الجامعة المصرية اليابانية للعلوم والتكنولوجيا
エジプト日本科学技術大学
EGYPT-JAPAN UNIVERSITY OF SCIENCE AND TECHNOLOGY

جامعـة مـصريـة بحثيـة حكوميـة
ذات شراكة يابانية وطبيعة خاصة

Faculty of Engineering and Basic and Applied Sciences Graduate Programs Admission Guidelines for Fall 2021 – International Admission

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Awarded Degree:

Egypt-Japan University of Science and Technology offers opportunities of advanced study and academic research to Graduate students. The programs involve Master's and Doctoral courses leading to the corresponding degrees (M.Sc. and Ph.D.).

Accepted applicants to the programs will be enrolled in the next fall 2021 semester, which will begin on September 26, 2021. Lectures and instructions for research are given generally in English.

Study Duration:

The maximum period to complete the Master program study and obtain the MSc degree is three academic years. However, the student can be graduated and obtain the MSc degree after two years from the enrollment if he/she can finish all the graduation requirements in these two years.

The maximum period to complete the PhD program study and obtain the PhD degree is five academic years. However, the student can graduate and obtain the PhD degree after three years from the enrollment if he/she can finish all the graduation requirements in this period.

The scholarship's term is the period necessary to complete the degree requirements in E-JUST, which should be two years for the M.Sc. degree preceded by 6 months for preparatory courses (if necessary).

For the PhD degree the scholarship term is three years preceded by 6 months for preparatory courses (if necessary).

Preparatory Course

The objectives of the preparatory courses are:

- To cover the deficiencies of E-JUST PG applicants in the basic research skills, English languages, computer programming, statistics and liberal arts.
- To prepare E-JUST PG students to the required nature of PG study in E-JUST including Japanese culture, Japanese language, Arabic language for international students, Research and Publications ethic and method.
- To make the PG students familiar with E-JUST labs, center of excellences and professors before registering the point of research and before the formation of the supervision committee. This will help the student in the proper selection of the research point and supervision committee.

Admission Requirements:

	Condition	Requirements
1	Educational Background and Records	**For Faculty of Engineering (FOE) Programs** • <u>FOE M.Sc. applicants:</u> should hold a Bachelor degree in engineering with CGPA ≥ 3 out of 4 / Description ≥ very good/ classification ≥ second class upper or equivalent to the mentioned before. • <u>FOE PhD applicants:</u> should have M.Sc. (thesis-based) degrees in engineering, related to his proposed research topic, with a distinguished academic record in the related undergraduate program's major. **For Basic and Applied Sciences (BAS) Programs** • <u>BAS M.Sc. applicants:</u> should hold a Bachelor degree in Science in the field of specialization with a CGPA ≥ 3 out of 4 / Description ≥ very good/ classification ≥ second class upper or equivalent to the mentioned before. • <u>BAS PhD applicants:</u> should have M.Sc. (thesis-based) degrees in Science, related to his proposed research topic, with a distinguished academic record in the related undergraduate program's major. <u>The student's academic background should match the academic requirements of the program he/she is applying for (Please refer to academic background tables).</u>
2	Language (English) Proficiency	Admission Requirement: TOEFL iBT 79 or Academic IELTS: 6.5. • The Language certificate should be valid on the date of the application submission. • **<u>Applicants whose native language is English are not required to submit official evidence of English Language Proficiency.</u>**
3	Admission Examination- Personal and Academic Interview:	Applicants must pass successfully the personal and academic interview • Applicant minimum acceptance percentage of is 60% at the interview • Interview (Personal and Academic) • Oral Examination
4	Equivalency Certificate and Security Clearance:	According to the Egyptian Ministry of Higher Education regulations for accepting foreign students (Non-Egyptian), the student must acquire the following: • <u>Equivalency Certificate</u> from the Egyptian Supreme Council of Universities (SCU). • <u>Security clearance</u> from Ministry of Interior Affairs. E-JUST applies on behalf of the applicants who pass successfully the admission interview and oral examination for the equivalency certificate and security clearance. However, failing to acquire any of the said documents, will lead to termination of the application.

Academic Background for Engineering Programs:

Program	Academic Background
Electronics and Communications Engineering (ECE)	The students' academic background should be: Electronics and Communications Engineering.
Electrical Power Engineering (EPE)	The students' academic background should be: Electrical Power Engineering.
Computer Science and Engineering (CSE)	The students' academic background should be: Engineering Degree in Computer Science and Engineering
Chemicals and Petrochemicals Engineering (CPE)	The students' academic background should be: Chemical and Petrochemicals Engineering, Material Science and Engineering, Mechanical Engineering and Metallurgy, other related disciplines
Mechatronics and Robotics Engineering (MTR)	The students' academic background should be: Mechatronics and Robotics, Computers and Automatic control, Power Electronics, Mechanical Engineering, Production Engineering and Mechanical Design. Students are expected to have good knowledge of Control Engineering, Electronics and Programming.
Industrial Engineering and Systems Management	The students' academic background should be: Industrial Engineering, Production Engineering, Manufacturing Engineering, Mechanical Engineering, and Mechanical Design Engineering.
Materials Science and Engineering (MSE)	The students' academic background should be: Metallurgy, Materials Science and Engineering, Mechanical Engineering, Production Engineering, Chemical Engineering, Textile Engineering, Nuclear Engineering, Electrical Engineering, Civil Engineering, other related Engineering discipline
Energy Resources Engineering (ERE)	The students' academic background should be: Mechanical Power Engineering, Energy Engineering, and Chemical Engineering.
Environmental Engineering (ENV)	The students' academic background should be: Chemical, Architecture, Electrical, Mechanical, Nuclear, Civil, Environmental Engineering, and other related disciplines.
Chemicals and Petrochemicals Engineering (CPE)	The students' academic background should be: Chemical and Petrochemicals Engineering, Material Science and Engineering, Mechanical Engineering and Metallurgy, other related disciplines

Academic Background for Basic and Applied Science Programs:

Program	Academic Background
Nanoscience (NAN)	The students' academic background should be: Science background with specialization in Special Chemistry, Chemistry major with any other subject (minor), Materials Science, Biochemistry, and Other related fields.
Biotechnology (BIO)	The students' academic background should be: Science, Computer Science or Pharmaceutical sciences. Fields of specialization should be: Biotechnology, Microbiology, Biochemistry, any field of Pharmaceutical Sciences, Bioinformatics (Science or Computer Science), or any field of Biological Sciences including botany, Zoology, Entomology.
Applied and Computational Mathematics (ACM)	The students' academic background should be: Science background with specialization in Mathematics, Engineering with Mathematics background, Other related fields
Energy Materials (EMA)	The students' academic background should be: Science background with specialization in: Special Physics, Physics-major and Chemistry-minor, Materials Science, Energy Materials for Space Applications, Other related fields
Space Environment (SEN)	The students' academic background should be: Science/ Computer Science , Graduates holding BSc or MSc degree from any Faculty/ Institute in one of the following fields of specialization: Physics, Space Science, Astrophysics, Astronomy, Navigation Science, Space Technology, Environmental Science, Meteorology, Geophysics, Remote Sensing

Selection Procedures / Dates and deadline:

Application Submission

➢ Online submission is opened through E-JUST website from December 31 till February 13, 2021. www.ejust.edu.eg

➢ The applicant should complete the application before the deadline and attach all the required documents.

Primary Screening Announcement

➢ E-JUST will send the result to each applicant after documents classification and analysis on March 11, 2021, the accepted applicants will be invited to the interview.

Interview and Exams

➢ The exam and interview will be held by video conference via Skype (requires good internet connection) on March 21 -25, 2021.

Result announcement

➢ E-JUST will announce the final decision to the applicants on April 29, 2021.

Deadline to receive all the original certificates certified by the Egyptian Embassy

➢ Accepted applicants have to submit their documents to E-JUST international office. All the certificates must be certified by the Egyptian embassy from applicants' home country.

Further details on the required documents and the certifications will be announced to the accepted applicants on May 31, 2021.

Arrival in E-JUST

➢ Accepted applicants should arrive at E-JUST maximum by September 17, 2021.

*This date is subject to change according to the admission process.

Medical Check up

➢ Students have to be tested for HIV examination in governmental hospital in Egypt and in case of positivity of the result the applicant will be forced to leave Egypt according to the Egyptian law.

Orientation Week

➢ Introducing E-JUST research and campus life to the students.

	Process	Due Date
1	Application Submission	December 31, 2020 – February 13, 2021
2	Primary Screening Announcement	March 11, 2021
3	Interview and exams	March 21-25, 2021
4	Result announcement	April 29, 2021

	Process	Due Date
5	Deadline to receive all the original certificates certified by the Egyptian Embassy	May 31, 2021
6	Arrival in E-JUST	September 17, 2021
7	Medical Check up	September 18/19, 2021
8	Orientation week	September 20- 23, 2021
9	Start of lectures Spring 2021 Semester	September 26, 2021

* Note: Reasons for disqualification in any stage of selection procedure will <u>**NOT**</u> be disclosed

Schedule subject to change

Admission Examination (Personal and Academic Interview):

Personal Interview and Research Proposal Presentation Assessment Criteria

1. Oral Examination
   - ➢ Knowledge of basics principles in the field
2. Interview
   - ➢ Research ability and potential
     - Potential for conducting independent experiments/surveys
     - Research ability and potential
     - Potential for conducting independent experiments/surveys
   - ➢ Presentation skills
     - Originality of the presentation (Percentage taken from web sites, borrowed material)
     - Logic and clearness to expose ideas (looking to audience)
     - Answering questions logic, and consistently
     - Clear and concise spoken English
   - ➢ Personal Character
     - Motivation and neatness
   - ➢ Awards and publication, others

The candidate conducts a 15-minute presentation by PPT (Power Point Presentation) for his/her research proposal in front of an evaluation committee. The presentation is followed by 15-minute discussion with the candidate to evaluate the main points given in the research proposal and to evaluate the candidate's research potential.

Applicants are required to provide a copy of the research proposal attached to his/her application and the power-point presentation before their interview date.

Faculty of Engineering Research Areas and Topics

Electronics and Communications Engineering (ECE)

Radio Frequency Integrated Circuits and Systems
- Development of integrated circuits for wireless power transfer systems
- Development of low phase noise CMOS oscillators for millimeter wave applications
- Sensors electronics
- Radio frequency transceivers design
- RF-CMOS Front-end (LNA, PA, Mixer, VCO, VGA)

Digital System Architecture and Design
- Application specific, reconfigurable, and embedded architectures
- Networks-on-Chip, Network processor and router architectures
- System-on-Chips
- Parallel and multi-core systems
- Ultra low power and energy efficient architecture design
- High Performance Computing/Processing Systems
- Security Architectures/Secure Design of Embedded Systems
- Neuromorphic computing
- High Efficiency Video Coding (HEVC/H.265)
- Embedded Machine Vision Systems
- Wireless Body Area Networks

Digital Signal Processing
- Image and Video Processing
- Speech and Audio processing
- Multi-dimension Signal Processing and Stochastic Processes
- Multimedia Systems
- Pattern Recognition
- Computer Vision and Image Analysis
- Adaptive Filtering Design
- Sparse Signal Processing and Applications
- Compressive sensing
- Bioinformatics
- Biomedical Signal Processing

Wireless Communication Systems
- 5G and B5G Communication System
- Broadband Wireless Systems
- PHY Layer Design

- Coding for Communication Systems

- Cognitive and Software-Defined Radio

- PHY Layer Security

- Wireless-Optical Communications

- Machine learning for wireless communications

- Quantum Communications

Photonics Communications Systems
- Silicon Photonics and Photonic Crystals

- Visible-Light Communications (VLC)

- Free-Space Optics (FSO)

- Digital Signal Processing for Optical Communications

- Optical Space-Division Multiplexing (SDM).

- Coherent Light wave Systems

- Quantum Information Theory

Microwave Engineering and Remote Sensing
- Wireless Power Transfer Systems

- Nano- Antennas and Passive Devices

- Antenna and Resonators for Imaging Technologies

- Microwave and 60GHz mm Wave Antennas and Circuits

- Antenna and Resonators for IOT Applications

- Energy harvesting for Implantable and wearable devices

- Diagnostic and therapeutic Electromagnetic Applications

- Smart Antennas and Adaptive Antenna Arrays

- Antennas Design for Medical Applications

- Antenna for Imaging Technologies

- Antenna System for 5G Communication

- Frequency and Time Domain Technologies for Antenna and Microwave Devices

- Reconfigurable Antennas and Arrays

- Novel Electromagnetic Materials

- Remote Sensing and Satellite Observation

Electrical Power Engineering (EPE)

Power System Planning, Operation and Control

- Power system stability
- Power system reliability
- Power system flexibility
- Power system resilience
- Power system security
- Flexible alternating current transmission systems (FACTS) applied to power systems
- Application of optimization methods to power systems
- Power system protection
- Monitoring and online diagnosis
- Control and Measurements of Power Systems

Networks for Renewable Generation

- Renewable Energy Technologies
- Distributed Generation and Hybrid Energy Systems
- Micro grids and active distribution networks
- Virtual power plants and demand response
- Security assessment and risk analysis in renewable energy
- Assessment and the impacts of high penetration of renewable energy
- System side technologies/controls for renewable energy integration
- Demand side technologies/controls for renewable energy integration
- Grid modeling, simulation, and data management
- Energy Management Systems
- Wide Area Protection, Communication, and Control in Energy Systems

Smart Grid

- New Trends and Technologies for Smart Grid
- Policies and Strategies for Smart Grid
- Novel energy conversion studies in smart grid systems
- Microgrids for transportation electrification
- Power Devices and Driving Circuits for Smart Grid
- Decision Support Systems for Smart Grid
- ICT, IoT, Real-time monitoring and control
- Smart metering, measurement, instrumentation, and control
- Impact of Smart Grid on Distributed Energy Resources
- Self-healing
- Energy storage technologies and systems

- Smart homes, cities, communities
- Smart energy grid education

Energy Markets
- Market structure and operation
- Transmission cost/loss allocation
- Congestion management
- Pricing of energy and ancillary services
- Impact of renewable energy integration on Energy market operation

Energy Storage
- Modelling aspects of energy storage systems
- Control and planning of centralized and distributed energy storage
- Grid Scale energy storage
- Management and control of large number of distributed small storage, V2G and similar

Power electronics and machine drives
- Electrical machines analysis and design
- Solid-state control of electric machine drives
- Power electronics converters
- Power electronics for renewable energy systems

Computer Science and Engineering (CSE)

Computer Architecture

- High Performance Architectures
- Matrix/Vector Processing
- Processor Architecture
- Performance Evaluation of Parallel Architectures
- Multi-core/Many-core Processors
- Hardware Visualization
- FPGA/System C Implementation

Computer Networks

- Cloud Computing
- Wireless Networks
- Delay-tolerant Networks
- Internet of Things (IoT)
- Interconnected Vehicles
- Vehicular Ad-Hoc Networks
- Cellar Networks and 5G and Beyond
- Cloud/Centralized Radio Access Network (C-RAN)
- Fog/Edge Computing
- Indoor Localization
- Calibration-free localization
- GPS Replacement Technologies
- Device-free Localization
- Device-free Activity Recognition
- Automatic Construction of Indoor Floor Plans
- Cognitive Radio Networks
- Software-defined Networks

Computer Security and Cryptography

- Network Security
- Information Security and Cryptography
- Computer Security
- Wireless Network Security
- IoT Security
- Vehicular Network Security
- Smart City Security
- Cloud Security

- Cyber Security
- Homomorphic Encryption

Parallel Computing
- High Performance Computing
- Heterogeneous Systems/Accelerators
- HPC on the Cloud
- High Performance Embedded Systems
- Big Data Processing and Knowledge Discovery from Data
- Parallelizing Compilers
- Dynamic Binary Translation
- Analytical Performance Modelling
- Quantum Computing
- Neuro-Processing Acceleration

Cyber-Physical Systems
- Machine Learning
- Computer-Aided Drug Design
- Road Traffic Control, Modeling, and Simulation
- Computational Robotics
- Human Activity Recognition
- Rigorous Simulation of Dynamical Systems
- Computable Analysis

Intelligent Systems
- Knowledge Discovery and Data Mining
- AI and Multi-Agent Systems
- Natural Language Understanding
- Computational Intelligence
- Bioinformatics
- Deep Learning

Computer Vision and Pattern Recognition
- Object/Person/Face Detection
- Object/Face Recognition
- Object/People Tracking
- Human Activity Recognition
- Optical Character Recognition
- Image Segmentation

- 3D Computer Vision
- Feature Detection/Description/Matching
- Video Surveillance
- Large-Scale Visual Recognition
- Vision Computing on Modern Parallel Architectures

Theory and Analysis of Algorithms
- Analysis of Algorithms
- Data Structures
- Graph Algorithms
- Computational Geometry
- Amortized Complexity
- Algorithms for Computer Graphics and Visualization

Stochastic Modeling and Simulation
- Queuing Theory
- Stochastic Optimization
- Performance Evaluation
- Health Care Applications

Mechatronics and Robotics Engineering (MTR)

Bio-Mechatronic Systems

- Surgical Robots
- Rehabilitation Robots and Assistive Devices
- Autonomous assistive robotic systems for tasks around the head
- Human-Robot Interaction
- Prosthetic Devices
- Smart Medical Devices
- Bio-Inspired Robots

Magnetic Suspension and Bearing Systems

- Control of Magnetic Bearing Systems
- Applications of Magnetic Bearing in Medical Field
- Magnetically Levitated Wind Turbine
- Robots with Magnetic Bearing Joints
- Vibration Isolation Systems Using Magnetic Suspension
- Self-Bearing (Bearingless) Motors.

Intelligent Mechatronics Systems

- Flying/Walking Robot.
- Tele-Operation Systems.
- Aerial Manipulation Systems
- Multi-Locomotion Robots
- Legged Robots
- Wearable Vehicle
- Brain-Based Devices
- Micro/Nano Manipulation
- Parallel Manipulators
- Swarm Robots
- Intelligent control of Smart Actuators
- Nonlinear Vibration Systems
- Smart Structures

Field and Service Robots

- Mobile Robot Exploration, Navigation and Control
- Rescue Robots
- Inspection Robot
- Climbing Robots
- Robot Motion Control in Unstructured Area

- Landmines Detection Robots
- Indoor Service Robot.
- Insect-Killing Robot
- Solar Powered Rover
- Autonomous Underwater Vehicles, AUV
- Agriculture Robots
- Mining Robots
- Forestry Robots
- Construction Robots

Micro/Nano Electro-Mechanical Systems
- Tactile Sensing Systems
- Smart Sensor/ Actuators
- Energy Harvesting Devices
- Micro Flying Robot
- Microfluidics Systems

Industrial Engineering and Systems Management

Applied Operations Research Laboratory
- Production planning and analysis
- Job shop scheduling and Line balancing
- Master production scheduling
- Aggregate planning
- Inventory planning and management
- Agriculture 4.0 application for strategic African crops

Supply Chain Management and Applications
- Green Vehicle Routing Problem/Pollution Routing Problem
- Ride Hailing/Sharing Models
- The Joint Replenishment Problem and supply chain coordination

Conventional Machining Laboratory
- Modelling and Simulation of Metal Cutting Processes.
- Ultrasonic-Assisted Machining (Milling or Drilling).
- Machining of Hard-to-Cut Materials (Milling or Drilling)
- Dynamic Interaction between Feed Drive Systems and Cutting Process in Milling Machines.

Machine-Tool / Cutting Process Interaction
- Multi-Directional Ultrasonic-Assisted Milling of Hard-to-Cut Materials.
- Chatter Occurrence and Prevention in Milling of Thin-Walled Parts.
- Machine-Tool / Milling Process Interaction.

Materials Science and Engineering (MSE)

Nano-materials for energy, sensing, environmental and electronic applications

- Perovskite, CTS, Organic and Quantum Dot Photovoltaic Solar Cells: Fundamental Investigation & Device Engineering.
- Nanomaterials for Gas Sensing Applications; Fundamental Investigation& Device Engineering.
- Carbon Nanostructured Materials (Graphene, Carbon Nanofibers and CNTs): Synthesis, Characterization and Device Engineering in Supercacitors/Batteries/Fuel Cells applications.
- Nano-Piezo Electronic Materials: Approaches to Energy Scavenging.
- Strain Gauge Sensors: Materials and Fabrications.
- Thin Film and Bulk Nanostructured Thermoelectric Materials.
- Plasmonic Nanostructuted Materials as Photo-thermal Membranes.
- CNTs and Graphene-Based Materials for printed and Flexible Electronic Application.
- Photo catalysis and Environmental Catalysis for Hydrogen Generation and Fisher Tropcsh Synthesis.
- Modeling and Simulation of Nanostructured Materials for Science and Energy Systems.
- Corrosion and Super-hydrophobic Coatings with Self-heating Properties.
- Chitosan, Chitosan-Nanoparticles and Nanofibers Preparation and Characterization For Tissue Engineering And Drug Systems
- Electro spun Nanofibers and Its Applications in Water Desalination and Energy
- Materials of Solar Water Desalination
- Materials of Solar Hydrogen Generation

Mechanics of materials: Modeling, Simulation and characterization (properties, stress, strain and displacement)

- Mechanics of Friction Stir Welding of Similar and Dissimilar Materials
- Mechanical Electrical Properties of Biological Materials and Heart Tissues
- Mechanics of Microforming and Micro-Laser Drilling
- Mechanical and Electrical Properties of Hydroxyapatite
- Modeling and Simulation of Nano-Pieso Electric Materials
- Multi-Physics and Multi-Scale Analysis Techniques.
- Evolution of Boundary Elements in Fracture Mechanics
- Material Models On Macro and Micro Levels for Metals, Polymer and Nanocomposites
- Dynamic Mechanical Properties of Composites and Nano-Composites
- Laser Processing of Steels

- Hot Deformation of Metal Matrix Composites
- Formability of Ultrafine-Grained Structures
- Mechanical Processing of New TWIP Stainless Steels
- Evaluation of The Fatigue Performance of New High Strength Materials For Structural Engineering Applications
- Superplastic Forming
- Stir Casting of Metal Matrix Composites
- Laser Welding Similar and Dissimilar Materials
- Crashworthiness of High Strength Steels, Modelling and Simulation, Experiments
- Properties of Advanced Materials for Thermal Memory
- Hydroxyapatite: Preparation, Properties and Its Applications

<AFMM>Advanced Functional Metallic Materials (Design, Processing and Characterization)
- Ultra-High Strength, Super-Alloys and High Entropy Alloys
- Dental, Bio-Implants, And Bio-Degradable Metallic Materials
- Bulk-Nanostructure Materials and Severe Plastic Deformation
- Improved Castability and Cold Workability of Metals and Alloys
- Shape Memory and Superelastic Alloys for Sensing, Biomedical, And Structural Application
- Metal and Metal-Oxides Nano-Tubes and Nano-Rods (Production, Characterization and Applications
- Structural High Temperature Alloys for Power Plants Applications (Design, Production and Characterization)
- Bulk-Nanostructured Thermo-Electric Alloys
- Metals and Alloys for Radiation Sensing And Shielding
- High Temperature Superconductors

Materials for environmental and biomedical applications
- Free standing carbon-based membranes for water treatment and desalination
- High performance patterned polymeric membranes for water treatment and desalination
- 2D material-based membranes for wastewater treatment and desalination
- 3D polymeric nanocomposites for efficient separation of oil/water mixtures and nanoemulsions
- Silk-based nanocomposites for electronic, optoelectronic, drug delivery and environmental applications
- Electrospun nanofibrous scaffolds for bone generation, cell growth control and cancer therapy

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- 3D printed lab-on-chip devices for water analysis, oil removal, virus detection and biosensors
- Bioink formulation and 3d printing of materials and devices for personalized medicine applications
- Hybrid graphene/TMDs nanocomposites for water treatment, energy storage and IoT applications
- Antiviral polymeric filaments for 3D prototyping and manufacturing of personal protection kits

Polymeric and Composites materials
- Nanofiber formation technologies (electrospinning, solution blown, centrifugal spinning) and its applications (medical, energy, filtration…etc)
- Sustainable or green composites for industrial applications
- Lignocellulosic materials for engineering application
- Natural fiber for industrial application
- Nonwoven fabrics for technical applications phd
- Fiber Reinforced Polymers (FRP)
- Wearable and smart textile materials and its applications
- 3D fibrous composites materials
- Improving UV resistance of polymeric materials

Energy Resources Engineering (ERE)

Alternative Energy Systems

- Concentrator Photovoltaic (CPV/T) systems-Design and fabrication-Performance analysis
- Thermal regulation of Concentrator Photovoltaic (CPV/T) systems using Nanotechnology
- Hybrid Concentrator Photovoltaic/Thermoelectric power generator (CPV/TEG/T)- Design and performance evaluation- Modeling & Experiments
- Wind turbine aerodynamics - Modeling & Experiments
- Fuel Cell Technology (PEMFCs, DMFCs, and SOFCs)- Modeling & Experiments
- Solar Hydrogen production via Photoelectrochemical cells or Concentrator Photovoltaic/ Photoelectrochemical cells - Modeling & Experiments
- Thermal Hydraulic of nuclear reactors- Modeling & Experiments
- Geothermal energy in industrial applications- Modeling & Experiments
- Integrated Concentrated Solar Power (CSP)- desalination systems- Modeling & Experiments

Fluid Science and Engineering Laboratory

- Computational Fluid Dynamics and Heat Transfer
- Micro-and Nano scale flows- Modeling, simulation, and Experimentation
- Flow in porous media- Modeling, Simulation, and Experimentation
- Complex fluids-Modeling & simulation
- Spray systems - Design and characterization- Modeling, Simulation, and Experimentation
- Multi-phase flows- Modeling, simulation, and Experimentation
- Multiscale Computations (Continuum-Meso), Molecular Dynamic Simulation
- Blood flow- Modeling, simulation, Experimentation
- Respiratory system- Modeling, Simulation, and Experimentation

Thermal Energy Systems Laboratory

- Solar-driven adsorption cooling systems
- Solar-driven multigeneration systems
- Hybrid adsorption desalination-cooling systems
- Thermally driven desalination systems
- Desiccant cooling systems
- Renewable energy-based hybrid adsorption-vapor compression refrigeration systems
- Hybrid absorption systems
- Thermal energy storage
- Refrigeration and air conditioning

- Solar energy utilization in water harvesting from atmospheric air
- Solar systems for energy-efficient housing
- Heat and mass transfer with applications to energy systems

Renewable Energy Systems
- Design of solar energy system
- Thermoelectric System
- Renewable energy- driven seawater desalination
- Solar systems for energy-efficient housing
- Renewable energy systems
- Energy applications in buildings
- Thermal energy storage application in energy system
- Heat Pipe
- Heat and mass Transfer
- Thermochemical energy storage
- Solar cells
- Wind Energy
- Renewable energy resources

Fuel and Combustion Engines
- Performance of Compression Ignition Engines
- Alternative, Cleaner and Low-Grade Fuels
- Morphology and Nanostructure of soot
- Nanoparticles Synthesis using CI engines and Flames
- Biomass Gasification and Carbonization
- Integrated Combustion-Renewable Energy systems
- Gas-to-liquid (GTL)
- Spray and Liquid Atomization
- Droplet Heating and Evaporation

Environmental Engineering (ENV)

Waste Treatment and Management

- Wastewater Treatment Technologies
- Industrial Waste Treatment and Management
- Biofuels, chemicals and bio-fertilizers production from solid wastes
- Hydrogen and Methane Generation from Waste Materials
- Waste Recycling and Management
- Applications of Nanotechnologies for Water and Wastewater Treatment
- Sludge Treatment
- Advanced Oxidation Processes
- Application of water chemistry and microbiology for treatment of organic and inorganic pollutant
- Sustainability and sustainable development
- Environmental impact assessment
- Sustainable cities
- In-plant Control
- Cleaner Production
- Climate change Related to SDGs 2030
- Policy, strategy, control and management aspects of water quality.

Natural Resources Management

- Hydrological Modelling and Integrated Watershed Modeling (including sediment transport, storm analysis)
- Hydraulic Modelling and Simulation (physical, mathematical and numerical)
- Hydrology of Arid and Semi-Arid Regions (incl. groundwater)
- Integrated Water Resources Management (IWRM)
- Coastal Engineering (incl. sediment transport, ecosystem conservation)
- River Basin Engineering
- Nonconventional Water Resources (desalination, water reuse …etc.)
- Irrigation and Drainage Engineering Studies
- Optimization of Water Resources Conjunctive Use
- Water Quality And Health Risk Assessment
- Climate Change Impact Assessment (Water Cycle)
- Applications of Remote Sensing and GIS In Water Resources and Sewer Systems
- Sustainability of Water Supply Systems.
- Natural Resources Mapping and Assessment using Remote Sensing and GIS Technologies

- Sustainable ecosystem management

Air Quality Laboratory
- Air Pollution Assessment and Control
- Climate Change and Sustainability (Greenhouse Effect)
- Indoor Air Quality Improvement Techniques
- Assessment of Emissions from Industries and Minimization Techniques
- Implementation of Nanotechnology for Pollution Control and Detection
- Sensors and Detectors Technology

Environmental Assessment and Management Laboratory
- Environmental Management for Sustaining a Green Environment
- Sustainable buildings and cities
- Greening the Built Environment
- Passive architecture and urban environment
- Building energy efficiency
- Impact of climate change on the design of energy efficient buildings
- Adapting urban planning for climate change
- Thermal mitigation effects of urban vegetation
- Natural ventilation efficiency of houses by using computational techniques
- Remote sensing and its applications in urban planning.
- Satellite images analysis to assess the surface thermal distribution in urban areas.
- Building materials for hot and humid climate

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Chemicals and Petrochemicals Engineering (CPE)

Desalination using solar Energy

- Design of new solar collectors using nanofluids and its applications in water desalination
- Desalination Using Capacitive Deionization Techniques.

Design of wastewater treatment units and its applications

- Advanced Oxidation Techniques such as Plasma for Water Purification.
- Photocatalysis and its applications in water treatment
- Using New materials as ion exchange for water treatment
- Preparation of New electrodes and it applications for wastewater treatment by electrooxidation techniques.

Preparation of Nano-materials and its applications

- Ion exchange
- Electrocatalysis
- Fuel cells

Corrosion Protection

- Preparation of New Smart Materials and its applications for corrosion control

Catalysis and its applications

- Photocataysis and its applications in wastewater treatment, Production of new chemical and petrochemical materials.
- Electrocatalysis and its Applications in Supercapacitors, Batteries, Sensors and Biosensors.
- Enzyme-catalysis and its applications in wastewater treatment, production of foodstuffs and pharmaceutical materials.

Membrane fabrication and modifications and its applications in

- Desalination and Ultrafiltration processes.
- Fuel cells and Hydrogen production
- Separation processes.

Design of Micro-reactor and its applications such as:

- Preparation of fine chemicals, food stuffs and pharmaceutical drugs, etc.

Development of new polymeric materials:

- Composites, insulators, fibrous materials and conducting polymers, etc.

Biodiesel production from agricultural and oil wastes.

- Chemical and Petrochemicals operations development and performance improvement
- Distillation, liquid extraction, gas absorption, crystallization, adsorption, and many other separation techniques performance and productivity improvement

Basic and Applied Science Institute Research Areas

Nanoscience Program (Nano)

- Carbon-Based Nanostructures (Carbon Nanofibers, CNTs, Graphene, etc.) Materials for Energy Generation, Conversion and Storage (Photo-Hydrogen Generation, Supercapacitors, Batteries, Fuel Cells, QDDSCs, Light Therapy, Drug Delivery Flexible Printed Electronics, Mechanical and Gas Sensing Applications, Thermoelectric Materials.
- Nanostructured Conducting Polymers and their Application in Sensors, efficient adsorbent, Catalysis, Drug Delivery and Supercapacitors.
- Nanocatalyts for Micro-Reaction Systems and High and Low Temperature Synthesis Applications (Pharmaceutical and Petrochemical).
- Electro-Optical Characterization of Carbon Nanostructures by Using Advanced Laser Photolysis Techniques.
- Inorganic Material/ Organic Polymer Nanocomposites and Their Application in Sensors, Catalysis, Photocatalysis, Drug Delivery, Super Adsorbents and Supercapacitors.
- Mesoporous Materials and their Application in Sensors, Efficient adsorbent, Catalysis, Drug Delivery and Supercapacitors.
- Nanostructured Coatings for Corrosion Protection and Thermal Management.
- 2D and 3D micro printed Organic and inorganic materials for electronic, energy, and biomedical applications.
- Self-sterilizing membrane for air and water treatment.

Biotechnology Program (Bio)

- Medical (Diagnostics and Therapeutics) / Pharmaceutical Biotechnology/medicinal chemistry.
- Industrial Biotechnology.
- Environmental Biotechnology: Bioremediation/ Pollutants, Ecosystems.
- Food and Agricultural Biotechnology.
- Bioinformatics: Analysis and Interpretation of Biological Data.

Applied and Computational Mathematics (ACM) Program

- Computational Methods for Ordinary , Fractional and Partial Differential Equations
- Fractional Calculus and Applications
- Dynamical Systems
- Stochastic Modelling
- Optimization
- Applications of Computational Mathematics to Science And Engineering

Energy Materials Program

- Physics of Solar Cells Devices
- Physics of Semiconductors for Energy Applications
- Quantum Structures for Optoelectronics
- Physics of Nanoelectronics and Spintronics Materials
- Solar Fuels: Conversion of Light Energy into Chemical Energy

- Nanocrystalline Thin Film Solar Cells
- Nanocrystalline Carbon Quantum Dots for Photoenergy and Medical Therapy
- Thin Film and Bulk Thermoelectric Materials
- Characterization of Novel Semiconductors Materials in Space Missions
- Impact of Radiation on Energy Materials in Space Environment

Space Environment Program

- Space Environment
- Space Weather
- Space Plasma
- Solar Physics
- Geomagnetism
- Global Navigation Satellite Systems
- Heliospheric Physics
- Ionospheric Physics
- Cosmic Rays
- Elementary Particles
- Earth's Atmosphere

Documents Required for Application

The following documents (SCANNED Copies) should be attached to the Online Application Form. Once the applicant passes the interview he/ she will be required to submit certified copies (certified by the Egyptian embassy) by May 31st, 2021:

Application Form	Attach a scanned copy of the signed application form. The applicant shall download the application, print, sign, scan and attach it.
Statement of Purpose	A statement of your reasons to join E-JUST
CV	
B.Sc. Certificate and B.Sc. Transcript	**The B.Sc. transcript must include the grading system (the scanned copy of the transcript must be both sides front and back)**
B.Sc. Graduation Project	The file shall include the whole project (not a summarized copy)
M.Sc. Certificate and M.Sc. Transcript	For PhD applicants
M.Sc. Summary	For PhD applicants only
M.Sc. Thesis	
Two academic recommendation letters	Attach two letters of recommendation from professors or ex-advisors in the applicant's affiliating university/academic institution
Research Proposal	The applicant must attach his/her research proposal to the application. The proposal shall be about the research area that he/she chose from the application form.
International TOEFL 79/Academic IELTS 6.5	**Applicants whose native language is English are not required to submit official evidence of English language proficiency**
Personal Data Passport Page	The page containing the applicant's name and date of birth (Valid for at least two year)
Personal Photograph (Formal Photo)	Attach one personal photograph (size 4×6 cm, upper half of body, full-faced, hatless) taken within the past 6 months.
Certificate of health (E-JUST designated form)	Click Here to Download the Form
Security Application (E-JUST designated form)	Click Here to Download the Form
Endorsement Letter (For Currently employed TAs/ Researchers...etc.)	Applicants who apply for TICAD7 scholarship and currently working as teaching or research assistants must submit an endorsement letter.

	The endorsement letter states that the applicants shall continue their jobs in their home universities or institutions after completion of their postgraduate programs at E-JUST. It must be an official statement signed and stamped by the affiliated institution
Handbook of the university / faculty / institute ….etc. of the certificate for Bachelor degree (and M.Sc. degree for PhD applicants)	It should stating clearly the conditions of registration, conditions of obtaining the certificate and the scientific content of the study curriculum The part that includes the required information only). It can be obtained from the university website.

Note[1]: All credentials submitted must be in English, or alternatively, an official translation must be attached to the documents originally not issued in English.

Note[2]: Original documents submitted shall NOT be returned under any circumstances

Note[3]: Any Costs incurred during the selection procedures including travel expenses, documents preparation (official papers, photos, visa application, etc.) and any other personal expenses will NOT be covered but should be paid by the applicant.

Scholarships Terms and Conditions

TICAD7 Scholarship

E-JUST offers "**E-JUST TICAD7 African Scholarship for STI**" to develop high quality human resources in the field of STI (Science, Technology and Innovation) toward future African STI network and beyond. These scholarships are provided under the cooperation of the Egyptian government and JICA (Japan International Cooperation Agency).

Eligibility Requirements:

- Applicants shall be researchers or instructors (or potentially expected to become those) who belong to universities or research institutions in Africa who needs to obtain M.Sc. degree in Engineering.
- Applicable programs: Please refer to page 5&6.
- Applicant must be a holder of nationality of a country in Africa except for Egypt.
- Must have home address and current address in African continents.
- Not serving in the military.
- Applicants should fulfil admission requirement and pass interview and oral examination.
- Applicants shall continue their jobs in their home universities or institutions after completion of their postgraduate programs at E-JUST. Endorsement of application forms by their home institutions is required in order to assure they would return to home institutions in future.

Scholarship Coverage:

The scholarship is a full scholarship covers:

- Tuition fees.
- Accommodation
- Monthly stipend
- Medical care
- Round Flight ticket

How to apply?

Please check the box "Apply for E-JUST TICAD7 African Scholarship for STI" when you apply online and upload Letter of endorsement by home institutions in addition to the required documents.

Scholarship Term:

- The scholarship's term is the period necessary to complete the degree requirements in E-JUST, which should be two years for the M.Sc. degree preceded by 6 months for preparatory courses (if necessary).
- The scholarship's support is dependent upon the student good standing with E-JUST graduate program in which he/she is registered. An evaluation progress report will be

sent semi-annually to the sponsor reporting about the student's study level, including the student's transcript, academic advisor report, and the updated student research situation.

- Scholarships are full-time scholarships; this means that E-JUST students are fully devoting to their study and research in E-JUST and are not allowed to work elsewhere during their scholarships' period.