical)	3, theory
	Contact Hours (Theory, Practical)	3, theory
4.	Prerequisites/Corequisites	-
5.	Program Title	PH.D in Geology
6.	Program Code	-
7.	School/ Center	School of Science
8.	Department	Geology
9.	Course Level	PH D program
10.	Year of Study and Semester (s)	-
11.	Other Department(s) Involved in Teaching the Course	-
12.	Main Learning Language	English
13.	Learning Types	✔ Face to face learning ☐Blended ☐Fully online
14.	Online Platforms(s)	✔ Moodle ✔ Microsoft Teams
15.	Issuing Date	2/05/2025
16.	Revision Date	

17. Course Coordinator:

Name:Dr . Bety Al-Saqarat

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18. Other Instructors:

Name:
Office number:
Phone number:
Email:
Contact hours:
Name:
Office number:
Phone number:
Email:
Contact hours:

19. Course Description:

The course examines the history of Earth's climate system through geologic time using physical, chemical, and biological proxies. It explores the mechanisms driving climate change, feedback loops, and the interpretation of climate archives such as ice cores, marine and lake sediments, speleothems, and paleosols. Emphasis is placed on analytical techniques and the implications for modern climate change understanding.

20.ProgramStudent Outcomes (SO's):(To be used in designing the matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program)

(SO1)Students will be able to design and execute original research, employing advanced methodologies to generate new knowledge in their specialized area of geology

(SO2)Students will display the potential to seriously evaluate complex geological problems, the usage of analytical and problem-fixing capabilities to develop modern answers and interpretations of their studies.

(SO3)Students will benefit know-how in using cutting-edge gear, techniques, and technology applicable to their geological research, applying these abilities to research and cope with complicated geological phenomena.

(SO4)Students will effectively communicate their studies findings via academic guides, presentations, and conferences, making significant contributions to the scientific network and attractive technical and non-technical audiences.

(SO5)Students will showcase a sturdy dedication to ethical studies practices and apprehend the broader societal and environmental affects of their work, promoting sustainability and integrity within the subject.

(SO6)Students will demonstrate a determination to persistent mastering, actively enticing with rising studies, and professional improvement possibilities to maintain and amplify their know-how throughout their careers.

PILO's	*National Qualifications Framework Descriptors*		
	Competency (C)	Skills (B)	Knowledge (A)
1.	✔	✔	✔
2.	✔	✔	✔
3.		✔	✔
4.		✔	✔
5.	✔		✔
6.	✔		✔

21. Course Intended Learning Outcomes (CLO's): (Upon completion of the course, the student will be able to achieve the following intended learning outcomes)

- **CLO1**: Identify and evaluate major paleoclimate proxy systems and their interpretation.
- **CLO2**: Analyze and model paleoclimate data sets using statistical and geochemical tools.
- **CLO3**: Reconstruct past climate variability using multi-proxy approaches.
- **CLO4**: Critically assess the linkages between paleoclimate records and climate system feedbacks.
- **CLO5**: Evaluate paleoclimate implications for future climate projections and policy.
- **CLO6**: Design and propose original research on paleoclimate topics using appropriate proxy techniques.

Course CLOs	The learning levels to be achieved					
	Remembering	Understanding	Applying	Analysing	evaluating	Creating
CLO (1)	✔	✔	✔	✔	✔	
CLO (2)		✔	✔	✔	✔	
CLO (3)		✔	✔	✔	✔	✔
CLO (4)		✔	✔	✔	✔	
CLO (5)		✔	✔	✔	✔	
CLO (6)		✔	✔	✔	✔	✔

22. The matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program:

Program SO's / Course CLO's	SO (1)	SO (2)	SO (3)	SO (4)	SO (5)	SO (6)	Descriptors		
							A	B	C
CLO (1)	✔	✔					✔	✔	
CLO (2)		✔	✔					✔	
CLO (3)		✔	✔				✔	✔	
CLO (4)		✔					✔	✔	
CLO (5)					✔		✔		✔
CLO (6)	✔			✔		✔	✔	✔	✔

23. Topic Outline and Schedule:

Week	Lecture	Topic	CLO/sLinked to the Topic	Learning Types (Face to Face/Blended/ Fully Online)	Platform Used	Synchronous / Asynchronous Lecturing	Evaluation Methods	Learning Resources
1		Introduction to Paleoclimatology	1	Face to Face	MOODLE		-	Selected reading
2	2	Earth's Climate System: Components & Feedbacks	1	Face to Face			Assignments	Textbook
3	2	Paleoclimate Proxies: Overview	1	Face to Face			Assignments	Selected reading
4	2	Marine and Lake Sediment Proxies	1, 2	Face to Face			Quiz	Papers
5	2	Stable Isotopes in Paleoclimate	2	Face to Face			Assignments	Textbook
6	2	Ice Core Records and Atmospheric Gases	2, 3	Face to Face			Assignments	Textbook
7	2	Pollen, Speleothems, and Other Biological Indicators	3	Face to Face			Assignments	Papers
8	2	Midterm Exam	-	Face to Face			Exam	-
9	2	Paleoclimate Modeling Techniques	2, 4	Face to Face			Assignments	Selected reading

10	2	Cenozoic Climate Change	4	Face to Face			Assignments	Papers
11	2	Paleoclimate of the Mesozoic and Paleozoic Eras	4, 5	Face to Face			Assignments	Textbook
12	2	Abrupt Climate Events (e.g., PETM, D-O events)	5	Face to Face			Quiz	Selected reading
13	2	Human Evolution and Climate	5	Face to Face			Discussion	All
14	2	Presentations / Final Exam	6	Face to Face			Presentation/ Final Exams	

24. Evaluation Methods:

Opportunities to demonstrate achievement of theCLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	CLO/s Linked to the Evaluation activity	Period (Week)	Platform
Midterm Exam	30%	1-7	1,2,3	1-3	Face to Face
Home Assignments	10%	Weekly	All	1-5	Moodle
Project and presentation	20%	Term-Long	All	3-6	Face to Face
Final Exam	40%	8-14	3-6	4-6	Face to Face

25. Course Requirements:

students should have a computer, internet connection, account on a specific software/platform…(elearning)

26. Course Policies:

A- Attendance policies: following the school regulations.

B- Absences from exams and submitting assignments on time: following the school regulations.

C- Health and safety procedures: following the school regulations.

D- Honesty policy regarding cheating, plagiarism, misbehavior: following the school regulations.

E- Grading policy: following the school regulations.

F- Available university services that support achievement in the course: NA.

27. References:

A. Required:

- Bradley, R. S. (2015). *Paleoclimatology: Reconstructing Climates of the Quaternary*. 3rd ed. Academic Press.
- Cronin, T. M. (2010). *Paleoclimates: Understanding Climate Change Past and Present*. Columbia University Press.

B. Recommended:

- Ruddiman, W. F. (2014). *Earth's Climate: Past and Future*. W. H. Freeman.
- Zachos, J., & Dickens, G. (2016). Selected papers on Cenozoic climate change.

28. Additional information:

	Signature:	Date:
Name of the Instructor or the Course Coordinator: **Dr. Bety Saqarat**	……..……	**2/05/2025**……
Name of the Head of Quality Assurance Committee/ Department	Signature:	Date:
	……..……	……..……
Name of the Head of Department **Dr Bety Saqarat**	Signature: ……..……	Date: ……..……
Name of the Head of Quality Assurance Committee/ School ofScience **Prof. Emad A. Abuosba**	Signature: ……..……	Date: ……..……
Name of the Dean or the Director **Prof. Mahmoud I. Jaghoub**	Signature: ……..……	Date: ……..……