



## الخطة البحثية لقسم الجيولوجيا 2030

## الخطة البحثية لقسم الجيولوجيا 2030 المتوافقة مع استراتيجية التنمية المستدامة، رؤية مصر 2030

تهدف أبحاث علم الجيولوجيا إلى خدمة الأهداف الآتية:

1. استخدام الطرق الجيوفيزيائية في البحث والتنقيب عن البترول والمعادن، والموارد الطبيعية، والمياه الجوفية، والآثار.
2. استخدام الطرق الجيوفيزيائية في دراسة الزلازل والبراكين والكوارث الطبيعية والجيولوجيا الهندسية والمشاكل البيئية.
3. دراسات بترولوجية ومعدنية الصخور النارية والرسوبية والمتحولة ودورها في الجيولوجيا البيئية والجيولوجيا الهندسية وجيولوجيا الآثار.
4. دراسة الحفريات والطبقات والطباقية التتابعية ودورها في تحديد بيئات الترسيب وعلاقتها بخزانات الهيدروكربونات ومصادر الطاقة غير المتجددة.
5. دراسات جيوكيميائية الصخور وجيولوجيا النظائر وتكنولوجيا الخامات الاقتصادية ودورها في التطبيقات الصناعية،
6. دراسة جيولوجيا المناجم، جيولوجيا البحار ومصادر الطاقة البديلة وإدارة الأزمات الجيولوجية.
7. استخدام النظائر المشعة لتحديد الأعمار والاحداث الجيولوجية.
8. دراسة جيولوجيا المياه ودورها في تحليل أحواض الصرف للتعرف على أخطار السيول ود راسه علاقتها بخزانات المياه الجوفية لتعزيز الاستفاد من مياه الأمطار مصر.
9. الدراسات الجيوبئية ودورها في تحقيق التنمية المستدامة لبعض المناطق بمصر وإعداد الخطط البحثية لتنمية المجتمعات العمرانية الجديدة.
10. استخدام الكائنات البحرية الدقيقة لتحديد درجات التلوث بالبحار والبحيرات المصرية والاستعانة ببعض البرامج الاحصائية لتحديد الظروف البيئية والتوزيع الجغرافي القديم للحفريات.
11. دراسة واستخدام تقنيات الاستشعار من بعد ونظم المعلومات الجغرافية في مجالات الجيولوجيا والموارد الطبيعية ومصادر المياه والدراسات البيئية وآثار تغيرات المناخ.
12. استخدام تحليل البيانات الضخمة والذكاء الاصطناعي وتكنولوجيات التعليم الرقمي في الموارد المائية والتطبيقات الجيولوجية.
13. الدراسات البيئية لساحل البحر المتوسط والبحيرات الشمالية للدلتا وشمال سيناء.
14. دراسة التراكيب الجيولوجية السطحية وتحت السطحية والتطور التكتوني وتطبيقاتها في مجالات التنقيب عن البترول والخامات المعدنية.

## **سوف تعمل هذه الموضوعات على خدمة المحاور التالية لتنفيذ استراتيجية التنمية المستدامة، رؤية مصر 2030:**

- المحور الأول: الطاقة
- المحور الثاني: المياه
- المحور الرابع: الزراعة والغذاء
- المحور الخامس: البيئة والموارد الطبيعية
- المحور السادس: التطبيقات التكنولوجية والعلوم المستقبلية
- المحور السابع: الصناعات الاستراتيجية
- المحور الثامن: تكنولوجيا المعلومات والاتصالات والفضاء
- المحور الحادي عشر: الاستثمار والتجارة
- المحور الثاني عشر: صناعة السياحة

الموضوعات البحثية	ما يحققه من أهداف القسم	ما يتوافق معه من محاور خطة الدولة
6-1-1 The use of seismic method to delineate the characteristic features of salt.	6-1-1-1	Using seismic data for mapping and detecting the depth to salt layer in Egypt Offshore.
	6-1-1-2	Using seismic data for mapping the depth to the Pliocene sedimentary cover offshore North Sinai and Nile Delta
	6-1-1-3	Using reflection seismic data to define the characteristics features of salt on seismic section.
	6-1-1-4	Using seismic data to differentiate between the different forms of salt and shale on seismic section.
6-1-2 The use of shallow seismic refraction and electric data to locate the archeological bodies in Egypt.	6-1-2-1	Processing and interpretation of shallow seismic data for mapping the depth to the archeological bodies.
	6-1-2-2	Interpretation of refraction seismic data to define the boundaries of this buried bodies.
6-1-3 the use of gravity and magnetic data for detecting the geothermal reservoir.	6-1-3-1	Processing and interpreting the potential data for detecting Geothermal anomalies in Western Desert.
	6-1-3-2	Using magnetic data for mapping the depth to the geothermal reservoir.
6-1-4 The use of the geophysical techniques to differentiate between types of crust in Egypt.	6-1-4-1	Using gravity and magnetic data to define the different types of crust (Oceanic or Continental) and calculating the thickness of each type in Egypt.
6-1-5 Evaluation of Gas wells in Nile Delta using well logging data.	6-1-5-1	Use of Neutron and density logs in combination with RFT data to obtain gas density and wettability.
	6-1-5-2	Formation evaluation techniques to get reservoir petrophysical parameters.
6-1-6 Evaluation of Oil wells in Gulf of Suez and Sinai using well logging data.	6-1-6-1	General correlation model among porosity-permeability and formation resistivity factor to evaluate porosity architecture
	6-1-6-2	Recovery efficiency factor using deduced water and irreducible water saturations.
6-1-7 Evaluation of oil and gas wells in Western Desert using well logging data.	6-1-7-1	Complex reservoir analysis with the aid of computer software facilities.
	6-1-7-2	Reservoir evaluation using traditional well log data in addition to new well log techniques.

## 2-6 دراسات رسوبية وطباقية تتابعية وحفرية

ما يتوافق معه من محاور خطة الدولة	ما يحققه من أهداف القسم	الموضوعات البحثية	
1 & 5	3, 4 & 14	6-2-1-1 Facies architecture and depositional evolution of alluvial fan and fan delta systems in the Gulf of Suez	<b>6-2-1 Tectono-stratigraphic evolution of extensional basins</b>
1 & 5	3, 4 & 14	6-2-1-2 Controls on the stratigraphic development of shallow marine syn-rift sequences, Gulf of Suez	
1 & 5	3, 4 & 14	6-2-1-3 Architecture and evolution of syn-rift clastic depositional systems towards the tips of major fault segments, NW Red Sea Rift	
1 & 5	3, 4 & 14	6-2-1-4 Evolution of the Miocene Gilbert-type delta, Gulf of Suez-NW Red Sea Rift	
1 & 5	3, 4 & 14	6-2-1-5 Sedimentological and architecture evolution of the alluvial fan deposits	
1 & 5	3 & 4	6-2-2-1 Evolution of the Middle Miocene carbonate platform, Red Sea Coastal area, Egypt	<b>6-2-2 Geochronology and, stratigraphy, and ichnology of the Neoproterozoic - Phanerozoic successions</b>
1 & 5	3 & 4	6-2-2-2 Applied ichnofossil studies of the subsurface succession in the north Western Desert, Egypt.	
1 & 5	3 & 4	6-2-2-3 Stratigraphy of subsurface Paleogene- Lower Neogene succession in the Qattara Depression area, north Western Desert, Egypt.	
1 & 5	3 & 4	6-2-2-4 Geologic evolution of some Cretaceous-Paleogene successions, Western Desert, Egypt.	
1 & 5	3 & 4	6-2-2-5 Sedimentological and petrophysical characteristics of the Gulf of Suez and Western Desert reservoirs.	
1 & 5	3 & 4	6-2-2-6 Sedimentological Evolution, sequence stratigraphy and hydrocarbon potentialities of the Neogene-Quaternary succession, north central Nile Delta	
1 & 5	3 & 4	6-2-2-7 Integrated ichnology, sedimentology and Stratigraphy of some Cretaceous successions, Sinai, Egypt	
1 & 5	3, 4, 5 & 7	6-2-2-8 Isotope Stratigraphy of the Upper Cretaceous and Lower Paleogene succession in Western Sinai and North Eastern Desert	
1 & 5	3 & 4	6-2-2-9 Ichnofossil assemblages of mixed siliciclastic-carbonate successions	

2-6 تابع: دراسات رسوبية وطباقية تتابعية وحفرية

ما يتوافق معه من محاور خطة الدولة	ما يحققه من أهداف القسم	الموضوعات البحثية	
1 & 5	3, 4, 5 & 10	6-2-2-10 Integrated ichnology, Sequence Stratigraphy and Geophysics of some subsurface Miocene successions, Sinai, Egypt	<b>6-2-2 Geochronology and, stratigraphy, and ichnology of the Neoproterozoic - Phanerozoic successions</b>
1 & 5	3, 4, 5 & 10	6-2-2-11 Geochronology, sedimentology, stratigraphy and paleoecology of the Precambrian (Neoproterozoic) deposits in Egypt.	
1 & 5	3, 4, 5 & 10	6-2-2-12 Paleoecology, taphonomy and macro fossils of the Phanerozoic successions.	
1 & 5	3, 4 & 5	6-2-3-1 Early marine diagenesis of the reef terraces, Red Sea coast	<b>6-2-3 Diagenesis of the shallow marine sequences</b>
1 & 5	3, 4 & 5	6-2-3-2 Dolomitization and dedolomitization of the middle Miocene carbonate sediments, Red Sea	
1 & 5	3, 4 & 5	6-2-3-3 Mixed siliciclastic-carbonate-evaporite sequences deposited in semi-arid setting.	
1 & 5	3, 4 & 5	6-2-3-4 Dolomitization and reservoir development of the Miocene syn-rift sequences, Gulf of Suez	
1 & 5	3, 4 & 5	6-2-3-5 Diagenesis influencing the porosity of some reservoir sandstones, Gulf of Suez and North Western Desert	
1 & 5	3, 4 & 5	6-2-4-1 The relationship between the Quaternary reef terraces and the beach rocks, Red Sea coast Egypt: Sedimentological and diagenetic aspects.	<b>6-2-4 Quaternary sediments, aeolian and sabkha deposits in arid zone provide key data for modeling previous palaeoenvironmental conditions</b>
1 & 5	3, 4 & 5	6-2-4-2 Lithostratigraphy and archeology of the Quaternary sediments, Nile Delta, Egypt.	
1 & 5	3, 4 & 5	6-2-4-3 Quaternary paleoclimate and paleoenvironment of the north Nile Delta area.	
1 & 5	3, 4 & 5	6-2-4-4 Geoenviromental evolution of the water sources in the north of the Nile Delta	
1 & 5	3, 4 & 5	6-2-4-5 Sedimentology, diagenesis and sequence stratigraphy of the last interglacial carbonate aeolinites, Burg El-Arab, Northern Coast, Egypt	

2-6 تابع: دراسات رسوبية وطبائيه تتابعية وحفرية

ما يتوافق معه من محاور خطة الدولة	ما يحققه من أهداف القسم	الموضوعات البحثية	
1 & 5	10 & 13	6-2-5-1 Biostratigraphy and paleobiogeography of the Early-Middle Miocene ostracods and foraminifera from the northern part of the Gulf of Suez, Egypt	<b>6-2-5 Micropaleontological studies on the Miocene sediments</b>
1 & 5	10 & 13	6-2-6-1 Paleobiogeographic implications of the Middle Eocene ostracods from Cairo-Suez district, Egypt	<b>6-2-6 Paleobiogeographic studies on the Eocene sediments</b>
1 & 5	10 & 13	6-2-7-1 Cenomanian, Turonian event from southern Sinai, Egypt	<b>6-2-7 Micropaleontological studies on the upper Cretaceous sediments</b>
1 & 5	10 & 13	6-2-8-1 Biostratigraphic studies on the Paleocene rocks of Sinai, Egypt	<b>6-2-8 Micropaleontological studies on the Paleocene sediments</b>
1 & 5	10 & 13	6-2-9-1 Ecology of Recent Benthic Foraminifera from the surface sediments of Mediterranean Sea	<b>6-2-9 Environmental studies on the surface sediments of the Mediterranean Sea</b>

### 3-6 المعادن والصخور ورواسب الخامات

ما يتوافق معه من محاور خطة الدولة	ما يحققه من أهداف القسم	الموضوعات البحثية	
5, 7 & 11	3 & 5	6-3-1-1 The Study of the distribution and economic validity of black sands in the Northern coastal area of the Delta.	<b>6-3-1 Ore deposits resources (Economic geology and geotourism)</b>
5, 7 & 11	3 & 5	6-3-1-2 The environmental impact of the mining activities in Egypt.	
5, 7 & 11	3 & 5	6-3-1-3 The rare metal mineralization in alkaline rocks, carbonatites and highly fractionated rare metal granites	
5, 7 & 11	3 & 5	6-3-1-4 Iron ores, their distribution and economic validity in Aswan and El Wahat areas.	
5, 7 & 11	3 & 5	6-3-1-5 Albitized granite in Sinai and the eastern Desert of Egypt, and related mineralizations.	
5, 7 & 11	3 & 5	6-3-1-6 Cu-Ni deposits in ultramafic associations.	
5, 7 & 11	3 & 5	6-3-1-7 Possibilities of diamond in subduction-related rocks	
5, 7 & 11	3 & 5	6-3-1-8 Platinum-Group elements and their distribution in the Egyptian Nubian shield	
5, 7 & 11	3 & 5	6-3-1-9 Shallow gold mineralization	
5, 7 & 11	3 & 5	6-3-1-10 Deep gold mineralization	
5, 7, 11 & 12	3 & 5	6-3-1-11 Geoheritage revival and sustainable development of Historical sites for both gemstones and ornamental stones	
5	3, 5 & 14	6-3-2-1 Red Sea tectonics and related geohazards.	<b>6-3-2 The tectonic framework of Egypt</b>
5	3, 5 & 14	6-3-2-2 Mediterranean Sea tectonics and natural resources.	
5	3, 5 & 14	6-3-2-3 The Neoproterozoic tectonics and their implications for climatic changes.	
5	3, 5 & 14	6-3-2-4 Neoproterozoic snowball events: evidences from the Eastern Desert	
5	3, 5 & 14	6-3-2-5 Tracking the effect of mantle-plume in the ANS.	
5	3, 5 & 14	6-3-2-6 Uplifting events and their effect on the topography of Egypt	
5	3, 5 & 14	6-3-2-7 Molasses basins and the paleorivers in the Eastern Desert	



### 3-6 تابع: المعادن والصخور ورواسب الخامات

ما يتوافق معه من محاور خطة الدولة	ما يحققه من أهداف القسم	الموضوعات البحثية	
7 & 11	3 & 5	6-3-3-1 Geochemical evolution of the Neoproterozoic mantle	<b>6-3-3 Geochemistry</b>
7 & 11	3, 5 & 14	6-3-3-2 Backarc vs. forearc ophiolites in the Eastern Desert of Egypt	
7 & 11	3 & 5	6-3-3-3 How juvenile is the arc-metavolcanics?	
7 & 11	3 & 5	6-3-3-4 Mantle-plume effect on the Arabian-Nubian Shield evolution	
5, 7 & 11	3 & 5	6-3-3-5 Neoproterozoic interaction between mantle and climate: criteria from carbonation events	
7 & 11	3 & 5	6-3-3-6 Mineralogy and mineral Chemistry of some rock forming minerals of the basement complex	
7 & 11	3 & 5	6-3-3-7 Crustal evolution of the Eastern Desert of Egypt.	
7 & 11	3 & 5	6-3-3-8 Suture zones and the Mozambique Ocean closure.	
7 & 11	3 & 5	6-3-3-9 The Arabian-Nubian Shield subduction proxies.	
7 & 11	3 & 5	6-3-3-10 The Arabian-Nubian shield in the framework of Gondwana amalgamation.	
7 & 11	3 & 5	6-3-3-11 Pre-Neoproterozoic crust in Sinai and the Eastern Desert of Egypt?	

#### 4-6 المياه الجوفية بالدلتا والوادي وسيناء والصحراء الغربية

ما يتوافق معه من محاور خطة الدولة	ما يحققه من أهداف القسم	الموضوعات البحثية	
2 & 4	8 & 9	6-4-1-1 Detection of groundwater contaminants in urban and agricultural areas in the Nile Delta	<b>6-4-1 Monitoring of groundwater contamination in the Nile Delta</b>
2 & 4	8 & 9	6-4-1-2 Hydrochemical monitoring of groundwater quality for drinking use in the Nile Delta.	
2 & 4	8 & 9	6-4-1-3 Hydrogeological impacts of groundwater on archeological sites in the Nile Delta.	
2 & 4	8 & 9	6-4-1-4 Environmental and geological studies on Wadi El Natrun Hill, West Nile Delta.	
2 & 4	8 & 9	6-4-1-5 Implications of hydrogeological sitting on development activities in the Nile Wadi and Nile Delta and their environs.	
2 & 4	8 & 9	6-4-1-6 Environmental impact of wastewater on ground water at the new communities in and around the Nile Delta and Nile Valley.	
2 & 4	5, 7, 8 & 8	6-4-2-1 Application of hydrochemistry and isotopic techniques for evaluation of water resources in Sinai.	<b>6-4-2 Evaluation of water resources in Sinai</b>
2 & 4	8 & 9	6-4-2-2 Hydrogeological evaluation of Craterous aquifers in North and Middle Sinai.	
2 & 4	8 & 9	6-4-2-3 Development of groundwater of alluvial deposits in Sinai.	
2 & 4	8 & 9	6-4-2-4 Impacts of groundwater over-pumping in the coastal area North Sinai	
2 & 4	8 & 9	6-4-3-1 Implication of gold mining on the environment and groundwater resources in the Eastern Desert.	<b>6-4-3 Hydrogeological studies on the groundwater resources in the Eastern and Western Desert</b>
2 & 4	8 & 9	6-4-3-2 Hydrogeological studies on the groundwater resources in the Oases of the Western Desert.	

## 5-6 استخدام تطبيقات الاستشعار من بعد ونظم المعلومات الجغرافية في علوم الارض

الموضوعات البحثية		ما يحققه من أهداف القسم	ما يتوافق معه من محاور خطة الدولة
6-5-1 Application of remote sensing and GIS techniques in mineral exploration and geologic mapping.	6-5-1-1	Using remote sensing for mapping and detecting REE in Egypt.	6, 7 & 11
	6-5-1-2	Using remote sensing and geophysical data for mapping and detecting gold deposits in Egypt.	5, 6, 7 & 11
	6-5-1-3	Using remote sensing and geophysical data for mapping and detecting radioactive minerals in Egypt.	5, 6, 7 & 11
	6-5-1-4	Using remote sensing and geophysical data for mapping ring complex in Egypt.	7 & 11
	6-5-1-5	Machine learning-based prediction of economic mineral concentration and mapping	7, 11 & 12
6-5-2 Application of remote sensing techniques and GIS for mapping economic deposits and building materials.	6-5-2-1	Processing and interpretation of remote sensing and geophysical data for mapping silica sand.	7 & 11
	6-5-2-2	Processing and interpretation of remote sensing data for mapping black sand.	5, 7 & 11
	6-5-2-3	Mapping and assessing rock salt as a raw material using Remote Sensing data.	5, 7 & 11
	6-5-2-4	Mapping and assessing limestone as raw materials using remote sensing data.	5, 7 & 11
6-5-3 Application of remote sensing techniques and GIS for mapping and detecting geothermal anomalies.	6-5-3-1	Mapping and processing remote sensing and geophysical data for detecting geothermal anomalies.	5, 7 & 11
	6-5-3-2	Using remote sensing data for mapping impact crater.	5, 7 & 11

5-6 تابع: استخدام تطبيقات الاستشعار من بعد ونظم المعلومات الجغرافية في علوم الارض

ما يتوافق معه من محاور خطة الدولة	ما يحققه من أهداف القسم	الموضوعات البحثية	
5, 7 & 11	5, 9 & 11	6-5-4-1 Mapping and processing remote sensing and geophysical data for detecting groundwater resources in Egypt.	<b>6-5-4 Application of remote sensing techniques and GIS for detecting and mapping groundwater resources and change detection.</b>
5, 7 & 11	5, 9 & 11	6-5-4-2 Detection of landscape development using remote sensing data.	
5, 7 & 11	5, 9 & 11	6-5-4-3 Detection of shoreline changes	
2, 5, 7, 11 & 12	5, 9 & 11	6-5-5-1 Monitoring the global climate change and sea level rise and their implication of the Egyptian environment using advanced remote sensing data	<b>6-5-5 Application of remote sensing techniques in environmental monitoring and protection</b>
2, 5, 7 & 11	5, 9 & 11	6-5-5-2 Detecting and monitoring the urban expansion over agricultural land and tracing air and water pollution using remote sensing data and change detection	

## 6-6 استخدام تحليل البيانات الضخمة وتكنولوجيات التعليم الرقمي في الموارد المائية

ما يتوافق معه من محاور خطة الدولة	ما يحققه من أهداف القسم	الموضوعات البحثية	
6, 7 & 11	5, 9 & 12	6-6-1-1 Terrestrial water storage reanalysis records in the Nile River Basin.	<b>6-6-1 Big Data analytics and machine learning applications in water resources assessment and monitoring.</b>
5, 6, 7 & 11	5, 9 & 12	6-6-1-2 Terrestrial water storage sensitivity to anthropogenic and climatic influence.	
5, 6, 7 & 11	5, 9 & 12	6-6-1-3 Response of Ecosystem productivity to changes in the terrestrial water storage.	
7 & 11	5, 9 & 12	6-6-1-4 Divergent trends in water resources availability in Africa's major water towers.	
7 & 11	5, 9 & 12	6-6-1-5 Spatiotemporal dynamics of terrestrial water storage variability and trends	
7 & 11	5, 9 & 12	6-6-2-1 Applications of high-frequency low-latency space gravity measurements in Hydroclimatic extremes.	<b>6-6-2 Applications of remote sensing hydrology in Hydroclimatic extremes.</b>
5, 7 & 11	5, 9 & 12	6-6-2-2 Assessing lake level variabilities using GRACE, Reanalysis, and hydrologic models.	
5, 7 & 11	5, 9 & 12	6-6-2-3 Coherence between hydrological regimes, climatic teleconnections in major transboundary rivers.	
5, 7 & 11	5, 9 & 12	6-6-2-4 Hydroclimatic discontinuities in Africa's transboundary river systems.	
5, 7 & 11	5, 9 & 12	6-6-3-1 Changes Sea surface temperature, and climatic teleconnections in Mediterranean region.	<b>6-6-3 Application of space gravity measurements in Sea surface temperature and sea level rise analysis.</b>
5, 7 & 11	5, 9 & 12	6-6-3-2 Assessing Potential Sea Level Rise impact using space gravity measurements.	

## 7-6 الإطار البنائي والتكتوني لمصر

ما يتوافق معه من محاور خطة الدولة	ما يحققه من أهداف القسم	الموضوعات البحثية	
1, 5 & 7	5, 8 & 14	6-7-1-1 Archaean tectonics of the Saharan Metacraton in the Western Desert.	<b>6-7-1 Precambrian Tectonics of Egypt</b>
1, 5 & 7	5, 8 & 14	6-7-1-2 Columbia supercontinent exposures.	
1, 5 & 7	5, 8 & 14	6-7-1-3 Rodinia supercontinent breakup and amalgamation tectonics in Egypt.	
1, 5 & 7	5, 8 & 14	6-7-1-4 Uplift and subsidence events in the Precambrian	
1, 5 & 7	5, 8 & 14	6-7-1-5 Precambrian mantle-plume tectonics in Egypt	
1, 5 & 7	5, 8 & 14	6-7-1-6 The Arabian-Nubian Shield tectonics.	
1, 5 & 7	5, 8 & 14	6-7-1-7 Gondwana supercontinent amalgamation tectonics.	
1, 5 & 7	5, 8 & 14	6-7-1-8 Precambrian rift systems in Egypt.	
1, 5 & 7	5, 8 & 14	6-7-2-1 Ordovician southward drift of Gondwana	<b>6-7-2 Phanerozoic tectonic framework of Egypt</b>
1, 5 & 7	5, 8 & 14	6-7-2-2 Paleo-Tethys Ocean tectonics	
1, 5 & 7	5, 8 & 14	6-7-2-3 Neo-Tethys Ocean tectonics	
1, 5 & 7	5, 8 & 14	6-7-2-4 Mesozoic tectonic inversion event	
1, 5 & 7	5, 8 & 14	6-7-2-5 Uplift and subsidence events in the Phanerozoic	
1, 5, 7 & 12	5, 8 & 14	6-7-2-6 The Gulf of Suez Rift	
1, 5, 7 & 12	5, 8 & 14	6-7-2-7 The Red Sea Rift system	
1, 5, 7 & 12	5, 8 & 14	6-7-2-8 The Mediterranean Sea tectonics	