14- Computer Engineering Department

Vision	To be the driving force for international computer engineering departments with distinguished members and graduate

Disciplines	1	Computer Architecture and Microprocessors
	2	Software Engineering and Computer Languages
	3	Computer Networks
	4	Artificial and Machine Intelligence and Robotics
	5	Computer Vision and Image Processing and Remote Sensing
	6	Computer Systems Security and Data Encryption
	7	Database Systems and Information Technology
	8	Modeling Simulation and Testing of Computer Systems
	9	Design Automation for Computer Systems and Circuits
	10	Parallel and Distributed Computational Systems
	11	Computer Graphics and Multimedia
	12	Embedded and Real Computer Systems
	13	Manufacturing and Processing of Computers
	14	Operating Systems and Algorithms
	15	Distributed and Mobile Computations over Networks
	16	Blockchain
	17	Data Science and Analytics

Research Areas for Each Discipline	1	**1- Computer Architecture and Microprocessors** - Computer Architecture - Memory and Cache Architectures - On-Chip Interconnections - Multi-core and Multithreading - Processor Micro-architectures

Research Areas for Each Discipline	2	**2- Software Engineering and Computer Languages** - Service oriented architecture SOA - Optimization, Reliability and Adaptation - Context-Aware Pervasive Computing - Agent-oriented Software Abstractions
	3	**3- Computer Networks** - Network Operations and Management - Network Architecture and Design - Network Flows and Security - Routing Algorithms - Network Standards and Protocols - Next Generation Internet - Network Simulation and Emulation
	4	**4- Artificial and Machine Intelligence and Robotics** - Machine Learning - Search Engines - Cognitive Robotics - Robotics & Automotive - Human-Computer Interaction - Video Mining - Computational Finance - Computer Vision - Computational Intelligence. - Self- Search techniques - Bayesian Networks - Natural Language Processing - Avitars - Reinforcement Learning - Deep Learning - Self-Driving Cars - Humanoid Robots - Wearable Robotics - Machine Translation - Speech Recognition and Understanding - Knowledge Acquisition - Agent Technology (Intelligent Agents) - Genetics-based machine learning - Neural Networks - Pattern Classification

Research Areas for Each Discipline	5	**5- Computer Vision and Image Processing and Remote Sensing** - Hyper-Spectral Image Applications - Image Reconstruction - Terrain and Crop Analysis from Remote Sensing - Computer Vision Applications (Industrial - Intelligent Visual Surveillance - …)
	6	**6- Computer Systems Security and Data Encryption** - Encryption - Network Security - Authentication Mechanisms - Enterprise data security - IP protection - Privacy protection - Electronic Payment Systems - Electronic Voting Systems - Hardware Security Units
	7	**7- Database Systems and Information Technology** - Distributed Databases - Database Security
	8	**8- Modeling Simulation and Testing of Computer Systems** - Modeling and Simulation of Multi-core Architectures - Modeling and Simulation of DSP Architectures
	9	**9- Design Automation for Computer Systems and Circuits** - Double Patterning for Photolithography. - EDA tools for Automatic Routing and Placement. - Design for Manufacturing and for Yield tools. - Formal Verification Tools - Hardware synthesis Tools from High-level Languages

Research Areas for Each Discipline	10	**10- Parallel and Distributed Computational Systems** - Parallel and Distributed Architectures - Parallel and Distributed Models - Interconnection Networks - Cluster and Grid Computing - High Performance Computing - Reconfigurable Computing - Wireless/Sensor Networks and Pervasive Computing - Cloud Computing
	11	**11- Computer Graphics and Multimedia** - Shape Simplification - 3D Models Segmentation - Object Reconstruction - Cloth and Texture Simulation
	12	**12- Embedded and Real Time Computer Systems** - Specification and Design - Hardware/Software Co-design - Static and Dynamic Timing Analysis - Modeling for Power, Performance and Reliability - Design Space Exploration - System on Chips - Validation, Verification and Debugging techniques
	13	**13- Manufacturing and Processing of Computers** - Multi-core Architectures and Supporting compilers and Operating Systems - Testing, Validation and Verification of Hardware Design
	14	**14-Operating Systems and Algorithms** - Multi-Core Operating Systems Kernels

Research Areas for Each Discipline	**14** - Distributed Storage Systems - Randomized Algorithms - Combinatorial Optimization and Approximation Algorithms - Testing and Verification of Algorithms
	15 **15- Distributed and Mobile Computations over Networks** - Wireless Networks and Protocols - Wireless Technology - Security, Trust and Privacy - Data Measurement and Analysis - Ad hoc Networks - Sensor Networks and Embedded Systems - Resource Management and Wireless QoS - Mobile Internet - Mobile Computing
	16 **16- Blockchain** - Blockchain and Machine Learning - Blockchain Scalability and Performance - Blockchain Challenges and Mitigation Techniques - Blockchain Adaptability for IoT - Blockchain Applications in Energy and Healthcare
	17 **17-Data Science and Analytics** - Data Science - Analysis of Social Media - Semantic Web - Web Science - Social Computing - Data Driven Medicine - Privacy Enhancing Technologies for Data Science