

### **Transportation Engineering and Planning**

1. Roads and Highways
2. Railways, Ports and Airports
3. Infrastructure Networks
4. Service Structures (Bridges, Tunnels, Towers)
5. Urban Transit Planning
6. Travel Demand Analysis

7. Intelligent Transportation Systems (ITS)

### **Construction Management**

8. Project Management
9. Contracting and Specifications

### **Green Buildings**

10. Green Building Materials and Structures
11. Environmental Friendly Irrigation Systems
12. Energy Savings in Buildings

### **Construction Engineering**

13. ICT in Construction
14. Optimization of Construction Site Layout Planning
15. Building Information Modeling (BIM) in Construction Projects

### **Structural Engineering**

16. Advanced Composite Materials
17. New Techniques for Non-Destructive Tests (NDT)
18. Finite Element Modeling (FEM)
19. Structural Health Monitoring (SHM)
20. Nano-Fibers in Structures

### **Coastal Zone Management and Water Management**

21. Integrated Water Resources Management and Sustainability
22. Coastal Resilience and Integrated Coastal Zone Management
23. Impact of Climate Change and Sea Level Rise on Coastal Zones

### **Geotechnical Engineering**

24. Soil Stabilization and Remediation
25. Numerical Modeling of Soil Behavior
26. Physical Modeling of Deep Foundations
27. Soil Dynamics and Liquefaction

### **Automation and Control**

28. Automated Systems Modeling and Control
29. Motion Control of Wheeled Platforms
30. Fault Tolerance Control
31. Dynamic Safety Margins on Process Control

### **Electrical Machine Drives**

32. Harmonic Distortion Improvement for Electrical Drives
33. Power Electronics Applications on Special Machines
34. Electrical Machine Design
35. Uninterruptible Power Supplies

### **Electrical Power Engineering**

36. Power Quality Improvement Using AI Techniques
37. Power Systems Protections and Operation
38. Wind and Solar Energy Resource Management
39. Voltage Regulation on Electrical Transmission Lines
40. Flexible AC Transmission Systems (FACTS) and High Voltage DC

### **Marine Engineering**

41. Ship Design (Hydrodynamic, Stability, Powering)
42. Computational Fluid Dynamics (CFD) in Marine Applications
43. Advanced Marine Vehicles (Hydrofoils, WIG's, SES, ...)
44. Fluid-Structure-Interaction (Marine Applications)
45. Ship Production Technologies
46. Marine Turbines and Energy Extractors

47. Computational Methods in Harbor Engineering
48. Marine Propulsion Systems
49. Dynamic Positioning
50. Marine Renewable Energy
51. Marine Environment

### **Offshore Engineering**

52. Offshore Technology (Floating Platforms, Anchoring and Mooring Computations)
53. Offshore Wind Energy
54. Pipeline and Riser Technology (Design, Analysis, Installation, Pipe Soil Interaction, Flexible Pipes)
55. Drilling, Production, Construction, Oil and Gas Reservoir Engineering
56. Modeling and Analysis for Offshore Structures
57. Conventional and Unconventional Offshore Gas Production Facilities: Floating LNG, CNG, Gas Hydrates
58. Subsea Production & Piping Systems

### **Computer Engineering**

59. Cloud Computing and Software Engineering
60. Data Communication and Network Security
61. Embedded Systems, Reconfigurable Computing & Computer Arch.
62. Intelligent Systems, Data Mining and Machine Learning
63. Bioinformatics
64. Cryptography
65. Cryptographic Engineering

### **Manufacturing Systems and Processes**

66. Rapid Prototyping Applications
67. Product Development Systems
68. Lean Manufacturing Systems

### **Modeling and Simulation**

69. Component Based Modeling of Industrial Systems
70. Optimization of Industrial Facilities Design
71. Meta-Heuristic Optimization

### **Materials Engineering**

72. Materials Microstructure in Nano-Engineering
73. Use of Materials in Renewable Energy Applications
74. Industrial Materials Waste Treatment

### **Human Factors Engineering**

75. Occupational Health and Safety
76. Ergonomically Designed Products
77. Risk Assessment, Analysis, and Management
78. Robust and Reliability-Based Engineering

### **National Urban Planning**

79. Urban Distribution and Dispersal
80. Airports and Railway Stations
81. Marine Transportation

### **Regional Urban Planning**

82. Country's Regions
83. Regional Road Networks
84. Regional Urban Development

### **City Planning**

85. Master Plan of Alexandria
86. Land Use, Urban Fabric, Housing and Utilities
87. City Gateways and Axes
88. Water Surfaces and Corridors
89. Ring Roads, Green Back and Green Belt

### **Architectural Design**

90. Informal Housing
91. Conservation Methods for Heritage Buildings
92. Modern Housing and New Approaches in Architecture

### **Thermal Engineering**

93. Air-Conditioning Systems Using Solar Energy
94. Natural Gas Refrigeration Systems
95. LPG Production from Natural Gas
96. Liquefaction of N.G. System

### **Hydraulic Systems**

97. Reduction of Friction Losses in Pipelines
98. Pump Performance Analysis
99. Nano-Actuators in Hydraulic Circuit Valves

100. Fluid Simulation of Two-Phase Flow

### **Automotive Engineering**

101. Car Pollution Control

102. Hybrid Car Systems

### **Renewable Energy**

103. Energy Generation From Renewable Energy Sources
104. Water Desalination Using Solar Energy
105. Heater Using Solar Thermal Collectors
106. Power Generation in Remote Isolated Areas
107. Efficiency of Photo-Voltaic Cells
108. Wind Energy for Power Generation
109. Energy Storage Systems

### **Electronics and Communications Department**

110. Sensors Applications and Fabrications
111. Wireless Sensor Network
112. Measurements and Instrumentations Techniques
113. Photonic Devices (Optoelectronics)
114. Genetic Algorithms and Swarm Intelligence
115. Neural Network Applications
116. Fuzzy Systems Applications

### **Electronics Devices and Circuits**

117. Integrated Circuit Fabrication
118. VLSI Circuits ( Analog & Digital )
119. Low-Power Design
120. RF Integrated Circuits
121. Photovoltaic Devices and Systems
122. Process and Device Modeling

### **Digital Signal Processing**

123. Pattern Recognition
124. Image and Video Processing
125. Computer Vision
126. Biomedical Applications
127. Biometrics
128. Signal Processing Applications
129. Watermarking

### **Digital and Mobile Communications**

130. Mobile Communications
131. Wireless Communications
132. Cognitive Radio
133. Optical Communications

### **Microwave Technology**

134. Smart Antennas
135. Micro-Strip Antennas
136. Electromagnetic Scattering Problems
137. Computational Electromagnetic
138. Nano-Analysis Microwaves Filter

### **Nanotechnology**

- 139. Single electron transistor
- 140. Ballistic transistor
- 141. Nano-gold particles for medical treatment

### **Engineering Mathematics**

- 142. Mathematical models of hydrodynamic, aerodynamics
- 143. Mechanics of materials and elastic bodies
- 144. Computational techniques and stochastic models
- 145. Mathematical & statistical models in finance & economics

### **Engineering Physics**

- 146. Radiological effect on environment
- 147. Environmental indicators and climatic change

### **Applied Chemistry**

- 148. Corrosion engineering and protection
- 149. Mass transfer and electrochemical reactors
- 150. Large scale storage batteries
- 151. Wastewater treatment

### **Design, Vibration, and Control**

- 152. Modeling and simulation of dynamic systems
- 153. Vibration isolation
- 154. Dynamics and control of robotic systems
- 155. Control of mechanical and mechatronics systems
- 156. Smart materials

### **Heat Transfer**

- 157. CFD applications
- 158. Heat and mass transfer