The Scientific Research Plan for the Department of Construction and Utilities Engineering (2019-2024)

Country's Trends for Scientific Research 20/30	The Main Research Field	The Secondary Research Field	Research on Academic Degrees		Promotion Research 20%	Applied Research Projects 20%			The Scientific Department	Research Specialization	Priority
			Master's Thesis Topics 40%	Doctoral Dissertation Topics 20%		The Research Project	The Proposed Budget in EGP	Funding Source			
First: Economic Dimension, which includes the following axes: • **Economic Development and Energy** • **Science, Technology, and Innovation**	**1. Modern Technologies and Their Applications in Various Scientific Fields**	Analysis, Design, Implementation, Protection, and Rehabilitation of Structures	• Cost Elements Estimation • Estimation of the Required Time for Construction	-	• Achieving Optimal Utilization of Available Resources • Estimating Productivity Rates for Labor and Equipment	• Applications of Artificial Intelligence in Construction Projects	200,000	The Graduate Studies Fund	Construction and Utilities Engineering	Construction Engineering and Management	1
			• Study and Evaluation of Various Construction Systems and Practices	• Building Expert Systems for Various Construction Tasks • Modeling Construction Systems and Processes	• Study of Constructability and Its Enhancement Methods	• Study of Construction Systems and Practices	200,000	The Graduate Studies Fund	Construction and Utilities Engineering	Construction Engineering and Management	2

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Country's Trends for Scientific Research 20/30	The Main Research Field	The Secondary Research Field	Research on Academic Degrees		Promotion Research 20%	Applied Research Projects 20%			The Scientific Department	Research Specialization	Priority
			Master's Thesis Topics 40%	Doctoral Dissertation Topics 20%		The Research Project	The Proposed Budget in EGP	Funding Source			
		Study of Earth's Crust Deformations Using Monitoring via Satellite (GPS) and Conventional Geodetic Methods in Seismically Active Regions	• Study of Earth's Crust Deformations in Seismically Active Regions in Egypt	• Development of a Dynamic Model for Seismically Active Regions in Egypt	• Calculation of the Amount of Deformations in the Earth's Crust and Tectonic Interpretation	• Development of the National Network for Continuous Monitoring via Satellites	1,000,000	Academy of Scientific Research	Construction and Utilities Engineering	Surveying Engineering	1
		Study of Using GPS as a Source of Information for Atmospheric Layers Data	-	• Calculation of Meteorological Data from GPS Observations	• Study of the Current Situation in Egypt Using Available Data	• Development and Enhancement of Atmospheric Data with GPS Observations	1,00,000	The Graduate Studies Fund	Construction and Utilities Engineering	Surveying Engineering	2
		Using Geographic Information Systems to Study the Delta Subsidence Rate of the Nile	• Modeling the Inundation Rate for the Nile Delta Coast	-	• Creating a Topographic Model for the Nile Delta's Land Surface	• Establishing a Database for Geographic Information Systems Specifically for Nile Delta Data	1,00,000	The Graduate Studies Fund	Construction and Utilities Engineering	Surveying Engineering	3

The Scientific Research Plan for the Department of Construction and Utilities Engineering (2019-2024)

Country's Trends for Scientific Research 20/30	The Main Research Field	The Secondary Research Field	Research on Academic Degrees		Promotion Research 20%	Applied Research Projects 20%			The Scientific Department	Research Specialization	Priority
			Master's Thesis Topics 40%	Doctoral Dissertation Topics 20%		The Research Project	The Proposed Budget in EGP	Funding Source			
		Study of Surveying Applications for Remote Sensing	• Creating Survey Maps from Remote Sensing Imagery	-	• Creating a Topographic Survey Map for the City of Zagazig from Remote Sensing Imagery	• Establishing a Database for Remote Sensing Imagery	100,000	The Graduate Studies Fund	Construction and Utilities Engineering	Surveying Engineering	4
		Utilizing Satellite Gravimetry Technology to Develop and Determine the Geoid Surface in Egypt	-	• Creating an Accurate Geoid Surface for Egypt	• Study and Evaluation of the Impact of Earth's Gravity on Surveying Observations • Evaluation of Mathematical Models Used in Determining the Geoid Surface in Egypt	• Establishing a Database for Gravity and Geodetic Observations in Egypt to Develop the Egyptian Geoid Surface	1,000,000	Academy of Scientific Research	Construction and Utilities Engineering	Surveying Engineering	5

The Scientific Research Plan for the Department of Construction and Utilities Engineering (2019-2024)

Country's Trends for Scientific Research 20/30	The Main Research Field	The Secondary Research Field	Research on Academic Degrees		Promotion Research 20%	Applied Research Projects 20%			The Scientific Department	Research Specialization	Priority
			Master's Thesis Topics 40%	Doctoral Dissertation Topics 20%		The Research Project	The Proposed Budget in EGP	Funding Source			
		Enhancing the Accuracy of Monitoring Techniques on Satellites	• Study on Improving the Accuracy of GPS Usage and its Alternative Use for Engineering Surveys	-	• Study on Improving the Accuracy of GPS Usage and Its Alternative Use for Engineering Surveys	• Establishment of a GPS Observations Network in Egyptian Universities	1,000,000	Academy of Scientific Research	Construction and Utilities Engineering	Surveying Engineering	6
		Truck Weight Monitoring during Movement	-	• Traffic Congestion Control in Unplanned Cities	-	• Traffic Congestion Control in Unplanned Cities	400,000	Academy of Scientific Research	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	1
		Traffic Flow Simulation	-	-	-	• Estimation of Truck Factors on Egyptian Roads	400,000	Academy of Scientific Research	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	2
		Artificial Intelligence	-	-	-	• Utilizing Non-conventional Intersections to Solve Traffic Issues	300,000	Academy of Scientific Research	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	2
		Artificial Intelligence	-	-	-	• Developing a Guide for Auditing Traffic Safety on Egyptian Roads	300,000	Academy of Scientific Research	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	3

The Scientific Research Plan for the Department of Construction and Utilities Engineering (2019-2024)

Country's Trends for Scientific Research 20/30	The Main Research Field	The Secondary Research Field	Research on Academic Degrees		Promotion Research 20%	Applied Research Projects 20%			The Scientific Department	Research Specialization	Priority
			Master's Thesis Topics 40%	Doctoral Dissertation Topics 20%		The Research Project	The Proposed Budget in EGP	Funding Source			
		Artificial Intelligence	-	-	-	• Building Expert Systems for Bridge Maintenance	300,000	Academy of Scientific Research	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	3
		Applications of Geographic Information Systems and Real-Time Digital Maps in Traffic Engineering	-	-	-	• Building Expert Systems for Concrete Pavement Works	300,000	Academy of Scientific Research	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	3
		Applications of Geographic Information Systems and Real-Time Digital Maps in Traffic Engineering	-	-	-	• Developing Mechanisms for Urban Road Network Management Using Real-Time Digital Maps	300,000	Academy of Scientific Research	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	4

The Scientific Research Plan for the Department of Construction and Utilities Engineering (2019-2024)

Country's Trends for Scientific Research 20/30	The Main Research Field	The Secondary Research Field	Research on Academic Degrees		Promotion Research 20%	Applied Research Projects 20%			The Scientific Department	Research Specialization	Priority
			Master's Thesis Topics 40%	Doctoral Dissertation Topics 20%		The Research Project	The Proposed Budget in EGP	Funding Source			
		Study of Nanotechnology Applications in Road Engineering	• Study of Nanotechnology Applications in Road Engineering	• Evaluation of the Performance and Economic Viability of Nanotechnology in Road Engineering	• Evaluation of the Performance and Economic Viability of Nano-modified Asphalt and Concrete Mixtures, and the Economic Impact of Nanotechnology in Road Engineering	• Study of Nanotechnology Applications in Road Engineering	450,000	Academy of Scientific Research	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	4

The Scientific Research Plan for the Department of Construction and Utilities Engineering (2019-2024)

Country's Trends for Scientific Research 20/30	The Main Research Field	The Secondary Research Field	Research on Academic Degrees		Promotion Research 20%	Applied Research Projects 20%			The Scientific Department	Research Specialization	Priority
			Master's Thesis Topics 40%	Doctoral Dissertation Topics 20%		The Research Project	The Proposed Budget in EGP	Funding Source			
		Evaluation of Methods for Assessing Pavement Condition, Introducing Modern Assessment Techniques, and Reviewing the Efficiency of Maintenance Methods	• Evaluation of Methods for Assessing Pavement Condition	• Evaluation of Methods for Assessing Pavement Condition, Introducing Modern Assessment Techniques, and Reviewing the Efficiency of Maintenance Methods	• Evaluation of Methods for Assessing Pavement Condition, Introducing Modern Assessment Techniques, and Reviewing the Efficiency of Maintenance Methods	• Evaluation of Maintenance Methods Used in Egypt and Review of the Latest Global Technologies	350,000	Academy of Scientific Research	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	4
		Evaluation and Implementation of Modern Systems for Designing Rigid and Flexible Pavements for Roads, Airports, and Ports	• Evaluation of Modern Systems for Designing Rigid and Flexible Pavements	• Evaluation and Implementation of Modern Systems for Designing Rigid and Flexible Pavements	• Evaluation and Implementation of Modern Systems for Designing Rigid and Flexible Pavements	• Developing Systems for Designing Rigid and Flexible Pavements for Roads, Airports, and Ports	400,000	Academy of Scientific Research	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	4

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Country's Trends for Scientific Research 20/30	The Main Research Field	The Secondary Research Field	Research on Academic Degrees		Promotion Research 20%	Applied Research Projects 20%			The Scientific Department	Research Specialization	Priority
			Master's Thesis Topics 40%	Doctoral Dissertation Topics 20%		The Research Project	The Proposed Budget in EGP	Funding Source			
		Enhancing Asphalt Properties Through Polymers and Fibers for Sustainable Roads	-	-	• Evaluation of the Performance of Asphalt Enhanced with Polymers and Fibers for Sustainable Roads	• Enhancing Asphalt Properties Through Polymers and Fibers for Sustainable Roads	300,000	Academy of Scientific Research	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	
		Enhancing Concrete Properties Through Polymers and Fibers for Sustainable Roads	-	-	• Evaluation of the Performance of Concrete Enhanced with Polymers and Fibers for Sustainable Roads	• Enhancing Concrete Properties Through Polymers and Fibers for Sustainable Roads	350,000	Academy of Scientific Research	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	5
		Development of Assessment Methods for Asphalt and Asphalt Mixtures to Improve Road Sustainability	-	-	• Development of Assessment Methods for Asphalt and Asphalt Mixtures to Improve Road Sustainability	• Developing Assessment Methods for Asphalt and Asphalt Mixtures to Improve Road Sustainability	650,000	Academy of Scientific Research	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	5

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Country's Trends for Scientific Research 20/30	The Main Research Field	The Secondary Research Field	Research on Academic Degrees		Promotion Research 20%	Applied Research Projects 20%			The Scientific Department	Research Specialization	Priority
			Master's Thesis Topics 40%	Doctoral Dissertation Topics 20%		The Research Project	The Proposed Budget in EGP	Funding Source			
<u>Second:</u> Environmental Dimension, which includes the following axis: • **Environment and Urban Development**	2. **Optimal Utilization of Various Resources and Environmental Safety**	Sustainable Techniques and Environmentally Friendly Materials in Civil Engineering and Construction	• Study of Factors Influencing Performance Levels in Construction Projects • Development and Improvement of Control and Monitoring Methods in Construction Projects • Measurement and Enhancement Studies of Productivity in Construction	• Evaluation and Improvement of Performance in Construction Companies • Evaluation and Improvement of Performance for Infrastructure Networks	• Study and Evaluation of the Environmental Impact of Construction Projects • Evaluation and Improvement of Safety Levels in Construction Projects	• Studies on Performance Improvement in Construction	200,000	The Graduate Studies Fund	Construction and Utilities Engineering	Construction Engineering and Management	1

The Scientific Research Plan for the Department of Construction and Utilities Engineering (2019-2024)

Country's Trends for Scientific Research 20/30	The Main Research Field	The Secondary Research Field	Research on Academic Degrees		Promotion Research 20%	Applied Research Projects 20%			The Scientific Department	Research Specialization	Priority
			Master's Thesis Topics 40%	Doctoral Dissertation Topics 20%		The Research Project	The Proposed Budget in EGP	Funding Source			
			• Requirements for Sustainable Construction	• Development of Smart Construction Systems and Equipment • Development and Enhancement of Construction Material Properties for Higher Performance	• Automation and Monitoring of Construction Works	• Study of Nanotechnology Applications in Various Construction Fields	200,000	The Graduate Studies Fund	Construction and Utilities Engineering	Construction Engineering and Management	2
		Study of the Erosion Rate of Delta Nile Areas	• Utilizing All Survey, Geological, and Groundwater Data to Create a Model for Nile Delta Erosion Rate	-	• Study of the Nile Delta Subsidence Rate	• Establishing a Database Specifically for Nile Delta Erosion	100,000	The Graduate Studies Fund	Construction and Utilities Engineering	Surveying Engineering	1

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Country's Trends for Scientific Research 20/30	The Main Research Field	The Secondary Research Field	Research on Academic Degrees		Promotion Research 20%	Applied Research Projects 20%			The Scientific Department	Research Specialization	Priority
			Master's Thesis Topics 40%	Doctoral Dissertation Topics 20%		The Research Project	The Proposed Budget in EGP	Funding Source			
		Using GPS as a Source of Information for Atmospheric Layers Data	-	• Establishing a Database for the Impact of Atmospheric Layers in Egypt	• Utilization of GPS as a Source of Information for Atmospheric Layers Data • Study on Improving the Accuracy of GPS Usage and Its Alternative Use for Engineering Surveys	-	100,000	The Graduate Studies Fund	Construction and Utilities Engineering	Surveying Engineering	2
		Modern Applications of Transportation Engineering and Traffic and Their Impact on Sustainable Development	-	-	-	• Study on the Environmental Impact of Electric Car Usage	500,000	The Graduate Studies Fund	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	1
		Changing the Travel Patterns and Their Impact on the Environment	-	-	-	• Study on the Environmental Impact of Bicycle Usage for Short Trips	200,000	The Graduate Studies Fund	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	2

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Country's Trends for Scientific Research 20/30	The Main Research Field	The Secondary Research Field	Research on Academic Degrees		Promotion Research 20%	Applied Research Projects 20%			The Scientific Department	Research Specialization	Priority
			Master's Thesis Topics 40%	Doctoral Dissertation Topics 20%		The Research Project	The Proposed Budget in EGP	Funding Source			
		Fuel Quality and Its Impact on the Environment	-	-	-	• Economic Study to Estimate the Suitable Octane Percentage in Gasoline for the Environment of Zagazig City	300,000	The Graduate Studies Fund	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	3
		Sustainable and environmentally friendly techniques and materials in road, airport, and transportation engineering	• Utilization of Cold Asphalt Mixtures	-	-	-	300,000	Academy of Scientific Research	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	4
			• Utilization of Warm Asphalt Mixtures	• Utilization of Warm Asphalt Mixtures	• Evaluation of the Performance of Warm Asphalt Mixtures	• Exploration of Environmentally Friendly Alternatives in the Design and Implementation of Asphalt Roads	250,000	The Graduate Studies Fund	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	5

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			Master's Thesis Topics 40%	Doctoral Dissertation Topics 20%		The Research Project	The Proposed Budget in EGP	Funding Source			
			• Evaluation of the Environmental and Economic Impact of Modern Construction Techniques and Materials	• Evaluation of the Environmental and Economic Impact of Modern Construction Techniques and Materials	• Evaluation of the Environmental and Economic Impact of Modern Construction Techniques and Materials	• Evaluation of the Environmental and Economic Impact of Modern Construction Techniques and Materials	300,000	Academy of Scientific Research	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	6
			• Study of Using Recycled Materials in Road Construction	• Study of Using Recycled Materials in Road Construction	• Evaluation of the Performance of Recycled Materials in Road Construction	• Field Performance Evaluation of Recycled Materials through Field Trials and the Establishment of Experimental Roads	700,000	Academy of Scientific Research	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	7

The Scientific Research Plan for the Department of Construction and Utilities Engineering (2019-2024)

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			Master's Thesis Topics 40%	Doctoral Dissertation Topics 20%		The Research Project	The Proposed Budget in EGP	Funding Source			
Third: Social Dimension, which includes the following axes: • Social Justice, Education, Training, and Culture	3. Solving Contemporary Egyptian Issues	Study of the Subsidence and Erosion Rates of Agricultural Lands in the Nile Delta	• Utilizing All Survey, Geological, and Groundwater Data to Create a Model for the Erosion Rate of the Nile Delta	-	• Study of the Subsidence Rate of Agricultural Lands in the Nile Delta	• Creating a Database Specifically for Nile Delta Land Subsidence	100,000	The Graduate Studies Fund	Construction and Utilities Engineering	Surveying Engineering	1
		Impact of Driving Schools on Traffic Movement Patterns	-	-	-	• Study on the Impact of Driving Schools on Traffic Patterns in Urban Roads	300,000	The Graduate Studies Fund	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	1
	4. Building the Contemporary Egyptian Individual, Starting from Childhood	Application of Driving Skills and Traffic Etiquette in the Basic Education Stage	-	-	-	• Study on the Impact of Teaching Driving Skills and Traffic Etiquette at the Basic Education Stage on Traffic Flow	300,000	The Graduate Studies Fund	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	1

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			Master's Thesis Topics 40%	Doctoral Dissertation Topics 20%		The Research Project	The Proposed Budget in EGP	Funding Source			
		Sustainability and its Applications in Primary, Secondary, and Higher Education Life	• Measuring Students' Response and Comprehension of the Concept of Sustainability	• Measuring Students' Response and Comprehension of the Concept of Sustainability	• Measuring Students' Response and Comprehension of the Concept of Sustainability	• Conducting Workshops to Introduce Sustainability and Measure Students' Response and Comprehension	100,000	The Graduate Studies Fund	Construction and Utilities Engineering	Roads, Transportation, and Traffic Engineering	2