

Faculty for the Future - Examples of Typical Disciplines Awarded

Higher Level Discipline	Degree	Research Focus
Aerospace Engineering	PhD Aerospace Engineering	Reservoir modeling for gas hydrates and heavy oil deposits
Agriculture	Post-Doc Weed Ecology (Molecular biology and genetic engineering)	Genomics of Weedy Species
Aquatic Chemistry	PhD Water Science	Climate Change and Variability Impacts on Water Resources Management of the Zambezi River Basin
Architecture	PhD Environmental Design	Investigating the impact of Indoor Air Quality in elementary schools, because IAQ and ventilation in school buildings can affect the health of the students and their performance
Bioengineering	PhD Material Sciences	Bone Tissue Engineering and Regenerative Medicine
Bioengineering	PhD Physics	Freehand medical ultrasonic technology. Providing real-time 3-D object visualization on lower computational cost
Bioengineering	PhD Bioengineering	Reprogramming Adult Bone Marrow Stem Cells
Bioengineering	PhD Bioengineering	Pelvic Organ Prolapse and Urinary Incontinence
Bioengineering	PhD Biomedical Engineering	Investigating reversible conduction block induced by high frequency Alternating Current (AC) stimulation
Bioengineering	PhD Biomedical Engineering	Neural Signal Processing, Instrumentation, Clinical Neuroscience
Bioengineering	PhD Bioengineering	Investigation on Rules Governing Long-Term Learning in Complex Networks of Neurons
Bioengineering	PhD Ionospheric physics	Medical image processing
Bioengineering	PhD Computational Biology and Bioengineering	Investigation on the dynamic behavior of single crystal actuators
Bioengineering	PhD Biopolymer Networks	Design of novel efficient enzymes derived from phenylalanine dehydrogenase to obtain enantio-pure natural and non-natural amino acids
Bioinformatics	PhD Bioinformatics	Comparative Genomic Analysis of Kinetoplastid Protozoa
Biology	PhD Infectious diseases and Immunology	Role of Properdin in Infectious Diseases
Botany	PhD Molecular Systematics	Conservation Genetics and Molecular Systematics
Chemical Ecology	PhD Entomology	Alternative Strategies for Controlling Insect Pests
Chemical Engineering	PhD Engineering Science	Toxic Metalworking Fluid Wastewater
Chemical Engineering	PhD Chemical engineering	Confined dynamics of complex two-phase systems containing surfactants and/or viscoelastic fluids. Applications to Enhanced Oil Recovery (EOR)
Chemical Engineering	PhD Chemical Engineering	Ceramic dense nano-powders of thermoelectric oxides: synthesis, processing and their properties
Chemistry	PhD Chemistry	Drug Delivery Systems

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Chemistry	Post-Doc Inorganic Chemistry	Development of novel heavy-metal labels for structural elucidation of proteins by EM
Chemistry	Post-Doc Biomolecular simulations	Biomolecular Simulations
Chemistry	PhD Chemical Engineering	Carbon Nanotubes and Aluminum-Carbon Composites
Chemistry	Post-Doc Chemistry Science	Porous Metal-Organic Frameworks
Chemistry	PhD Petroleum Engineering	Fuel cell science - high temperature polymer electrolyte fuel cells using renewable bio-ethanol fuel
Chemistry	PhD Biomedical Engineering	Enzymatic resolution of chiral amines
Chemistry	Post-Doc Geophysics	Research on minimizing health-hazardous emissions - combustion of alternative fuels
Chemistry	PhD Chemistry	Organometallic Coordination Chemistry
Chemistry	PhD Biochemistry	Investigation on the Particle Replication in Non-wetting Templates method
Chemistry	PhD Petroleum Engineering	Biocrystallographic and kinetic studies of drug resistant mutants of HIV protease - relevant especially to HIV related cancers
Chemistry	PhD Offshore Engineering	Development of new DNA-based hybridization biosensors focused on the early detection of cancerous or inherited endemic diseases
Civil and Environmental Engineering	PhD Civil Engineering	Sustainability of Concrete
Civil and Environmental Engineering	Post-Doc Civil and Environmental Engineering	Water Resources Planning and Management
Civil and Environmental Engineering	MSc Urban Management	Ecological and sustainable regional planning
Civil and Environmental Engineering	Post-Doc Transport of particles and fibers in porous media	Sub-surface constructed wetland for removal of organic and heavy metal
Civil and Environmental Engineering	PhD Civil Engineering	Design of remedial systems for groundwater contamination
Civil and Environmental Engineering	PhD Biomedical Engineering	3D Ultrasound Imaging
Civil and Environmental Engineering	PhD Civil engineering	Displacement-Based Design of Structures
Civil and Environmental Engineering	PhD Environmental Engineering	Reuse of Greywater for Urban Agriculture
Civil and Environmental Engineering	PhD Pharmacology	Microwave in situ treatment of volatile organic pollutants in soil
Civil and Environmental Engineering	PhD Environmental Engineering	Groundwater Pollution Assessment for Environmental Management
Civil and Environmental Engineering	PhD Mechantronics	Investigation on water constraints in developing biomass as a source of renewable energy
Civil and Environmental Engineering	PhD in Water Resources Engineering	Catchment-level Environmental Changes Using Remotely Sensed Data

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Computer Engineering	PhD Electrical and Computer Engineering	Challenges for Transmission Control Protocol (TCP) in modern computer networks
Computer Engineering	PhD Geology and Paleontology	Interpretation of past environmental, ecological and climate changes by using stratigraphy and plant-fossil taphonomy of sedimentary basins
Computer Engineering	PhD Computing Science	Managing Conflict Among Non-Functional Requirements
Computer Engineering	PhD Optoelectronics	Non-linear filters for insertion of computational intelligence into application specific software and hardware devices
Earth and Atmospheric Sciences	PhD Earth and Atmospheric Sciences	Determining transient and long-term climate impacts of different deforestation pathways, the socio-economic & climate feedbacks, and policy implications
Ecology	PhD Ecology	Introduction of Invasive Alien Species
Ecology	Post-Doc Community Forests and Payment for Ecosystem services	Community Forests and Payment for Ecosystem Services
Electronics and Electrical Engineering	PhD Magnetic Resonance Imaging (MRI)	Development of antennas in magnetic resonance imaging
Electronics and Electrical Engineering	PhD Engineering and Public Policy	Optoelectronics-based solar applications and mobile telephone networks.
Electronics and Electrical Engineering	PhD Electrical Engineering	Wireless Telecommunication Networking [Federation of Ad Hoc Networks]
Electronics and Electrical Engineering	PhD Electronic and Computer Engineering	Development of a virtual instrumentation workbench for teaching
Electronics and Electrical Engineering	MSc Electrical Engineering	Development of Cognitive System Engineering Model
Electronics and Electrical Engineering	MSc Manufacturing Engineering and Management	Research on groundwater flow and petrophysical analysis by using back-propagation network
Electronics and Electrical Engineering	PhD Electrical and Electronics Engineering	Statistical Load Flow for Energy Distribution Systems
Electronics and Electrical Engineering	PhD Computational Condensed Matter Physics	Hyperfrequency signal generation by optical means and optoelectronic oscillators. Development of new architectures for the generation of microwave signals by optical means
Environment	PhD Environmental Science	Focus on clean water generation using novel carbon nanotube based nanocomposites, comprising of nanoparticles immobilized on multi-walled carbon nanotubes (MWNTs). Of particular interest is arsenic removal from water
Environmental Science	PhD Environmental Science	Reducing Viral and Bacterial Disease in Shrimp Farming
Environmental Science	PhD Chemistry	Modelling flooding in Niger Delta in particular due to compaction of oil and gas bearing formations depleted by extraction.
Environmental Science	PhD Environmental Science	Impact of Climate Change on Rural Populations
Environmental Science	PhD Environmental Science	Dynamics of Dissolved Organic Matter in Water

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Environmental Science	PhD Environmental Studies (Human Security and Environment Program)	Advanced Agricultural Technologies for Food Sufficiency, Food Security, Rural Development and Environmental Management
Environmental Science	PhD Environmental Science	Relationship between deep convection and gravity waves in the middle atmosphere and ionosphere
Geology	PhD Hydrology	Water Resources and Availability
Geology	PhD Ultrasonic imaging	Seismic investigation in the AfricaArray project
Geology	PhD Physics	Research on mining-induced seismicity
Geology	PhD Mechanical Engineering	Regional climate change using specific lake environments as indicators
Industrial Engineering	PhD Mechatronics	Using Failure Mode and Effects Analysis (FMEA) to investigate risks during new product introduction
Material Engineering	Post-Doc Metallurgical and Materials Engineering	Study of emissions generated during combustion and pyrolysis of solid residues which contain organic matter, mainly oil derivatives and biomass
Material Engineering	Post-Doc Photonics	Focus on photonic crystals device fabrication and their investigation through optical spectroscopy and microscopy for application in optical communication
Mathematics	Post-Doc in Mathematics	Algebraic Topology, Geometry and Combinatorics.
Mathematics	PhD Mathematics	Mathematical Theory of Random Dynamical Systems
Mechanical Engineering	PhD Mechatronics	Heat transfer and fluid flow in nanofluids
Mechanical Engineering	Post-Doc Petroleum Engineering	Development of microsensors and microactuators for closed loop diabetes treatment systems
Mechanical Engineering	PhD Mechanical Engineering	Using physical methods to study biological systems, including macromolecules, membranes, nerves and muscles etc.
Mechanical Engineering	PhD Mechanical Engineering	Fracture Mechanics. Stress analysis of cracks under mode II and mixed mode I-II loading conditions using the method of photoelasticity
Petroleum Engineering	PhD Space Physics (Helioseismology)	Water abatement in gas reservoirs
Petroleum Engineering	PhD Physics	Petroleum Engineering and software
Petroleum Engineering	Post-Doc Interdisciplinary Chemical Sciences	Condensate reservoir Studies
Petroleum Engineering	Post-Doc Civil and Environmental Engineering	Simulation of geological CO2 storage
Petroleum Engineering	PhD Mechanical Engineering	Strength and fatigue analysis of deep water offshore platforms especially Floating Production Storage and Off-Loading (FPSOs)
Physics	Post-Doc Physics	Optical manipulation and freezing of Aerosol Particles
Physics	PhD Physics of Polymers	Computer Models for High-Temperature Proton-Exchange Membrane Fuel Cells
Physics	Post-Doc Physics - Fluid dynamics	Mechanisms of Information Encoding in Oscillatory Sensory Cells
Physics	PhD Physics	Spin and Polarization Dynamics in Multiferroics and Frustrated Systems
Physics	PhD Physics	Mechanical Properties of cytoplasm of cells to understand cell division and cell motility

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Physics	PhD Bioengineering	Investigation of device and material parameters of thin film solar cells and photovoltaic modules
Physics	PhD Medical Physics	Radiotherapy and Treatment Planning Systems
Physics	PhD Physics	Mammography (radiation safety)
Physics	PhD Petroleum Engineering	3D numerical and experimental investigations of the pulsed discharge for ultra-fast plasma control
Physics	PhD Physics	Cost-Effective Renewable Energy Source for Fuel Cells
Physics	PhD Computational Condensed Matter Physics	Studying the optical properties of quantum dots using Density Functional theory(DFT). Development of energy density method plus studying a new method to estimate the growth of nanoclusters in experiment
Science Education	PhD Science Education	Science Assessment of Students' Learning