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COLLEGE OF ENGINEERING

Founded on June 13, 1910, the UP College of Engineering offers the most comprehensive engineering curricula in the Philippines. In keeping with the highest academic standards set by the University of the Philippines, six professional departments and two institutes offer undergraduate and graduate programs that are recognized by universities around the world.

The College's thrust towards research is emphasized in the number of research laboratories attached to each Institute or Department. Through works conducted by students and faculty members, the College has consistently published their work in reputable engineering and scientific journals as well as in conferences both national and international.

With a tradition of excellence in teaching and research, the College boasts of faculty members with advanced degrees. The College has the highest concentration of faculty members with Ph.D. in any Engineering school in the Philippines. Our faculty members have obtained their advanced degrees in well-known Universities in the United States, Japan, Europe, and Australia. The College actively pursues collaborative works with industries, government agencies, academes, and other units of UP. The College also provides extension services by its faculty members through its research and extension arm, the National Engineering Center and its affiliated research centers namely, Building Research Service, National Center for Transportation Studies, National Hydraulic Research Center, and Training Center for Applied Geodesy and Photogrammetry.

Vision

A global leader in engineering education, research, technology innovation and service.

Mission

Knowledge

To nurture honorable & excellent engineers and future leaders with global perspectives and aspirations for the nation.

Progress

To generate knowledge and produce innovations that address challenges in sustainability, safety and security, health and quality of life.

Service

To serve the evolving needs of society through proactive, interdisciplinary and multi-sectoral initiatives.

University of the Philippines Diliman

University of the Philippines Diliman

Institutes, Departments and Programs

Electrical and Electronics Engineering Institute
Institute of Civil Engineering
Department of Chemical Engineering
Department of Computer Science
Department of Geodetic Engineering
Department of Industrial Engineering
Department of Mechanical Engineering
Department of Mining, Metallurgical and Materials Engineering
Energy Engineering Program
Environmental Engineering Program

Undergraduate Degree Programs

- Bachelor of Science in Civil Engineering
- Bachelor of Science in Chemical Engineering
- Bachelor of Science in Computer Science
- Bachelor of Science in Computer Engineering
- Bachelor of Science in Electrical Engineering
- Bachelor of Science in Electronics and Communications Engineering
- Bachelor of Science in Geodetic Engineering
- Bachelor of Science in Industrial Engineering
- Bachelor of Science in Materials Engineering
- Bachelor of Science in Mechanical Engineering
- Bachelor of Science in Metallurgical Engineering
- Bachelor of Science in Mining Engineering

Graduate Degree Programs

- Master of Science in Chemical Engineering
- Master of Science in Civil Engineering
- Master of Science in Computer Science
- Master of Engineering in Electrical Engineering
- Master of Science in Electrical Engineering
- Master of Science in Energy Engineering
- Master of Science in Environmental Engineering
- Master of Science in Geomatics Engineering
- Master of Science in Industrial Engineering
- Master of Science in Materials Science
- Master of Science in Mechanical Engineering
- Master of Science in Metallurgical Engineering Master of Science in Remote Sensing
- Doctor of Engineering in Chemical Engineering
- Doctor of Engineering in Electrical Engineering
- Doctor of Philosophy in Chemical Engineering
- Doctor of Philosophy in Civil Engineering
- Doctor of Philosophy in Computer Science
- Doctor of Philosophy in Electrical Engineering
- Doctor of Philosophy in Energy Engineering
- Doctor of Philosophy in Environmental Engineering
- Doctor of Philosophy in Materials Science and Engineering

Highlight

The UP College of Engineering is declared a “Center of Excellence” by the National Research Council of the Philippines, with its highly funded research projects from the Philippine Department of Science and Technology through the Engineering Research and Development for Technology (ERDT) Program. With this Program, and in partnership with the Alumni and Industry, the College also offers competitive scholarships to Filipino engineers and fresh graduates with high potential. A newly built engineering complex is slowly rising at the sprawling side of the campus to house the different Departments and Institutes in their respective building and research laboratories, where quality and scholarly researches are expected to accelerate and foster innovation.

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Dean, College of Engineering
ERDT Program Leader

University of the Philippines Diliman

University of the Philippines Diliman

Electrical and Electronics Engineering Institute

The University of the Philippines-Electrical and Electronics Engineering Institute (UP-EEEI) is the premier institution for teaching and higher learning in the field of electrical and electronics engineering in the Philippines. Research and instruction in UP-EEEI are holistic--addressing the fundamental and complex technological elements across wide-ranging fields to the applications and interdisciplinary collaborative activities that lead to relevant, high impact innovation.

Graduate Degree Programs

Master of Science (MS) in Electrical Engineering
Master of Engineering (ME) in Electrical Engineering
Doctor of Philosophy (PhD) in Electrical Engineering

The graduate program is divided into the following fields:

Computers and Communications

Computer networks. Wireless communications. Radio propagation and antennas. RF/Microwave engineering. Computer architecture. Digital signal processing. Speech, image and video processing. Mobile, wearables and Internet of things (IoT)

Microelectronics

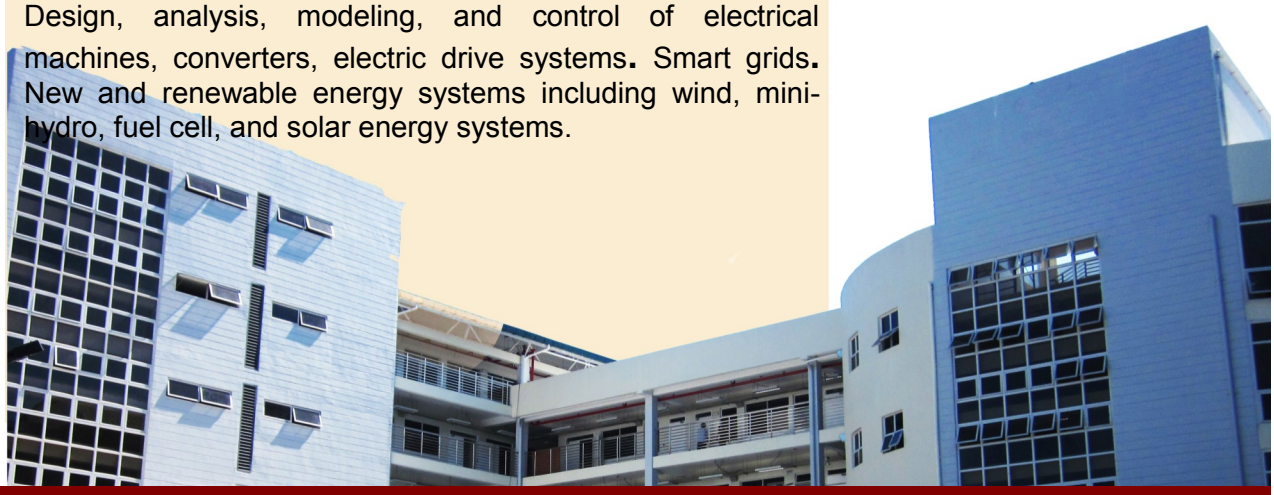
Radio frequency (RF) IC design. Microprocessor development and design. Low power electronics and semiconductor device research. Analog, digital and mixed signal electronics

Instrumentation and Control

Power electronics. Robotics and automation. Embedded systems applications in control, sensor design, and biomedical instrumentation

Power and Energy

Electric power system optimization. Economic operation, dynamics and control, protection and reliability evaluation. Electrical transients and power quality. Electricity markets. Design, analysis, modeling, and control of electrical machines, converters, electric drive systems. Smart grids. New and renewable energy systems including wind, mini-hydro, fuel cell, and solar energy systems.



Faculty Profile

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Wireless communications, DSP, Embedded systems

UP-EEEI has 12 research groups and laboratories catering to diverse interests and specializations of

Analog Devices Microelectronics Laboratory and the **Intel Microprocessors Laboratory**
Microelectronics and Microprocessors Laboratory, established in 1987, is tasked with developing the integrated circuit (IC) design capabilities of the Electrical and Electronics Engineering Institute of the University of the Philippines Diliman. The goal of the laboratory is to produce globally competitive engineers and technologies to further grow and develop the Philippine semiconductor and electronics industry.

Astec-Power Electronics Laboratory
The main objective of the laboratory is to expose students to the various fields of power electronics. PEL research areas include power supplies, electric vehicle charging, LED lighting, motor drives, power amplifiers and electromagnetic compatibility.

Computer Networks Laboratory
Research in CNL covers various rapidly-evolving aspects and applications of communication networks, including but not limited to mobile systems, social networks, application-layer overlays, novel link / routing / transport protocols, cooperative community networks, low-overhead computing and networking, smart grids and smart homes, sensor networks, the Internet of Things, and big data.

Digital Signal Processing Laboratory
Research in the DSP laboratory is geared towards DSP algorithm development and implementation. Areas of concentration include software and hardware embedded systems for real-time and non-real-time applications in audio, image, video and speech signal processing and digital communications. The DSP Lab is equipped with superior-quality multimedia computers, digital oscilloscopes and signal generators, DSP hardware development kits, digital audio tape recorders, Matlab® and specialized software.

Electric Power Research Laboratory
EPRL is dedicated to research and development in power system technology and economics related to the generation, transmission and distribution of electric energy and the operation of electricity markets. Research in the laboratory includes modelling and simulation of electricity markets and power system dynamics; security assessment and stability enhancement for power systems in the restructured environment; and power system planning and optimal operation that ensure supply security, market competitiveness, and environmental sustainability. EPRL maintains active linkages with the Philippine electric power industry and Wholesale Electricity Spot Market.

Instrumentation Research Center
IRC provides technology solutions in managing production resources, health care, and education, and is currently focused on biomedical devices, traffic monitoring, structural monitoring, and hardware interfaces for interactive learning. It is also the development arm of the DOST-UP Enterprise Center for Technopreneurship.

Mobile Robotics Laboratory
The laboratory's main concern is research on mobile robots and intelligent agents. The members of the laboratory involve themselves in various fields including almost every aspect of electrical engineering (power electronics, instrumentation & control, communications, embedded systems, artificial intelligence, operating systems) and a little of computer science, mechanics, biology and philosophy.

Power Systems Simulation Laboratory
PSSL conducts research on modelling, simulation, and optimization of electric power systems related to reliability, planning, protection, automation, control and power quality. It is equipped with power system simulation software and hardware simulators such as power system micro-models fitted with protective relays, RTUs, and SCADA.

Robotics and Automation Laboratory
RAL is a research laboratory working on robotic manipulators, bipeds and autonomous navigation. Current research topics are manipulator dynamics, motor drives, sensor development and autonomous vehicles.

Smart Grid Research Center
Research at SGRC include design and implementation of smart grid building blocks, control and communication solutions for smart grids, demand side management, integration of renewable energy resources and distributed energy resources (generation, storage, electric vehicles, and controllable loads) to electric power systems, microgrids, virtual power plants, smart buildings and smart homes, and regulatory aspects and market operations for smart grid.

Solar PV Laboratory
As one of the leading research institutions for renewable energy research in the country, the UPSL is continuously striving to develop, innovate, and promote novel energy technologies in order to uplift the quality of life for Filipino society and to safeguard the environment.

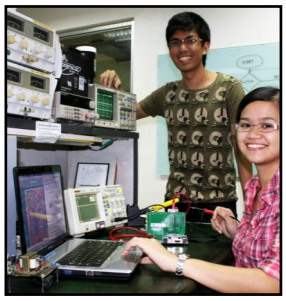
Ubiquitous Computing Laboratory
Ubiquitous Computing Lab (UCL) focuses on mobile, wearables and Internet of Things (IoT) research. UCL innovates on areas such as educational games, human-device interaction, virtual reality, animation, IoT protocols and smart apps. More info at ucl.ph.

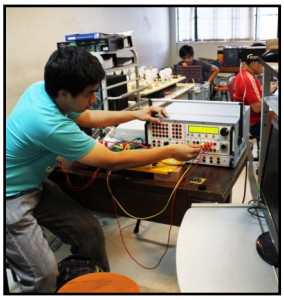
Wireless Communications Engineering Laboratory
The WCEL is a research and instructional facility engaged in the design, integration, analysis and testing of wireless communications devices, circuits and systems. The laboratory is equipped with state-of-the-art RF and microwave test equipment and simulation software. The laboratory has successfully built and tested digital microwave radios, antennas, RF amplifiers for use in various applications such as rural connectivity, emergency response and public safety.

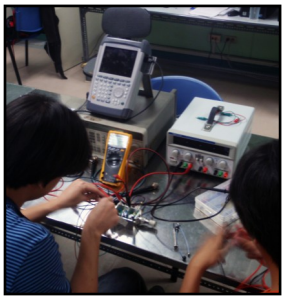
Electrical & Electronics Engineering

The EEE Institute also maintains the following facilities dedicated for instructional and training:

- Electronics Laboratory
- Advanced Electronics Laboratory
- Microelectronics Laboratory
- Communications Electronics and Embedded Systems Laboratory (CEESL)
- Electronics Prototyping
- Laboratory (EPL)
- Network Simulation and Training Laboratory (NSTL)
- Electrical Machines Laboratory (EML)
- Communications Systems Instructional Laboratory
- Electric Machines Laboratory
- Electricity Markets Instructional Laboratory
- Electric Power Instructional Laboratory







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Institute of Civil Engineering

University of the Philippines Diliman

An internationally recognized institution in instruction, research and extension service in civil engineering and specialized fields.

The curriculum offered when College of Engineering of the University of the Philippines opened its doors in 1910 was Civil Engineering. Originally, it prescribed a 4-year course leading to a degree of Bachelor of Science; the degree of Civil Engineer was conferred after an additional year of study. Revision of the curriculum to a 4-year course leading to a Bachelor of Science in Civil Engineering was immediately made. The 4-year curriculum with occasional changes in the required courses stayed on until 1953 when the 5-year curriculum in the various engineering disciplines was adopted.

Mission

Our mission is to nurture a culture of academic excellence, technological proficiency, and social relevance, and to synergize with interrelated institutions in the college, the university, the nation and the region.

The Institute of Civil Engineering has six (6) academic groups which handle teaching and research in the following disciplines:

- Construction Engineering and Management
- Environment and Energy Engineering
- Geotechnical Engineering
- Structural Engineering
- Transportation Engineering
- Water Resources Engineering

Graduate Degree Programs

MS and Ph.D. in Civil Engineering (in the following major fields)

- Geotechnical Engineering
- Structural Engineering
- Transportation Engineering
- Water Resources Engineering

Faculty Profile

There are 28 full-time graduate faculty members, composed of 7 professors, 10 associate professors and 11 assistant professors including 20 doctoral degree holders and 9 master's degree holders in the various fields of study in civil engineering.

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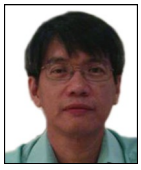

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Research Interests

Construction Engineering and Management Group (CEMG)

Sustainable Housing

- Eco-friendly (sustainable) Materials
- Sustainable Housing Systems
- Building Envelopes for Tropical Environment

Durable Infrastructure
- Safety and Reliability of Structures
- Effect of environment on structures
- Disaster Impact Reduction
- Management and Maintenance of Infrastructures
- Energy Efficiency in Civil Engineering Structures

Construction Productivity Improvement
- Development of IT-enabled Tools for Productivity Improvement (with CS/EEE)
- Development of Productivity Database for Construction (with IE)
- Harmonization of Construction Materials Standards with International Standards
- Development of Skills Evaluation Standards for Construction Workers (with TESDA)

Geotechnical Engineering Group (GEG)

Characterization of Indigenous Geomaterials
Construction in Problematic Geotechnical Conditions
Assessment and Mitigation of Risk Related to Geotechnical and Geoenvironmental Hazards

Structural Engineering Group (SEG)

Risk Management and Disaster Mitigation Program: Multi-Hazard Approach (Earthquake, Severe Wind, Fire)
Monitoring, Evaluation, Rehabilitation and Retrofit of Existing Structures
Design, Development and Testing of Alternative Infrastructure Systems
Design and Development of Structural Analysis Software for Research and Instruction

Water Resources and Engineering Group (WREG)

Water Supply and Sanitation
Water Related Disasters
Climate Change
Coastal Engineering

Environmental and Energy Engineering Group (EEEG)

Monitoring and Remediation of Contaminated Groundwater
- Saltwater intrusion
- Contamination from dumpsites
- Remediation technologies

Water Quality Management
- Water quality mapping
- Desalination for potable water supply

Sanitation and Wastewater treatment technologies
- Indigenous materials as filter media
- On-site and small wastewater treatment technologies

Environmental impacts on structures
- Corrosion of rebars due to saltwater
- Effect of acid rain on structures

Characterization of Philippine soils for Landfill Liners and Covers

Transportation Engineering Group (TEG)

Environmentally Sustainable Transport
- Road Safety and Maintenance
- Transport, traffic and environment modeling and simulation
- Re-engineering the jeepney

Facilities

The building infrastructures and laboratory facilities of the Institute recently received a major upgrade. From its present location at the College of Engineering building along Osmena Avenue in the Academic Oval, the Institute will soon transfer to its new site in the Engineering Complex II site along C.P. Garcia Avenue. Recently completed are the Office and Classroom Wing (OCW) building, laboratory buildings L1, L2, L3, L5, and a Utility building. OCW is the main building for classes, faculty offices, computational laboratories, and graduate students' workstations. A 300-capacity acoustic-treated theater is also available with breakout rooms for workshops and conferences. The Utility building contains the control system for power supply and stand-by electric generating set. L1 houses the laboratory facilities of the Structural Engineering Group including a 3mx3m bi-directional shaking table and a 7m-tall reaction wall. L2, which is contiguous with L1, houses the laboratory facilities of the Construction Engineering and Management Group. L3 houses the lab facilities of the Geotechnical Engineering Group. L5 is a stand-alone lab building for fire-related research. The next phase of construction will see the rise of lab building L4 of Water Resources Engineering Group and the contiguous building L6/L7/L8 housing the laboratories of the Transportation Engineering Group (L6), the Environmental and Energy Engineering Group (L7) and the laboratory administrative office (L8) of the Institute. The ICE Building is designed to utilize gray water from rains, with 2 of the 3 cistern compartments already built, and will have a Materials Recovery Facility in the next phase to properly treat its solid wastes according to environmental standards. Proposals are underway to build a wind tunnel facility adjacent to the L1/L2 building and a coastal engineering laboratory next to the L4 building, equipped with a 30m-long wave flume and a multi-directional wave generator on a 12mx20m wave basin .

Office and Classroom Wing (OCW) Building

L1/L2 Laboratory Building (Structural Engineering and Construction Engineering Laboratories)

L3 Laboratory Building (Geotechnical Engineering Laboratory)

Civil Engineering

L5 Laboratory Building (Fire Laboratory)

L4 Laboratory Building (Water Resources Engineering Laboratory, to rise)

L6/L7/L8 Laboratory Building (Environment and Energy Engineering and Transportation Engineering Laboratories, to rise)

ICE Faculty

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Department of Chemical Engineering

Leader in Chemical Engineering education with research collaborations with various universities in Japan, Australia, USA, Europe and the ASEAN region and has well-established linkages with Philippine Chemical Industries

Since its establishment in 1953, the UP Department of Chemical Engineering (DChE) has been a leader in chemical engineering education and research in the Philippines. Over the years, the Department has produced prime movers who have helped local chemical process industries (e.g., petrochemical, food, pharmaceutical, and energy and environmental technology services) become more competitive in the Southeast Asian Region.

Mission

We are an institution committed to:

- Produce world-class chemical engineering graduates
- Provide innovative and sustainable solutions to the technological challenges in the society, government and industry through research;
- Spearhead the development of technology with social and environmental responsibility in the interest of national progress

Vision

The Department of Chemical Engineering envisions itself to provide world-class engineering education that nurtures honorable, excellent and nationalistic leaders; generate knowledge and innovations that address challenges in sustainability, safety and security, health and quality of life; serve the evolving needs and requirements of society through proactive, interdisciplinary and multi-sectoral initiatives.

Graduate Degree Programs

MS in Chemical Engineering
Ph.D. in Chemical Engineering
D.Eng. In Chemical Engineering

The Department has seven research tracks; namely,

- Biochemical Engineering
- Electrochemical Engineering
- Environmental Engineering
- Fuels, Energy, and Thermal Systems Engineering
- Polymers and Catalysis
- Process Systems Engineering
- Separations Engineering

Each of these tracks has its own laboratory with state-of-the art equipment and instruments that cater to the research needs of faculty and students alike. The Department also offers an array of extension and testing services through the Chemical Engineering Analytical Laboratory.

Laboratories

Biomedical and Separations Laboratory
Application of chemical engineering principles to the design of biomedical devices. Studies on phase separations.

Bioprocess Engineering Laboratory
Research on biological processes in environmental and energy applications. Microbial and enzymatic processes for production of chemicals and materials. Bioseparations.

University of the Philippines Diliman

Environmental Engineering Laboratory
DChE has been involved in research works on processes and systems that address air, water and soil pollutants since the early 1990's. Research works on environmental process Engineering deal with sources, transport, transformation, fate and impact of contaminants in environment and development of upstream and end-of-pipe technologies that minimize pollution.

Electrochemical Engineering Laboratory

Polymers and Catalysis Laboratory
The Polymers and Catalysis Laboratory (POLYCAT) focuses on synthesis, characterization, and application of polymers and catalysts. POLYCAT is the youngest among the research laboratories at the Department of Chemical Engineering (DChE). The laboratory is divided into four research groups:

The Green Materials group, headed by Dr. Terence P. Tumolva,
The Industrial Materials group, supervised by Dr. Bryan B. Pajarito,
The Environmental group, guided by Dr. Maria Lourdes P. Dalida,
The Energy group, headed by Dr. Rizalinda L. de Leon

Fuel, Energy and Thermal Systems Laboratory
The Fuels, Energy and Thermal Systems (FETS) Research Laboratory seeks to develop sustainable processes for the production of alternative fuels along with high-value products; production of alternative working fluids and materials for cooling/heat transfer and energy storage; and performance and transport analysis of thermal systems.

Process Systems Engineering Laboratory
Process Systems Engineering laboratory deals with the design, fabrication, and implementation of controls to complex chemical and biological processes. Recently, the department has been working on sensors and automated data transfer designs in the field of H2S sensing and mining pollutants. The department is also investigating process designs for environmental and energy systems such as desalination and dye sensitized solar cells.

Faculty Profile

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Facilities

Fourier Transform Infrared Spectrometer
Differential Scanning Calorimeter
UV-VIS Light Spectrometer
Atomic Absorption Spectrometer
Scanning Electron Microscope
Real Time Polymerase Chain Reaction
Denaturing Gradient Gel Electrophoresis
Gel Documentation System
Universal Testing Machine
Bomb Calorimeter
Gas Chromatophy Mass Spectrometer
Gas Chromatophy Flame Ionization Detector
Gas Chromatophy Thermal Conductivity Detector
High Performance Liquid Chromatograph
Ion Chromatograph
Refrigerated Incubator
Karl Fischer Titrator
Kjeldahl Nitogen Analyzer

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Chemical Engineering

Chemical Engineering

Department of Computer Science

University of the Philippines Diliman

UPDCS aims to produce socially-responsible graduates equipped with knowledge and skills required for professional careers and advanced studies in computer science.

The Department of Computer Science of the University of the Philippines Diliman combines theoretical Computer Science with software engineering, computer systems, and scientific computing. The undergraduate program is designed to provide a solid foundation in computing, with courses supported by both a junior summer internship and a final year capstone research project that is linked with at least one of the seven research laboratories: Algorithms and Complexity, Computer Security, Computer Vision and Machine Intelligence, Networked and Distributed Systems, Scientific Computing, Service Science and Software Engineering Laboratory, and Web Science. The graduate program, with the MS and PhD in Computer Science degrees, reinforces this foundation with specialization in these research areas.

To add substance to the teaching, most members of the Department are engaged in active research and development. Various projects tackle problems such as monitoring and management (e.g., disaster, traffic), e-learning, health informatics, bioinformatics, security, and communications. Some of the these projects are funded by the Department of Science and Technology (DOST), the University of the Philippines, and other funding agencies. We encourage dissemination of knowledge via the conventional scientific and technical publications and conferences, as well as in engagement in community-based training and project deployments.

Graduate Degree Programs

MS in Computer Science
Ph.D. in Computer Science

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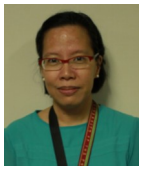

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Research Laboratories

Algorithms and Complexity Laboratory

The Algorithms and Complexity Laboratory (ACL) ventures into the following research fields that include Models of Computation and Complexity (automata and formal language theory and applications), Natural Computing, Bioinformatics, RiceInformatics, Algorithms, Design and Implementations, Algorithms for hard problems, Algorithmic Game Theory, Scheduling problem, Combinatorial Networks, Information Technology in Education.

Computer Security Group

The Computer Security Group (CSG) focus on the enhancement of the security of enterprise and mobile applications. Research goes into cryptographic algorithms, message protocols and the latest developments in cryptographic attacks.

Computer Vision and Machine Intelligence Group

The Computer Vision and Machine Intelligence Group (CVMIG) laboratory ventures into the following fields that include computation intelligence principles in biological, physical, and social systems Projects include machines that understand the deaf, programs that assist medical doctors in diagnosing poison and infections and robots playing football.

Networks and Distributed Systems Group

The Networks and Distributed Systems Group (NDSG) is closely affiliated with the Computer Networks Laboratory of the Electrical and Electronics Engineering Institute (EEEI). Research fields include fixed and mobile network protocols for more efficient and effective message exchanges.

Scientific Computing Laboratory

The Scientific Computing Laboratory (SCL) is interested in finding numerical solutions to problems arising from the physical, health, life, economic and social sciences and engineering modeled by differential equations. Research fields include Computational Science, which involves construction of mathematical models and numerical solution techniques and the use of computers to analyze and solve scientific, social scientific and engineering problems.

Service Science and Software Engineering Laboratory

The Service Science and Software Engineering Laboratory (S3) is a research lab where the designs and implementations of service systems are studied, and ensures the creation of software that provide values to others. Research is not limited to just building the software but may also include studies relating to artificial intelligence, networks, etc., as long as products made are essential to people. Research fields include database and software management systems and frameworks.

Web Science Group

The Web Science Group (WSG) attempts to understand what the Web is, engineer its future, and ensure its social benefits. Web Science Group is a young laboratory in the UP Department of Computer Science with researchers engaged in studying Linked Data, Mobile Web, and applications of the Web. Research fields include linked data, mobile web, web science and the applications of web technologies in different domains.

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Computer Science

University of the Philippines Diliman

Department of Geodetic Engineering

Leading Geomatics education, research, and extension through world-class curricula, University-Government-Industry Collaboration, and enhanced student learning.

The University of the Philippines Department of Geodetic Engineering (UPDGE) is the leading Geomatics education and research institution in the Philippines. Students' learning experience is further enhanced through the Geomatics Student Project Colloquium (GSPC) held every semester, the monthly DGE Department Seminar, and summer internships. UPDGE annually organizes the Philippine Geomatics Symposium (PhilGEOS), bringing together experts, decision makers, and students to present and discuss how Geomatics can help address pressing issues and problems.

With its UP Training Center for Applied Geodesy and Photogrammetry (UPTCAGP), UPDGE provides various training courses and professional services to government agencies, private companies, and individuals. UPDGE-TCAGP undertakes research and development projects funded by the Department of Science and Technology (DOST), Climate Change Commission (CCC), Commission on Higher Education (CHED), Japan International Cooperation Agencies (JICA) and other institutions. Through UP-DOST's Disaster Risk Exposure Assessment and Mitigation (DREAM) Program, UPDGE-TCAGP is mapping the major river basins, and soon the rest of the country, through a combination of LiDAR, Radar and Hyperspectral remote sensing systems. That's UP Department of Geodetic Engineering…*Charting the Future!*

Our department contains research laboratories as follows:

Applied Geodesy and Space Technology (AGST)- The Research Laboratory for Applied Geodesy and Space Technology (AGST Lab) is the pioneering research laboratory of the UP DGE & TCAGP, established in 2005 through a financial grant from the Philippine Council for Advance Science and Technology Research and Development (PCASTRD, now PCIEERD) of the Department of Science and Technology (DOST). This laboratory conducts research in applied geodesy and space technology applications such as geoid modeling, remote sensing observations, processing and analysis, geographic information systems (GIS)-assisted environmental monitoring and modelling, among others.

Environmental Systems Applications of Geomatics Engineering (EnviSAGE)- EnviSAGE is the research laboratory of the UP DGE & TCAGP which focuses on the use of Geomatics and geospatial technologies in addressing environmental issues. Conserving the environment requires knowledge of environmental processes. These processes create spatial patterns in environmental variables that can be examined to know more about what have occurred. While building on the past spatial patterns, conserving the environment also require a forward looking approach. Simulations and scenario analysis are prime tools to explore what can happen in the future, considering physical, natural, and socio-economic processes.

GeoSimulation (GeoSim) was established in the UP DGE & TCAGP to foster research and development of tools to simulate complex geographic phenomena and associated human spatial behaviors in order to advance our understanding of spatial processes, how systems work dynamically and interactively in the spatial environment, thereby generate new perspectives and

innovate towards a sustainable future. GeoSIM is not only concerned about properly mapping the distribution and status of natural resources in our environment, but also about finding out the reasons why such phenomena are happening around us in order that management policies and actions can be designed towards a more sustainable path. This requires new tools to model and simulate natural processes including human spatial behavior since much of environmental phenomena are induced or accelerated by anthropogenic processes. GeoSimulation provides a dynamic representation of spatial processes including human behavior; this opportunity will be harnessed to gain more understanding of complex spatial phenomena and to develop new theories and tools to further a sustainable future.

4. SurvLAV, which rhymes with "serve love", stands for **Surveying, Land Administration and Valuation**, is UP DGE & TCAGP research laboratory that focuses on surveying – the core of geodetic engineering, land administration and land valuation. Surveying is the science and art of obtaining spatial information, and extracting relevant information for a certain purposes. Land Administration is the proper management of land through the different processes involved in the determination of land ownership, land use and land valuation. Although land valuation is part of land administration, it is in itself a discipline that needs further studies in the Philippines. Land Valuation deals with the different techniques used to obtain the proper and correct value of land. SURVLAV will focus on providing new knowledge and innovation in the Geodetic Engineering profession through experimentation and researches on different surveying technologies and techniques; apply these techniques in consonance with other fields so as to provide a means of improving land administration in the country; and re-engineer land valuation.

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Department of Industrial Engineering and Operations Research

National leadership in Industrial Engineering education achieved by harnessing the synergy from academe, government, industry and alumni linkages.

Industrial Engineering is the application of engineering methods and principles of scientific management to industrial systems which include production and service systems. It is concerned with the design, improvement and installation of integrated systems of people, materials, information, equipment and energy. It draws upon specialized knowledge and skills in the mathematical, physical and social sciences together with the principles and methods of engineering analysis and design to specify, predict and evaluate the results to be obtained from such systems.

The Department of Industrial Engineering and Operations Research offers three degrees namely: Bachelor of Science, Master of Engineering and Master of Science in Industrial Engineering.

Creed

Consistent Academic Excellence and Leadership
Continuous and Progressive Research and Development
Productive Institutional Linkages and Partnership

Mission

Regional and national leadership in providing world-class industrial engineering education, research and development toward continuous improvement in productivity, quality and robustness in manufacturing and services.

Graduate Degree Programs

MS in Industrial Engineering
ME in Industrial Engineering

The Department of Industrial Engineering specializes in the following fields:

- Production Systems
- Operations Research
- Information Systems
- Human Factors and Ergonomics.

The department hosts the following research laboratories:

1. IE/OR Computing Laboratory
2. Human Factors and Ergonomics Laboratory
3. Information Systems Design, Education and Analytics (IDEA) Laboratory

Three additional laboratories are currently under construction and these are:

1. Integrated Product Design and Development Laboratory
2. Facilities Planning Laboratory
3. Engineering Quality Systems Laboratory

University of the Philippines Diliman

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Facilities

IE/OR Computing Laboratory and Information Systems Design, Education and Analytics Laboratory (IDEA)

The IE/OR Computing Laboratory and the Information Systems Design, Education and Analytics (IDEA) Laboratory are equipped with desktop computers, multi-media equipment and selected statistical, modelling, optimization, simulation and Enterprise Resource Planning (ERP) software packages.

Human Factors and Ergonomics Laboratory

The Human Factors and Ergonomics Laboratory is equipped with audio-visual equipment and

ergonomic assessment instruments such as manual dexterity tests, strength evaluation systems, Vernier data logger systems to measure sound, temperature, motion, EMG, and respiration, body analyser, Biometric System that include an electronic goniometer, and usability testing hardware and software.

Integrated Product Design and Development Laboratory
This laboratory facility will provide an action oriented setting for the creation and transformation of product concepts into tangible products or prototypes that could be tested and refined. This laboratory will be equipped with multi-media equipment, computer hardware and specialized measuring equipment. It will also be equipped with design and analysis software such as Auto CAD, Design for Manufacture and Assembly (DFMA) software, SIMAPRO Life Cycle Assessment (LCA) software, Packaging Optimization software. New instruments will be added such as equipment for fabrication, rapid prototyping, machining, assembly, finishing and testing of products or prototypes.

Facilities Planning Laboratory
The Facilities Planning Laboratory will be a new research laboratory to house research and development on the synergy of Facilities Design and Culture of Manufacturing. This is intended to promote the design and development of facilities, i.e., location, layout and related machine tools and equipment for manufacturing and service in consideration of the thought processes of the workers. This laboratory will be equipped with the eye tracking system and computers that will have design software such as CAD and those for layout revision simulation.

Engineering Quality Systems Laboratory
The Engineering Quality Systems Laboratory (EQSL) has three major missions:
Advancement of statistical knowledge for industrial applications
Technology development and knowledge dissemination
Education and training

The main research fields covered by the laboratory include engineering experimental design, response surface optimization, statistical process control, reliability engineering, and Six Sigma excellence.

Our research is driven by real-world cases from the manufacturing and service industries, where cost competence, customer-centric design of products and processes, and built-in quality have become standard scorecards for competitiveness.

The EQSL will be equipped with the latest versions of industrial software for each of our research areas, such as Design Expert 8 for experimental design and Minitab 16 for general-purpose engineering statistical computations. To support our mission of developing technology for industrial use, we plan to upgrade our capability to include software that boast of scripting and macro languages, such as Matlab, JMP, and SAS.

EQSL will also house a multimedia system for training and education, 30 workstations for simulation and computing, and a very attractive research team.

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Department of Mechanical Engineering

To be a world-class institution of Mechanical Engineering serving foremost the needs of the Philippines and its region.

The Department of Mechanical Engineering provides well-rounded and globally competitive basic and advanced education, research and innovation in the fields of thermal engineering, conventional and renewable energy, power generation, refrigeration, air conditioning, ventilation, machine design, control systems and automation, manufacturing, vehicle engineering and related multidisciplinary fields.

The department has several instructional, research and development laboratories, shops and fabrication facility that provide its students computational capability, hands-on training and exercises in using machine tools and equipment in mechanical engineering systems. These facilities enable students to do computational validation of designs, fabrication and building of components and systems, and research and development activities. The laboratory competencies that students learn are indispensable to their future in industry, academic and research institutions, and the government.

The following are the facilities of the Mechanical Engineering Department:

- Power Laboratory
- Computational Mechanics Laboratory
- EMERSON Heating, Ventilation, Air Conditioning and Refrigeration Laboratory
- Computer Integrated Manufacturing Laboratory
- Manufacturing and Design Center
- Instrumentation Laboratory
- Vehicle Research and Testing Laboratory
- M.E. Shop and Fabrication Facility.
- Biomechanics Laboratory, Machine Design Laboratory

Mission

Consistently produce top quality Mechanical Engineering graduates.
Continually develop new knowledge and undertake progressive research and development that will contribute to the industrial development of the nation.
Provide technical expertise to industry and strengthen linkages and partnerships with other institutions.

Faculty Profile

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Facilities

Power Laboratory

This laboratory houses several devices and systems involved in the generation, transmission and utilization of heat and mechanical power for purposes of instruction, research and for services such as engine testing of automotive fuels and testing of pipes and fittings.

Computational Mechanics Laboratory

This laboratory is equipped with computer units and processors and a number of software, most of which are sponsored by the developers.

EMERSON Heating, Ventilation, Air Conditioning and Refrigeration Laboratory

Donated by the Emerson Climate Technologies Inc. this laboratory contains HVAC and Refrigeration trainers and models of the systems components and a number of hardware and software required for a more precise design and evaluation of HVACR units.

Computer Integrated Manufacturing Laboratory (CIM Lab)

Houses a 4-station CIM Cell set-up used to simulate production and manufacturing systems. It serves as an educational laboratory for students to understand different aspects of manufacturing such as quality control, optimization and automation. It is also functioning as research/design laboratory in flexible manufacturing system (FMS) with the use of two small scale CNC machines and different robotics arms.

Biomechanics Laboratory
The laboratory is involved in the research and development of computational tools for analysing changes in forms and for studying human motion. It is equipped with a motion capture system and x-ray film scanner. Current research includes kinetics and statistical studies of human spinal configuration, biomorphometrics and gait analysis.

Machine Design Laboratory
A laboratory dedicated to machine design. The facility houses both hardware and software tools to complete the entire process of machine design, beginning form design concept, to Computer aided design, to analysis, rapid prototyping and testing. This research laboratory houses unique equipment that allows for reverse engineering, design modifications and improvement, strength and dynamic analysis, design verification and design for manufacture.

Manufacturing and Design Center
Housed in the German Yia II Hall (IE/ME Building), the UPME Manufacturing and Design Center came into being to serve the following needs:
- instruction of students and trainees in the use of computer-controlled and manually-controlled machine tools and other equipment dedicated to metals and materials processing and handling
- provide fabrication services for clients of the department, college and university
- a research center for product design and prototyping

The center is home to industrial-grade state-of-the-art machinery such as numerically-controlled machine tools as well as conventional machine tools, modern metal cutting and welding equipment, rapid-prototyping machines, and a computer center, among others.

Instrumentation Laboratory
This laboratory enables students to use advance instrumentation and control techniques required for precise data acquisition, system diagnostics, simulation, design, and failure analysis and prediction. This laboratory also conducts testing and calibration of devices and materials for the industry.

Vehicle Research and Testing Laboratory
Funded by the Department of Science and Technology (DOST) and the Department of Energy (DOE), this laboratory is an instrument with which the department is envisioned to become the national center for vehicle testing. This will be provided with a chassis dynamometer and emissions analyzers among others.

M.E. Shop and Fabrication Facility
This facility familiarizes the students to both conventional and modern manufacturing and machining processes, which will be useful in formulating engineering solutions to industry operations. This is also a venue for both students and researchers to build prototypes and test, evaluate and implement theoretical ideas and system designs.

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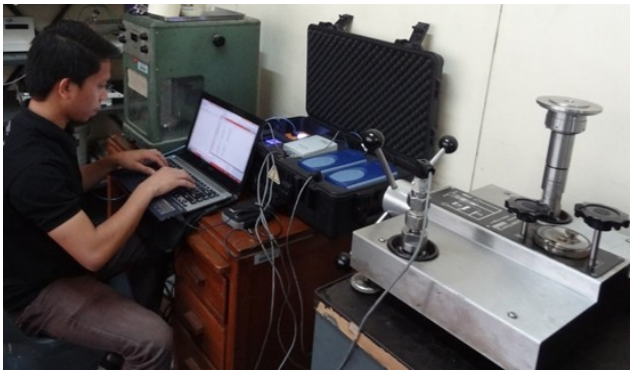

Design and Experimental Analysis of Heat-Driven Ejector Refrigeration System

Engr. Mark Anthony B. Redo, MSME, April 2014



Performance of Different Vegetable Oil - Diesel Blends Used in a Single Cylinder Diesel Engine

Engr. Amarlo A. Banania, MSME, October 2013

Mechanical Engineering

Faculty and Scholars Research Dissemination

Vehicle Research and Testing Laboratory (VRTL)

Computer Integrated Manufacturing (CIM) Laboratory

Design and Manufacturing Center

Graduate Faculty

Department of Mining, Metallurgical and Materials Engineering

University of the Philippines Diliman

A leading academic and research institution on mining, metallurgical and materials engineering that employs a multidisciplinary holistic approach for national and global progress.

The Department has three Research Thrusts, and each of these has a Research Group dedicated to achieving the goals of the thrust:

- Clean and Sustainable Extraction Technologies
- Smart and Functional Materials
- Materials for Energy

These thrusts are brought into fruition through the help of our research laboratories, which include:

- Pilot Plant
- Joeres Laboratory
- Shono Semiconductor Laboratory
- Electron Microscopy Laboratory
- Composite Materials Laboratory
- Smart and Fuctional Materials Laboratory
- Surface Science Laboratory
- Advanced Ceramics Laboratory

Graduate Degree Programs

- **MS in Metallurgical Engineering (MS MetE)**
- **MS in Materials Science and Engineering (MS MSE)**
- **Ph.D. in Materials Science and Engineering (Ph.D. MSE)**

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Facilities

Joeres Thermal Analysis Laboratory

The Joeres Laboratory houses the DMMME's materials characterization instruments such as Hardness Testers (Rockwell, Brinell, Micro-Vickers), Optical Microscopes, and Thermal Analyzers, as well as sample preparation tools such as Analytical Balances and Diamond Cutter.

Shono Semiconductor Device Fabrication Laboratory

This laboratory houses several equipment for thin films deposition and surface modification donated mostly by Dr. Katsufusa Shono from Sophia University in Japan and DOST. Some of its basic capabilities include film and substrate etching, controlled oxidation of substrates, etc. used mostly for fabrication of semiconductor devices. Aside from being an instructional laboratory, research groups also work and continue to upgrade existing equipment such as the Ion Shower Facility and Reactive Ion Etching Facility.

Electron Microscopy Laboratory

The DMMME's Electron Microscopy laboratory houses a Scanning Electron Microscope (SEM) with an Ion Sputter Coater for the sample preparation of non-conductive samples and a Transmission Electron Microscope (TEM) with a sample preparation set-up for the corresponding specimen-thickness requirement of the equipment. High magnification capabilities of these microscopes allow for study up to the nanometer level of both biological and material samples --- from metals to polymers, ceramics to composites. Interaction of

electrons with the atoms of the sample will give information such as surface topography, composition, crystal orientation and other properties of interest. The EML offers the following services: sample preparation, equipment operation and image acquisition, data analysis, and training.

Metallography Laboratory

The DMMME's Metallography laboratory consists of a Surface Morphology Apparatus and a polishing table where different grades of Silicon Carbide paper and polishing cloths can be interchangeably attached for sample preparation. Chemicals for the preparation of etching agents (etchants) are also available.

The microscope with an SLR camera attachment has magnification capabilities up to 2000X which is used primarily for microstructural analysis. A micrometer eyepiece attachment (with a micrometer slide for calibration) is also available for quick measurements of grains. As such, particle size analysis can also be done using the said equipment.

Composite Materials Laboratory

The composite materials laboratory of the Department was established to develop products that utilizes locally available raw materials such as abaca fibers and nanoclay which are indigenous and abundant in our country. At present, facilities of this laboratory include different types of ultrasonicators, high shear mixers, vacuum bagging assembly, electrospinning set-up, universal testing machine, thermal conductivity meter, viscometer, and modeling software which are vital for the execution of activities for the different R&D projects being pursued in this laboratory. Researches being done in the laboratory at present include value-adding local resources, engineering green materials and nanofiber membranes for wastewater treatment.

Smart Materials and Functional Laboratory

The DMMME's Smart Materials and Functional Laboratory (SmartLab) provides research and analytical services to undergraduate and graduate students, researchers, faculty, and staff of the university as well as researchers from other academic institutions. The laboratory houses several equipment: an Electro-Analyzer (Eberbach E1000) used in the determination of lead, nickel, copper, zinc, antimony, cadmium and other metals by the electro-deposition process, a table top (Metrohm-Autolab B.V. PGSTAT128N) as well as a portable hand-held (Unisan Instruments PG580) Potentiostat/Galvanostat used for various electrochemical applications such as corrosion measurements to the characterization of energy storage devices, a digital microscope for contact angle measurement, laboratory tube furnaces (Carbolite), several hot plates with magnetic stirrer, a compact research centrifuge (SpectrafugeTM 6C) , an analytical balance (Shimadzu AUX320), an ultrasonic cleaner, and a laboratory water bath (Memmert WNB7).

Current research studies under its wing involve the following: (1) Synthesis of Metal Nanowires and their Application in Transparent Conducting Electrode, (2) Formation of Oxide Thin Films for Catalysis and Photocatalysis, (3) Electrochemical Study of the Formation of Metal Nanoparticles, (4) Electrodeposition and Electroless Deposition of Metals and, (5) Development of Smart Alloys by Plating.

Surface Science Laboratory

The Surface Science Laboratory is equipped with a flotation apparatus that separates the valuable mineral from the waste by altering the surface properties of the mineral. Other equipment such as analytical balances, an air compressor and dissolved air flotation are also available.

Advance Ceramics Laboratory
The Advanced Ceramics Laboratory is a research laboratory on advanced ceramics processing and its characterization. The key research areas are advanced ceramic materials and devices for energy storage and conversion applications. The laboratory at present is equipped with sintering furnaces, oven, heating mantles, hotplates, ultrasonicator, fume hood, Ar-filled glove box, planetary ball mill, and other basic synthetic equipment and apparatus.

Extractive Metallurgy Laboratory
The Extractive Metallurgy Laboratory provides equipment necessary for studying the three main branches of metal extraction: pyrometallurgy, hydrometallurgy, and electrometallurgy. It caters to instructional and research needs, specifically studies in electrowinning, electrorefining, electroplating, corrosion and electromigration. It is equipped with a potentiostat/ galvanostat and constant voltage sources.

Pilot Plant
The Pilot Plant offers a small-scale look at mineral processing and metal extraction technologies on an industrial level. Equipment such as jaw crushers, ball mills, flotation cells, gravity concentrators, thickeners, and sieves help ensure that the research projects such as clean minerals processing and extractive metallurgy processes come to fruition. The Pilot Plant offers comminution, gravity concentration and flotation tests for researchers from large-scale and small-scale mining companies.

Adaptive Metallurgy Laboratory
The Adaptive Metallurgy Laboratory houses equipment such as a pelletizer, pneumatic press, and furnaces for metal heat treatment up to 1000°C ,as well as for drying, that are mainly used for the modification of properties of metals in order to make them suitable for various applications. The laboratory mainly caters to students in laboratory classes, as well as for researches involving metal property modification.

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Mining, Metallurgical and Materials Engineering

University of the Philippines Diliman

Energy Engineering Program

Providing solutions to the energy sector through world class expertise, competent scientists and engineering graduates, and relevant energy-related research and development.

The Energy Engineering program at the University of the Philippines College of Engineering was instituted in 1983 with the objective of training specialists who will:

- Develop indigenous sources of energy;
- Improve the efficiency of energy utilization, and; introduce appropriate energy technologies.

The program was envisioned to be multi-disciplinary with lecturers and thesis/dissertation advisers from among the faculty of the different departments of the College of Engineering.

The curriculum was revised in 2009 to provide a responsive and comprehensive knowledge base that will enhance the expertise of researchers, engineers, and scientists in developing and managing applied energy technologies and in developing analytical tools for energy planning; to effectively transmit critical technical and policy-oriented knowledge to support institutions, and; to meet the demands of the dynamic and complex character of an evolving energy sector within a competitive and market-based framework.

Vision

A regional hub for energy knowledge and technology and a pro-active contributor to the country's progress toward energy security and sustainable development.

Mission

To engage in energy research and development of regional and national relevance; to produce solutions-oriented leaders in the energy sector, and; to provide expert advise on energy issues of regional and national interest.

Graduate Degree Programs

MS in Energy Engineering
Ph.D. in Energy Engineering

Research Thrust

Energy Modelling and Policy-making
Energy Efficiency and Conservation
Renewable Energy (Solar, Wind, Hydro, Biomass, Ocean, Geothermal)
Alternative fuels (Biofuels, CNG, Autogas)
Indigenous Fossils Fuels (low quality coal, natural gas, oil)
Nuclear Energy and Emerging Energy Technologies

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Energy Engineering

Facilities

The Energy Engineering conducts its laboratory work and experiments within the 5 laboratories of the multi-disciplinary units that support it.

At present, the program is supported by the:

- Fuels, Energy, and Thermal Systems Laboratory (Chemical Engineering Department)
- Power Laboratory, Alternative fuels (Mechanical Engineering Department)
- Solar Photo-voltaic Laboratory (Electrical and Electronics Engineering Institute)
- Geographic Information Systems Laboratory (GISL) (Geodetic Engineering)
- IE/OR Computing Laboratory (Industrial Engineering)

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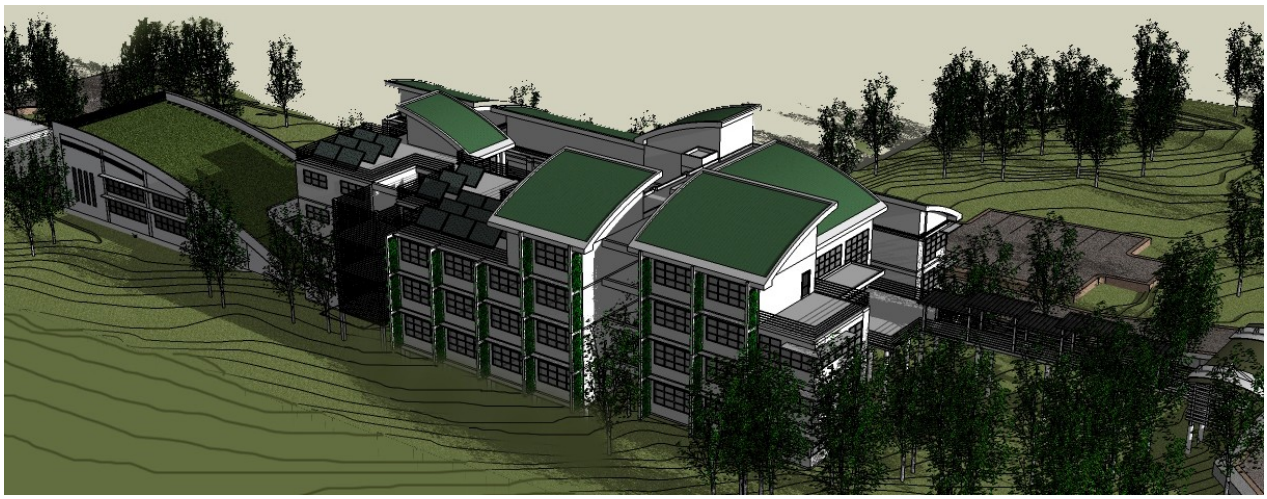

Environmental Engineering Program

A leading academic institute in the Asia-Pacific region for environmental engineering research and technology innovation that serve the nation and improve the quality of life.

Established in 1973, the Environmental Engineering Graduate Program is a trans disciplinary and multi-departmental research and academic unit intended to provide advanced environmental engineering studies. The participating departments/institutes from the College of Engineering are Chemical Engineering (ChE), Civil Engineering (CE), Computer Science (CS), Geodetic Engineering (GE), Industrial Engineering (IE), Mechanical Engineering (ME), and Mining, Metallurgical and Materials Engineering (MMME).

Mission

- To provide excellent graduate environmental engineering education that promotes responsible stewardship of the Earth's resources
- To generate knowledge and innovations that address challenges in striking a balance between serving humanity and protecting the environment.
- To promote proactive, interdisciplinary and multi-sectoral initiatives that respond to local and global environmental problems.

Graduate Degree Programs

MS in Environmental Engineering
Ph.D. in Environmental Engineering

Five (5) Major Research Tracks

Water Quality Management,
Air Quality Management
Solid Waste and Hazardous Materials Management
Geoenvironment Quality Management
Environmental Systems Engineering

It is the host institution for environmental engineering under the ASEAN University Network/ Southeast Asia Engineering Education Development Network (AUN/SEED-Net/JICA) within the ASEAN region.

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Facilities

The Environmental Engineering Program has been involved in research works on processes and systems that address air, water and soil pollutants. Research works in environmental process engineering deal with the sources, transport, transformation, fate and impact of contaminants in the environment and the development of upstream and end-of-pipe technologies that minimize pollution.

Research themes include:

- Chemical and physical processes for the treatment of recalcitrant compounds and emerging contaminants
- Biological process systems for air pollutants, industrial wastewater and slurries, petroleum contaminated soil and groundwater
- Conversion of solid and liquid wastes to material and energy resources
- Physical, chemical and biological processes that determine the fate of pollutants in the environment
- Sensing systems for monitoring levels of pollutants in the environment
- Clean technology for chemical process industries

Environmental Engineering

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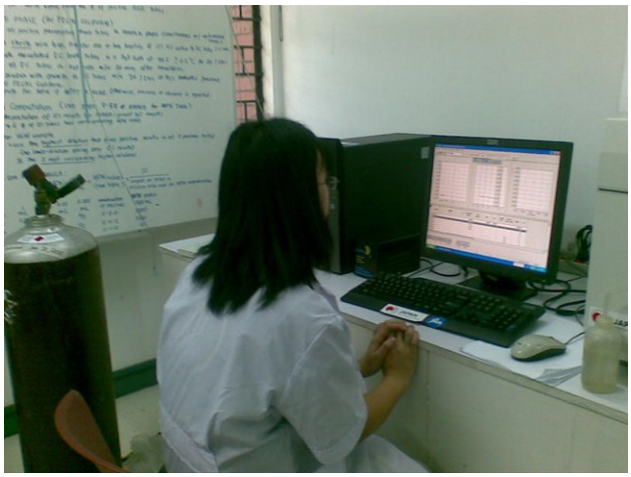

SCHOOL OF SCIENCE AND ENGINEERING

The Ateneo de Manila University is a Filipino, Catholic and Jesuit institution of higher learning incorporated and operating under the laws of the Republic of the Philippines, the Catholic Church and the Society of Jesus. The University is composed of School Units that consist of component schools. The main tertiary unit of the University is the Loyola Schools and the Loyola Schools is composed of four schools namely School of Humanities, School of Science and Engineering, School of Social Sciences and the John Gokongwei School of Management.

The School of Science and Engineering (SOSE) is composed of eight departments that are varied in their specialization but united in their intent to prioritize environment, disaster science and mitigation, health and science education. These are the Departments of Biology, Chemistry, Electronics, Computer and Communications Engineering (ECCE), Environmental Science, Information Systems and Computer Science (DISCS), Health Sciences, Mathematics and Physics. Two of these departments (Biology and Environmental Science) are CHED Centers of Development and four (Chemistry, Information Systems and Computer Science, Mathematics and Physics) are CHED Centers of Excellence.

The two departments of SOSE under the Engineering Research and Development for Technology (ERDT) are ECCE and DISCS. ECCE offers a Master of Electronics Engineering, which is a science-based and research-oriented engineering program with workshops, and laboratories where students learn advanced engineering skills.

Ateneo de Manila University

Advanced research and computer laboratories such as Instrumentation and Control Laboratory equipped with MatLab, National Instruments and Synopsis design tools and IPTV research laboratory, among others, cater to the research needs of both undergraduate and graduate students. The Department likewise provides an arena for students to innovate by doing research in exciting areas that include collaborative research with industry applications, thus making academic research relevant to the needs of the industry. Major research thrusts are in Biomedical Devices and Subsystems, Telecommunications and Networked Information's Systems, Microelectronics and Energy-Environment. The multiyear projects use combined skills in computer engineering, programming and communications, and advanced circuit design as well as the soft-people skills required to work in large multi-disciplinary teams.

DISCS, is a CHED Center of Excellence offering a Master of Science in Computer Science and a Doctor of Philosophy in Computer Science. The Master of Science in Computer Science is a research oriented program and consequently requires full-time study. The Doctor of Philosophy in Computer Science is a research-oriented program for students who intend to pursue careers in computer science research and education. DISCS is actively engaged in research in the areas of Computer Theory and Algorithms, Affective Computing, Social Computing, Pedestrian and Traffic Computing, Mobile Computing, Management Information Systems, and Instructional Technology and Multimedia. The Ateneo Java Wireless Competency Center (AJWCC), Ateneo Laboratory for Learning Sciences (ALLS), and the Ateneo Social Computing Science Laboratory (SCS) provide venues that are conducive for faculty and students to intensively work on their research. In collaboration and partnership with industry players and practitioners, local government units, and non-government organizations, DISCS through AJWCC provide information and communications technology solutions for development.

ERDT Supported Graduate Program Offered by

Department of Information Systems and Computer Science (DISCS)

MS Computer Science (MS CS)
Ph.D. Computer Science (PHD CS)

Department of Electronics, Computer and Communications Engineering (ECCE)

MS Electronics Engineering (EcE)

Research Centers

Aside from the numerous state-of-the-art laboratories for research work, graduate students have the opportunity to collaborate with the following Centers:

Ateneo Java Wireless Competency Center (AJWCC)

The AJWCC was setup to create a competency center for wireless technologies to help steer the Philippines into a global net economy. It also aims to develop the nation to become a leading info-communications technologies (ICT) hub in the Asia-Pacific region.

Ateneo Innovation Center (AIC)

AIC is the foremost research organization within Ateneo that aims to promote innovations through multidisciplinary teaming and strategic long-term partnerships with the industry and the government. The AIC envisages an Ateneo tightly coupled with the community and the nation, helping in the innovation of novel products, systems and services that address national necessities.

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Department of Electronics, Computer and Communications Engineering

Department of ECCE offers an excellent graduate program in Engineering. The research oriented program is designed to extend mastery of theories and applications, and encourage high-impact innovative research in emerging areas.

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Facilities

Hitachi – Metrology and Robotics Laboratory
Established through donations of advanced robotics, surface measurement, and microscopy instrumentation by HitachiGST; the cost of the donated equipment is about US$ 2M. The facilities will be used for training and research in Materials Science and Engineering, Electronics and Computer Engineering, and the sciences (Chemistry, Physics, Biology, and Environmental Sciences).

Broadband Access Technologies Laboratory
These are lab facilities the highlight the use of high-speed information networks and services. The labs include (a) the Ateneo-PLDT Advanced Network Testbed, (b)SMART-SWEEP Mobile Wireless Lab, (c) Network Testing Lab for WiFi, RFID, and optical communications, and (d) Satellite Communications Lab which was set-up through a Philippines-Japan POST-PARTNERS program.

Electronics Laboratory
This is used in Circuits, Analog electronics, Feedback & Control and related courses. Equipped with tables complete with power supply, oscilloscopes, function generators, multi-meters, computers for simulations. This lab can accommodate 16 to 20 students per session.

Digital and Microprocessor Laboratory
This is used for Digital electronics, Microprocessor Systems and related courses. Equipped with logic probes, multi-meters, function generators, frequency counters, computers for simulations & programming. This lab can accommodate 16 to 20 students per session. This is an open laboratory. The laboratory exercises are non-traditional lab. The students are given problems to solve using their current knowledge level. See attached lab manual.

Engineering Workshop
Use for doing workshop related activities equipped with drill press, bending machine, soldering station, etc. This room can accommodate 12 to 16 students per session.

Digital Signal Processing Laboratory
For DSP related activities. Equipped with TI donated DSP processors. This room can accommodate 12 to 16 students per session.

Satellite & Telecommunications Laboratory
For Telecomms related activities. Equipped with DSOs, spectrum analyzer, function generators, programmable pulse generator, instrumentation amplifiers, telecoms kit, multimeters, etc. This room can accommodate 12 to 16 students per session. This lab also uses the open laboratory format

Mobile Wireless Laboratory
The SWEEP Lab (Smart Wireless Engg Education Program) is a research lab for students working on research projects related to wireless mobile communications. It houses various pieces of equipment such as wireless broadband equipment for providing enhanced technical and hands-on training to faculty members and students. Co-located inside the lab is a working GSM cell site that provides additional wireless mobile network coverage inside the campus.

Microelectronics Laboratory
Researches related to High level design using HDL (Verilog HDL and VHDL). Product prototyping using FPGAs and microcontrollers, Firmware development are done here. Skills and training in microelectronics technology – IC design using FPGA devices and state of the art synthesis and design tools.

Computer Laboratory
Houses the simulation, programming and computer, interfacing related courses. It contains 24+networked computers.
Can accommodate at least 24 students.

IPTV

The state-of-the-art facility that seeks to serve as an IPTV research lab where interactive media and services across numerous platforms, content creation, and sharing over the Internet can be developed. The new laboratory is equipped with video encoders for IPv6, digital broadcast TV transmitters with handset and tablet receivers. It also features Apple TV and Google Chromecast, with the newly conceptualized “near cloud” servers operating seamlessly. With the convergence of multiple platforms of information delivery expected to produce a rich diversity of content, telecommunication carriers, content creators, and online service providers will find the facility an exciting place to collaborate.

Visit **iptv.ateneo.edu** for the latest on IPTV Research in the Philippines.

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Seven Lakes Aquaculture Project

Lead: Dr. Nathaniel Libatique

AIC contributed to the development of the Seven Lakes Project sponsored by TTC Japan and the NTT West. Bringing together team members from NECTEC Thailand, NARO Japan, DOST - TELOF, and Industry Partners like Alsons Aquaculture, the Ateneo researchers deployed several innovations in fish kill monitoring. Today the activities on the lake activities and health can be monitored in sites in Thailand, Japan, and Manila.

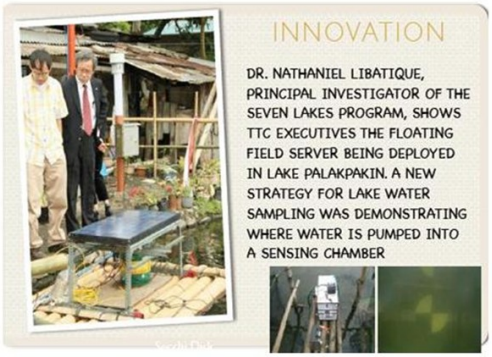
NEAR REAL-TIME DATA FOR DISSOLVED OXYGEN, TURBIDITY, FISH ACTIVITY, WEATHER, LAKE WATER TEMPERATURE, AND UPDATES ON FISH PRODUCTION AND FEEDING TECHNIQUES AVAILABLE ONLINE.

Broadband Wireless Sensor System and Knowledge Capture

The Ateneo team had several multi-department deployments to Lake Palakpakin. Students and Faculty from ASoG, SoSS, and SOSE interacted with local fisherfolk to capture the challenges and the history of life on the Lake, their hopes for success in aquaculture despite the challenges of climate change, and the role of new technology to enhance their ability to cope with the ever more complex life of the base of the pyramid.

Innovations on the Lake

Researchers deployed a floating field server prototype which, when fully developed, will measure the temperature, turbidity, pH, dissolved oxygen at different depths, and underwater images, while roaming the lake. The system is power by a solar panel, radiator fans provide the propulsion, remote control uses RC toy parts. The floating server is connected to the broadband wireless network with an onboard router, so near real time data can be delivered over the Internet.



Ateneo de Manila University

Department of Information Systems And Computer Science (DISCS)

DISCS is a CHED Center of Excellence. Its CS and MIS programs are the first and only IT programs in the Philippines that have been accredited to Level 4 status by PAASCU.

CS Theory: Research on different algorithms and data structures for solving computational problems with practical importance. The areas of medical informatics, bioinformatics, and malware detection and classification are the current focus of the research group.

Affective Computing: Concerned with the creation of systems that can detect, respond to, or exhibit human emotion, moods, and feelings. A multidisciplinary field, it draws its theoretical basis from machine learning, data mining, ergonomics, cognitive psychology, and others.

Mobile Computing: Through the Ateneo Java Wireless Competency Centers, students partner with business and other organizations to develop new mobile and eLearning applications to the marketplace or to integrate wireless solutions with their products and services.

Pedestrian and Traffic Computing: Research and development of algorithms for multi-agent simulation and sensory devices used in collecting data and tracking agents. The developed systems are used to analyze and solved pedestrian and traffic network problems related to business, public safety and evacuation.

Grid Computing: Research and development on ways to pool the computational power of individual computers to solve scientific and business problems.

Instructional Technology/Multimedia: Investigations in to the role and uses of technology in the delivery of educational content and the fostering of meaningful interactions among teachers and learners.

Management Information Systems: Research on knowledge management, learning organizations, and role of technology in meeting the changing needs of industry and governance.

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The Ateneo Java Wireless Competency Center (AJWCC) of the Department of Information Systems and Computer Science (DISCS) allows students to partner with business and other organizations to develop new mobile and eLearning applications to the marketplace or to integrate wireless solutions with their products and services.

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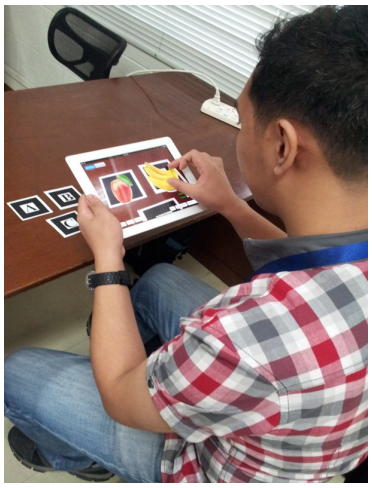

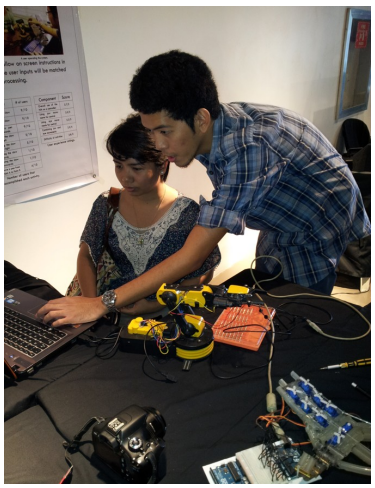

COLLEGE OF ENGINEERING

The College of Engineering (CEn) started as a department, the Department of Agricultural Engineering offering a secondary Farm Mechanics Course in the then Central Luzon Agricultural School (CLAS).

In June 1955, five years after the school was elevated into Central Luzon Agricultural College (CLAC), the Department was expanded to include the offering of a 4-year curriculum in Bachelor of Science in Agricultural Engineering (BSAEn). Later in 1959, this curriculum program was revised into a 5-year BSAEn program. This program was declared one of the only two centers of excellence in the country today.

When CLAC was converted into what is now the Central Luzon State University (CLSU) through R.A. No. 4067 of 1964, the Department of Agricultural Engineering became the College of Engineering.

Over the long years, the CEn has carved a name for itself. Its graduates have excelled in the board examinations for engineers and have occupied key management positions on which they have earned national and international recognitions for their outstanding works. All these achievements have contributed to the high reputation of the College.

To date, the CEn offers a variety of degree courses both in the graduate and the undergraduate levels. The CEn started offering the Bachelor of Science in Civil Engineering degree program in 1984. In addition, the CEn began to offer the Bachelor of Science in Information Technology in 2001 to produce graduates with professional competency and knowledge in information technology. Its Bachelor of Science in Meteorology which started in 2012 is the latest addition to its degree offerings. A certificate in Agricultural Mechanics is likewise offered by the College.

- The graduate programs of the Department of Agricultural Engineering leading to the Master of Science and Doctor of Philosophy in Agricultural Engineering have been offered since 1978 and 1984, respectively, under the Institute of Graduate Studies. With the verticalization of academic programs in the university, the graduate programs is now being offered under the College of Engineering starting the first semester of academic year 2013-2014.

CEn is one of the eight colleges in the Central Luzon State University. It has remained an important center of higher learning and scientific research, keeping pace with the University and the national thrusts.

Goals of the College of Engineering

In line with the mission of the University, the goals of the College of Engineering are:

- To provide quality education and applies knowledge in engineering and technology that is proactive of future and relevant agro-industrial needs in preparation for and furtherance of global practice;
- To engage in research with high socio-economic impact and contribution towards sustainable development, and reports on the results of such researches; and,
- To bring to the community and stakeholders the vast store of knowledge and technology in order to make the Philippines and the world a better place.

The Agricultural Engineering Graduate Program

The AE graduate program is designed to produce professionals that have a thorough understanding of advanced engineering principles in the areas of Soil and Water, Agricultural Machinery, and Crop Processing

Goals of MS Program

Graduates are expected to acquire increased professional experience over the course of their graduate program, so that they can be prepared for a successful career through their coursework and the development of a research project.

Graduates should be capable of applying knowledge of natural, physical, and engineering sciences to formulate problem statements, design experiments, test hypotheses, and solve problems in agricultural engineering.

Goals of Ph.D. Program

Have similar outcomes as the M.S. graduates, but with an emphasis on a deeper understanding of problem formulation (to be able to recognize and formulate problem statements) and higher mathematical skills.

Graduates should be able to independently conduct original research at and beyond the boundaries of current state of the art.

Graduates must have a background in a different discipline through selection of a minor area, so that they can be incorporated into interdisciplinary research teams.

Ph.D. graduates should be ready to pursue academic careers.

RESEARCH AREAS IN AGRICULTURAL ENGINEERING

Irrigation Engineering
Water Quality
Agricultural Water Resource Engineering
Soil-Water-Plant Relationships
Controlled-Environment Plant Systems
Bioreactor Design
Sensors and Control systems
Decision Support Systems
Biological Modeling
Waste Management and Pollution Control
Energy Issues
Landscape Irrigation
Biorenewable materials
Food safety
Supply chain management technology for biorenewables
Model process operations for understanding of value and efficiencies
Quantify food safety risks in processing operations
Optimize product and co-product management systems
Create integrative information systems for biorenewable supply chains
Emerging technologies related to agricultural machinery and equipment in the areas of:
Machine systems for biorenewables
Intelligent and autonomous machines
Mechatronics
Sensors
Integration of information technology (IT) in agricultural machinery and systems
Impacts of agricultural machinery on sustainability
Generate knowledge and information to prevent injuries and loss among industries and among agricultural population

Research Centers & Institutes

The following research centers and institutes are affiliated with the College of Engineering, with their heads working in double capacity as Director and faculty members of the College of Engineering:

- Water Resources Management Center (WRMC)
  Director – Dr. Armando N. Espino Jr.
- Philippine Sino Center for Agricultural Technology (PhilSCAT)
  Director – Dr. Emmanuel V. Sicat
- Affiliated Renewable Energy Center (AREC)
  Director – Dr. Victorino T. Taylan
- Information System Institute
  Director – Dr. Nemesio Macabale

University of the Philippines Diliman

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ERDT Project Leader

Department of Agricultural Engineering

Central Luzon State University

A world class knowledge-based people's university in the field of Agricultural Engineering. It is committed to service and excellence that develops socially responsible and empowered human resources and knowledge for poverty alleviation, environmental protection and global competitiveness towards sustainable development.

The Graduate program is divided into the following tracks:

- **Environment and Infrastructure**

Soil and water management, soil and water conservation, waste management, agricultural buildings and structures with automation, agricultural machinery management, crop process engineering, climate change mitigation for agricultural crop's environment.

- **Energy**

Agricultural power, renewable energy via micro and pico hydro systems, solar power for agricultural purposes, rural electrification.

The following are the research areas of concentration where graduate and undergraduate students could choose from:

- Soil and Water Management
- Agricultural Power and Machinery Management
- Crop Process Engineering
- Agricultural Structures and Environmental Control
- Farm Electrification

Agricultural Engineering

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Facilities

Soil and Materials Testing Laboratory

The SMTL is a classroom laboratory that is used for the analysis of soil's field capacity, bulk density, permeability, and moisture content among others. It also houses a Universal Testing Machine and other small devices for determining plastic limit, liquid limit and plasticity index.

Soil and Water Field Laboratory

The SWFL is a field laboratory where graduate and undergraduate researches, including faculty researches in irrigation for rice and non-rice crops are conducted. It houses three greenhouses which serve as research laboratory for controlled environment system which includes automation of its irrigation facilities by using soil moisture sensors that triggers the water applicators when needed by the crop. Simulation studies of different irrigation methods like surface, sprinkler and drip irrigation methods are also conducted in the SWFL.

Farm Machinery Laboratory

The FML serves as venue for laboratory classes and researches in both graduate and undergraduate levels in the fields of Farm Power, Machinery and Management. Design and fabrication of farm machines are undertaken in the FML. It is supported by a field that serves as venue for testing and evaluation of different farm machines.

Crop Processing Laboratory

The CPL serves as venue laboratory classes and researches in both graduate and undergraduate levels in the fields of Crop Processing and Crop Process Engineering. Design, fabrication, testing and evaluation of crop processing devices are undertaken in the CPL. It is supported by a field laboratory that houses different types of rice mills, rice grain dryer, and other crop processing equipment.

Renewable Energy Center

The REC houses the Micro-hydro Laboratory that is capable of simulating the design and performance of different sizes of turbines that are subjected to different discharge and head combinations. It also serves as venue for conducting researches on pico-hydro system. The REL also houses the Bioethanol Laboratory that is used for testing the fermentation and distillation efficiencies of producing hydrous bioethanol using different feedstocks. A sweet sorghum juicer is likewise included to serve as prototype for manufacturing it at different capacity. Gasification studies for use as fuel for heating, cooking and fuel for internal combustion engines are likewise undertaken in BL. The use of solar system for agricultural machines and equipment are also undertaken in the BL.

Hydraulics Laboratory

The HL houses different hydraulic equipment like flow measuring devices, conveyance and control structures that are used in open channels and closed conduit systems.

Agricultural Engineering

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Agricultural Engineering

GOKONGWEI COLLEGE OF ENGINEERING

The Gokongwei College of Engineering (GCOE) stands as a model institution of research, as it supports research projects that respond to the needs of both the industrialized and the rural areas in the country. It has earned recognition from reputable organizations for research conducted by faculty and students which have significantly contributed to national development.

The Gokongwei College of Engineering underscored relevant and progressive curriculum, a faculty roster of top caliber academics and industry practitioners, and modern laboratories and state-of-the-art equipment in the formation of highly-skilled, morally-grounded, and service-oriented engineering professionals.

In the bigger picture, De La Salle University is the only private Philippine university selected by ASEAN to be part of the Southeast Asian Engineering Education Network (SEED-Net). In partnership with 16 other leading universities from the region, De La Salle takes a major role in human resource development not only in the field of engineering but also in information technology.

Mission

To produce technically competent and innovative service-driven engineering leaders with integrity.

Vision

GCOE will be an internationally renowned institution highly regarded by both industry and government for generating knowledge towards sustainability and improving quality of life.

Departments and Programs

Department of Chemical Engineering
Civil Engineering Department
Electronics and Communications Engineering Department
Industrial Engineering Department
Mechanical Engineering Department
Manufacturing Engineering and Management

Ladderized Programs (Bachelor of Science and Master of Science Honors Program)

BSMS Chemical Engineering
BSMS Civil Engineering
BSMS Electronics and Communications Engineering
BSMS Industrial Engineering
BSMS Manufacturing Engineering and Management
BSMS Mechanical Engineering

Graduate Degree Programs

Master of Science (with thesis)
MS in Chemical Engineering
MS in Civil Engineering
MS in Electronics and Communications Engineering
MS in Environmental Engineering and Management
MS in Industrial Engineering
MS in Manufacturing Engineering and Management
MS in Mechanical Engineering

Master of Engineering (Non-Thesis)
M.Eng. in Chemical Engineering
M.Eng.in Civil Engineering
M.Eng.in Electronics and Communications Engineering
M.Eng.in Environmental Engineering and Management
M.Eng.in Industrial Engineering
M.Eng.in Manufacturing Engineering and Management
M.Eng.in Mechanical Engineering

Doctor of Philosophy
Ph.D. in Chemical Engineering
Ph.D. in Civil Engineering
Ph.D. in Electronics and Communications Engineering
Ph.D. in Industrial Engineering
Ph.D. in Mechanical Engineering

Highlight

Among the biggest achievements of the College was earning the highest accreditation given by the Commission on Higher Education (CHED), with three of its programs named as Centers of Excellence. In addition, five (5) programs have been awarded PAASCU Level 4 accreditation. These are Chemical Engineering, Civil Engineering, Electronics and Communications Engineering, Industrial Engineering and Mechanical Engineering. Two of its programs, Chemical Engineering and Civil Engineering, have undergone the ASEAN University Network Quality Assessment.

De La Salle University

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Department of Chemical Engineering

The Chemical Engineering Department of De La Salle University is recognized as a hub for chemical engineering education in Southeast Asia by the ASEAN University Network / Southeast Asia Engineering Education Development Network (AUN/SEED-NET). Its undergraduate chemical engineering program is the first in the country to be awarded Level 4 accreditation (the highest) by the Philippine Accrediting Association of Schools, Colleges, and Universities (PAASCU). Students may specialize in the following research areas: Biochemical Processes / Biotechnology, Catalysis and Chemical Synthesis, Energy Engineering /Renewable Energy, Environmental Engineering, Nanotechnology and Process Systems Engineering. DLSU Chemical Engineering Department has established linkage programs with top global universities.

The Department's Graduate program is divided into the following tracks:

Biochemical Processes / Biotechnology

Production of biodiesel from microalgae, bioethanol production, fabrication and evaluation of poly-dimethylsiloxane (PDMS) mixed matrix membranes (MMMs) with surface-modified fillers for the separation of hydrocarbons and alcohols, extraction of valuable products from rice bran, mathematical modeling of biochemical processes, isolation of thermo-tolerant and high ethanol concentration tolerant yeast strains , plant and animal tissue culture

Catalysis and Chemical Synthesis

Dry reforming of methane, UV -TiO_2 catalysis, determination of suitable catalyst for carbon nanotube production, formulation of catalysts for various chemical reactions and synthesis, metal doping of TiO_2 catalysts, production of nano-TiO_2 using sol gel method, micro-encapsulation of nanocatalysts.

Energy Engineering / Renewable Energy

Biodiesel, nonconventional catalyst for biodiesel production, clean coal technology, energy conservation using pinch technology, life cycle analysis of energy production systems, microwave technology applied to waste treatment and to production and processing of materials, sustainable energy production and utilization; rapid devolatilization of pulverized hydrocarbon resources using a thermobalance reactor system; a comparative study on the energy recovery of different types of Philippine coals, anaerobic digestion of market waste, characterization of pyrolysis coal by means of thermal analysis; thermogravimetric analysis of fine particles of *E. Delegatensis* Wood; intraparticle heat and mass transfer processes during pyrolytic decomposition of wood; fuel characteristics of briquettes from waste coffee pulp and hulls and other researches in energy related fields.

Environmental Engineering

Biological wastewater treatment, hazardous wastewater treatment, air quality management; wastewater treatment; hazardous wastes management, solid, toxic and hazardous waste management and treatment, multi-criteria decision analysis in environmental and energy systems (consensus-seeking decision modeling), nutrient removal using microalgae, hazardous waste and persistent organic chemical treatment using biofilms, hazardous chemical waste treatment using zero-valent iron, waste water treatment using UV-TiO_2 and advance oxidation processes, climate change adaptation and sustainability researches.

Nanotechnology

Production of nanotubes using microwave induced plasma, utilization of carbon nanotubes in the formulation of dye sensitized solar cells, mathematical modeling and simulation of nanomaterial production process, material science and engineering (X-ray microtomography), graphene production

Process Systems Engineering

Process simulation and control, process optimization, process design, pinch technology, life-cycle modeling of energy and industrial systems, theoretical and computational aspects of life cycle assessment, process integration and pinch analysis for industrial pollution prevention and resource conservation, novel applications of pinch analysis, environmental informatics, modeling and decision support systems, swarm intelligence and soft computing applications in process systems engineering.

Separation processes

Supercritical fluid extraction, solution thermodynamics, microwave assisted extraction process

Research Facilities

Graduate and undergraduate students are assigned to research groups and laboratories, which cater to diverse interests and specializations. The Chemical Engineering Department maintains the following instructional and research facilities:

Biochemical Processes Laboratory

The Biochemical Process Laboratory (STRC 216) has become a prominent and essential component in the training to provide extensive experience to our ChE undergraduate students as well as graduate students (both MS and PhD) who are working on biomolecules and biological process involving biochemical principles, techniques, and skills. It is also our department's venue for multi disciplinary fields: "Engineering the Life Sciences". These fields involves application of engineering principles in the field of biochemistry, molecular biology, genetics, cell biology, microbiology, bio & biological process technology, food technology, membrane separation, among others. The Biochemical process laboratory houses the basic laboratory equipment as well as some specific equipment for the conduct of the following research areas: (1) biosynthesis of important biochemicals, of industrial and pharmaceutical importance using different extraction techniques; conversion of different biomaterials to bioenergy, bioethanol, biodiesel, and many more; (2) Waste treatment using different bioprocess technology.

Catalysis Laboratory

This research laboratory is engaged in researches on developing catalysts useful for both industrial processes and environmental protection. It houses a flow reactor system for testing activity of catalysts. It also contains different catalytic reactors such the fixed bed reactor, spinning basket reactor and fluidized bed reactor.

Chemical Engineering Research Laboratory

Within the Chemical Engineering Research Laboratory, students from undergraduate groups to those finishing their MS or PhD thesis, are exploring possibilities in making significant research contributions in the realm of Chemical Engineering such as in Biotechnology, Corrosion Engineering, Material Science and Engineering, Environmental Engineering, and Energy Engineering. The Lab is equipped with analytical instruments such as Gas Chromatograph, Atomic Absorption Spectrophotometer, and Total Organic Carbon (TOC) Analyzer, as well as several important research devices such as Heidolph Rotary Evaporator, Sohxlet Extraction Unit, Kjeldahl Nitrogen Digesting and Distilling Apparatus, Potentiometer/Galvanometer, and MaxQ 4000 Shaker.

The researches in this laboratory are varied and multidisciplinary. Some researches done in this laboratory include the production of carbon nanotubes, production of biodiesel from algae, CO_2 capture and fixation by conversion to algal biomass production, graphene production, dye sensitized solar cells (DSSC). Biological nutrient removal, biogas production, production of bioethanol from lignocellulosic biomass and readily fermentable sugars using acclimatized yeast strains, vacuum fermentative distillation and arsenic removal using laterite soil.

Chemistry Laboratory

The GCOE Chemistry laboratories have a laboratory for General Chemistry, Organic Chemistry, Analytical Chemistry and Physical Chemistry. These specific laboratories are well-equipped with the necessary instruments, apparatus, and materials needed for instruction and research. Among the equipment that are available in the Chemistry Laboratories that can be used for both instruction and research are UV- Vis spectrophotometer, solution calorimeter, bomb calorimeter, polarimeter, refractometer, Du-nouy tensiometer.

Energy Engineering Laboratory

Energy Engineering Laboratory covers research on energy from renewable and non-renewable resources by gasification, pyrolysis, and combustion. Part of the researches undertaken in this laboratory is clean coal technologies and transesterification of different feedstocks for the production of biodiesel. The laboratory house TGA, Microwave Trainer and other equipment necessary for energy characterization and analyses.

Environmental Engineering Laboratory

Environmental Engineering Laboratory supports the environmental engineering researches of the department. Environmental Laboratory includes researches on water and wastewater treatment using electrocoagulation, electrolysis, nanotitania/AC composite catalyst, and zero-valent iron processes. While the general research fields are on air, water and solid waste management, some environmental Engineering Researches are specializing on Life Cycle Assessment, Process Integration and Process Systems Engineering, Environmental Decision Support Systems, Wastewater Engineering, Toxic and Hazardous Waste Treatment and Management.

Process Control Laboratory

The Process Control and Simulation Laboratory is primarily dedicated to facilitate instruction to undergraduate chemical engineering students in the area of process control and dynamics. It could also be used for graduate and undergraduate researches on this field It contains a temperature control model plant and several Armfield basic process module table top units to demonstrate controls in real time application. The computers contain programs like SuperPro software to help students in process simulation. The equipment found in this laboratory includes, WYKO NT3300 Optical Surface Profiler and stereo microscopes, Temperature Control Model Plant, Armfield process control trainer, Armfield process control modules and state of the art Data Acquisition System from National Instruments. Some researches are related to process systems engineering such as mathematical modeling and control of carbon nanotube production process through microwave induced plasma.

Unit Operations Laboratory

The Unit Operations Laboratory serves the needs of undergraduate students in chemical engineering who are enrolled in laboratory courses in unit operations. Typical experiments performed in the Unit Operations Laboratory cover topics in fluid mechanics (such as pump characteristics and fluid agitation), heat transfer (such as radiation), mass transfer operations (such as diffusivities, binary distillation, gas absorption, humidification, drying, adsorption), mechanical separation (such as filtration, screening, size reduction), and other

related topics like reaction engineering (such as plug flow or tubular reactor). Because of the general nature of the experiments that can be done using the equipment in the Unit Operations Laboratory, routine sample preparation and separations, as part of preliminary procedures in research, are often performed here. Some of the experimental research investigations by graduate and undergraduate students are performed in this laboratory, such as research on CO_2 capture and fixation.

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Facilities

The Chemical Engineering Department is equipped with various state-of- the art equipment for research and instructional purposes as presented above. Aside from the chemical engineering laboratories, the department has access to equipment and research facilities from various departments of the Gokongwei College of Engineering such as the Mechanical Engineering Laboratories, Electronics Engineering Laboratories, and Civil Engineering Laboratories. Industrial Engineering Laboratories and the Manufacturing Engineering laboratories. It has also access to various research equipment from the laboratories of the College of Science such as the Biology Department laboratories, Chemistry Department laboratories and the Physics Department Laboratories.

The department has links with international universities through research collaborations such as Tokyo Institute of Technology, University of Tokyo, Waseda University and other Japanese Universities. We also have strong links with ASEAN Universities such as NUS and NTU in Singapore, HUST and HCMUT in Vietnam, CU in Thailand and other ASEAN Universities through the AUN SEED Net. Through these collaborations the Chemical Engineering Department have access to some of their state of the art research facilities.

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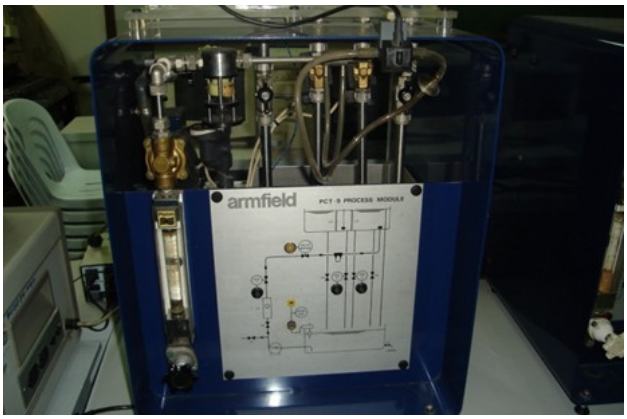
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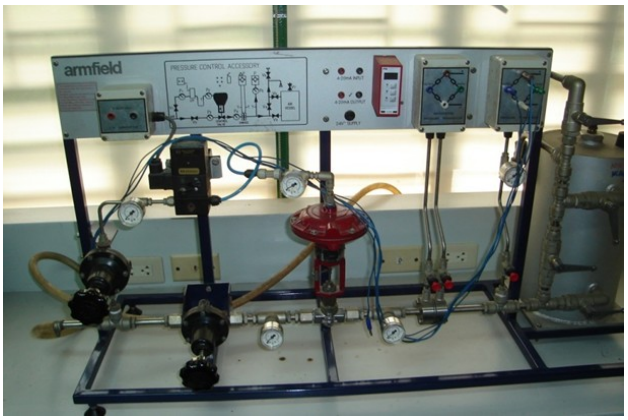
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Civil Engineering Department

Addressing specialized Civil Engineering problems on sustainability and natural disaster risk mitigation.

The Graduate Studies in Civil Engineering aims to train professional civil engineers who can contribute solutions to specialized problems in civil engineering especially related to contemporary issues on sustainability and disaster risk.

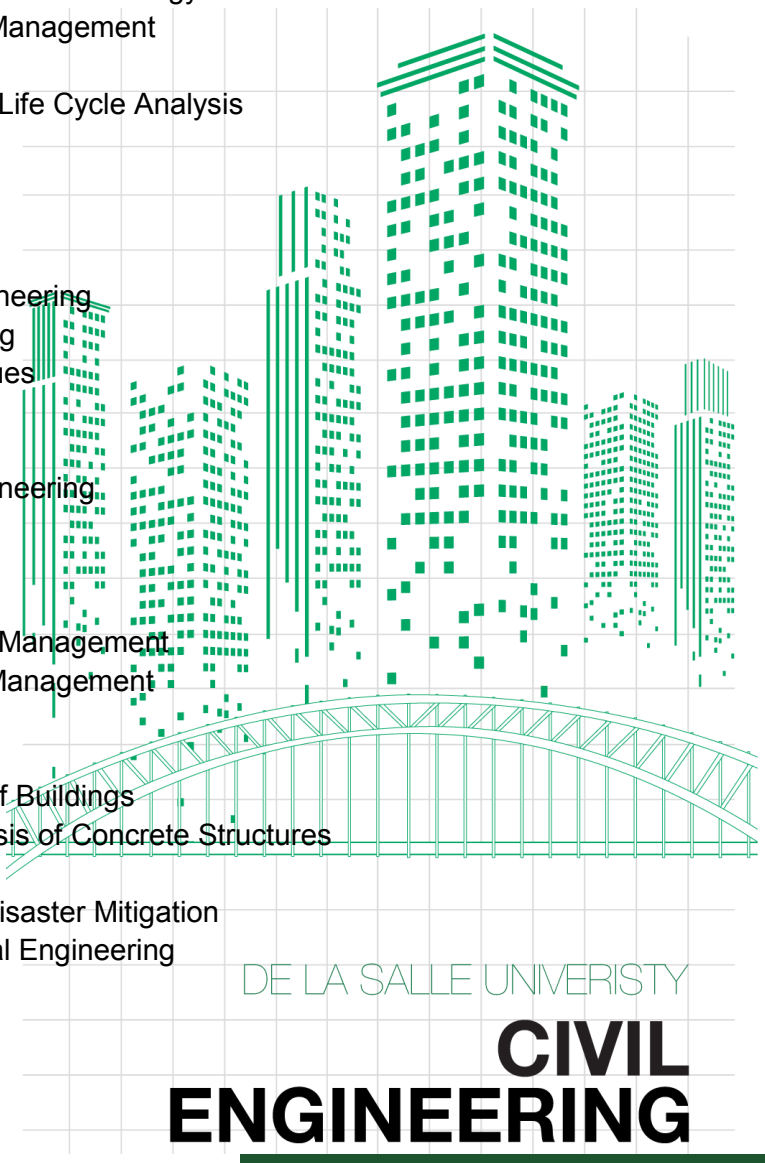
The Civil Engineering Graduate program has five fields of specialization, namely: (1) Construction Technology and Management, (2) Geotechnical Engineering, (3) Structural Engineering, (4) Transportation Planning and Engineering, and (5) Hydraulics and Water Resources Engineering:

Construction Technology and Management
- Advanced Construction Engineering
- Advanced Concrete and Materials Technology
- Construction Safety and Risk Management
- Construction Problems
- Sustainable Infrastructure and Life Cycle Analysis

Geotechnical Engineering
- Advanced Soil Mechanics
- Advanced Geomechanics
- Geotechnical Earthquake Engineering
- Geo-Environmental Engineering
- Ground Improvement Techniques
- Slope Stability Analysis

Hydraulics and Water Resources Engineering
- Advanced Hydrology
- Advanced Hydraulics
- Ground Water Development
- Water Resource Planning and Management
- Wastewater and Solid Waste Management

Structural Engineering
- Seismic Analysis and Design of Buildings
- Advanced Modeling and Analysis of Concrete Structures
- Advanced Steel Structures
- Earthquake Engineering and Disaster Mitigation
- Applied Computing in Structural Engineering
- Advanced Bridge Engineering



De La Salle University

Transportation Planning and Engineering

- Urban Transportation Planning for Philippine Cities
- Public Transit Management and Operations
- Intelligent Transportation Systems
- Advanced Modeling Applications in Transportation
- Transportation Logistics
- Transportation Policy, Strategy and Management

Note: The courses are not limited to what are listed above.

The Civil Engineering department has laboratories for each of its field of specialization. Its more modern equipment include total station equipment for surveying, direct shear apparatus, oedometer apparatus, universal multi-purpose testing machine for soils, UTM, load and displacement transducers, data loggers for structures, and hydrology apparatus, fluid channel, fluid friction apparatus for water. State-of-the-art software such as ETABS, SAP2000, CSI, Section Builder and other ACECOMS software for structural engineering, Primavera for construction technology and management, STELLA software for systems modeling, and EMME3, DYNAMEQ, JICA STRADA3, HCS+7F and ARCGIS for transportation planning and engineering, MAPINFO for geotechnical engineering are available in the computer laboratories.

Faculty Profile

The Civil Engineering department at De La Salle University-Manila is proud to offer the Civil Engineering Graduate Program given under its faculty roster of ten full-time Ph.D. degree holders, the research and publication track record of its faculty, the up-to-date research equipment and facilities under its wing, and the numerous library resources and state-of-the-art civil engineering software under its safekeeping. The Department also has very strong linkages with Japanese and ASEAN universities especially in collaborative research and training in Civil Engineering.

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Facilities

Surveying Laboratory

Experiments are performed in the field. Students learn about elementary and higher surveying; the use of surveying instruments, laying out simple, compound, reversed, spiral and vertical curves; and the different techniques in laying out curves in cases of interventions in the field.

List of major equipment/ software used in laboratory:

- Total Station and various survey instruments

Structural and Material Testing Laboratory

Laboratory testing to determine the physical and mechanical properties of construction materials like concrete and steel, casting and destructive testing of beams. Also used to conduct various research works on structures and construction materials.

List of major equipment/ software used in laboratory:

- Universal Testing Machine (UTM)
- Compression and Flexural testing Machine

Structural Engineering Instructional Laboratory / CE Computational Laboratory
Instructional laboratory for the concepts and theory of structures

List of major equipment/ software used in laboratory:
- Test Frames for classroom demonstration of different types of structures.
- Software : ETABS, SAP2000 for structural analysis, installed in computer room at V301

Soil Mechanics Laboratory
For the conduct of laboratory experiments on soils' index properties, moisture content, Atterberg limits, grain-size analyses, compaction, permeability tests, seepage analysis, shear strength, consolidation and slope stability analysis.

List of major equipment/ software used in laboratory:
- Triaxial Machine
- Direct-Residual Shear Apparatus
- Front Loading Oedometer
- Uniframe
- Software : SEEP/W for seepage analysis, SLOPE/W for stability analysis

Construction Technology and Management Laboratory
The laboratory discusses construction management and their applications, project planning, scheduling, monitoring and control

List of major equipment/ software used in laboratory:
- Software : PRIMAVERA at V103

Transportation Laboratory
Laboratory exercises will be performed mostly outside the DLSU campus observing the traffic phenomenon and other transport facilities.

List of major equipment/ software used in laboratory:
- Radar Gun for measuring speed of vehicle.
- Software : EMME software, HIGHWAY CAPACITY software, and DYNAMEQ software

Flow Analysis and Water Resource Laboratory
For the conduct of experiments on Fluid Properties; Continuity, Energy, Momentum Concepts, Bernoulli's Theorem and Applications, head loss due to friction, open channel flow visualization, rainfall-runoff simulations, and groundwater simulations

List of major equipment/ software used in laboratory:
- Hydrology Apparatus
- Flow channel
- Fluid Friction Apparatus
- Hydraulic bench
- Pipe Network Apparatus

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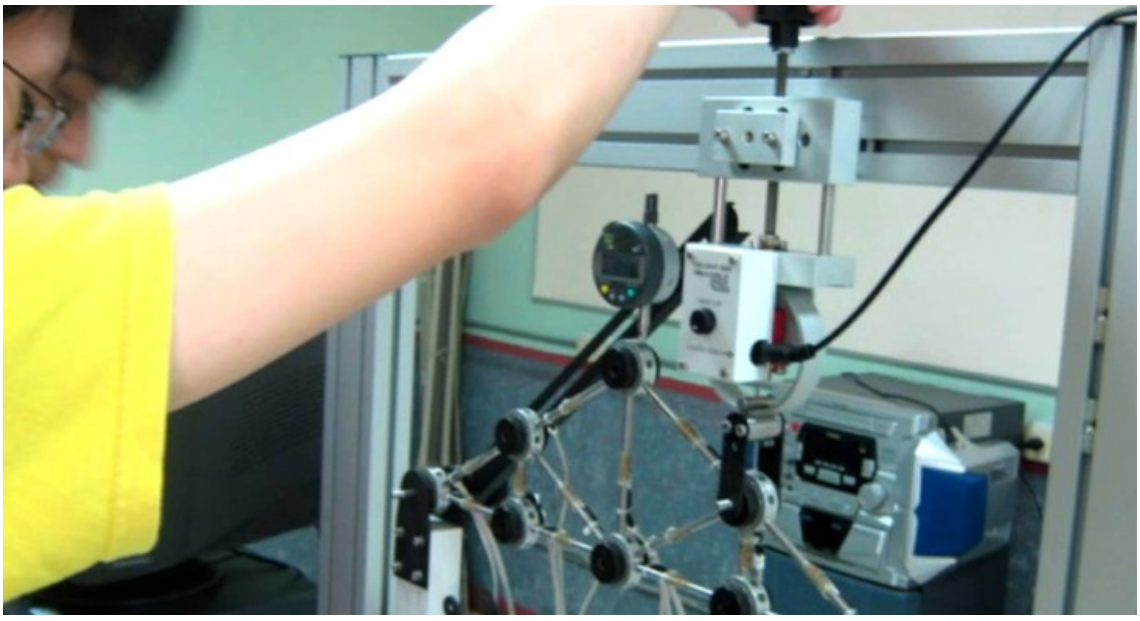
Civil Engineering



Electronics and Communications Engineering Department

DLSU ECE Department molds and nurtures ECE professional engineers to live the La Sallian values of Religio, Mores and Cultura; to be committed to the improvement of the Filipino's quality of life; to be devoted to the standards and dignity of the ECE profession; and to have a strong sense of nationalism responding to needs of the country and its people.

Research Interest

Our graduate programs offer four fields or areas of specialization:

- Communications and Networks,
- Signal Processing,
- Microelectronics Engineering, and
- Bio-informatics/Robotics/ICT.

Research in any of these areas may be undertaken by graduate students to fulfill the requirements of the respective degree program.

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Microelectronics Lab

The Microelectronics Lab was created to equip the DLSU students with hands-on knowledge in the field of IC Design and Embedded Systems. This lab aims to promote and to develop the technical skills and capabilities of DLSU students in the field of microelectronics, IC design and embedded systems. Currently, the lab has industry standard IC design software such as SYNOPSYS and TANNER which have simulation tools for IC design, layout and verification. The lab has also Xilinx FPGA for embedded systems design

Bio-Informatics/Robotics/ICT Laboratory

In this Laboratory, researches are conducted on a number of core topics, including Soft Computing, Computational Intelligence, Bioinformatics, Robotics, Mechatronics and Vision Systems. The research areas also include breast cancer self-examination, micro-robot design, robot learning and intelligence, robot controllers, navigation, multi-agent robotic system, personal robot, humanoid robots, educational and entertainment robots, artificial creature, intelligent machine, modeling and simulation of dynamic systems.

In this laboratory, creative researches are promoted by periodic laboratory seminars and project meetings, proposed theories and ideas are validated by implementing in manufactured robot system and external projects, and updated technologies and information are exchanged through related international conferences.

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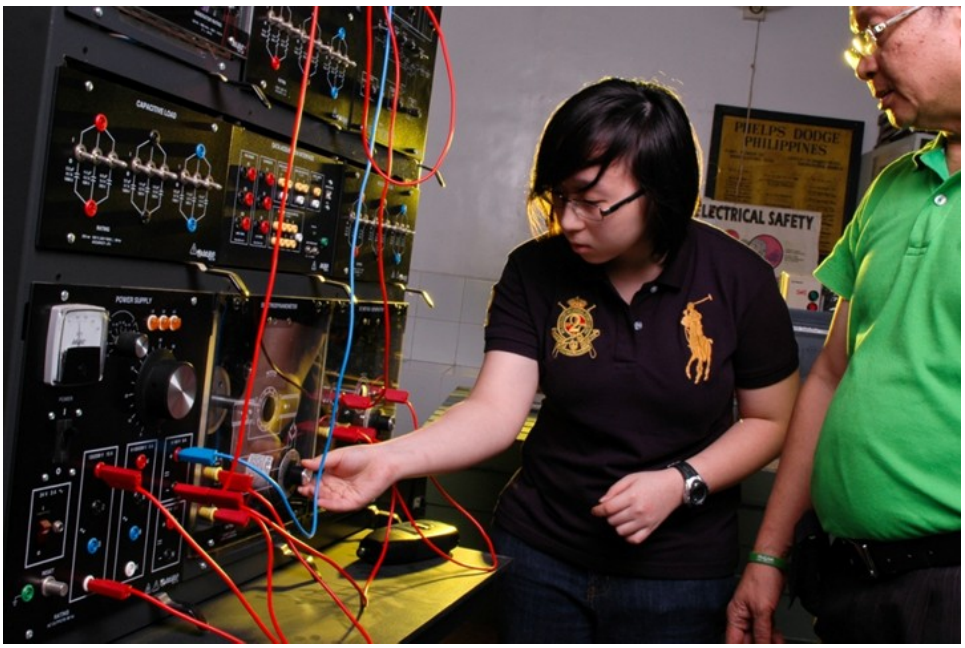

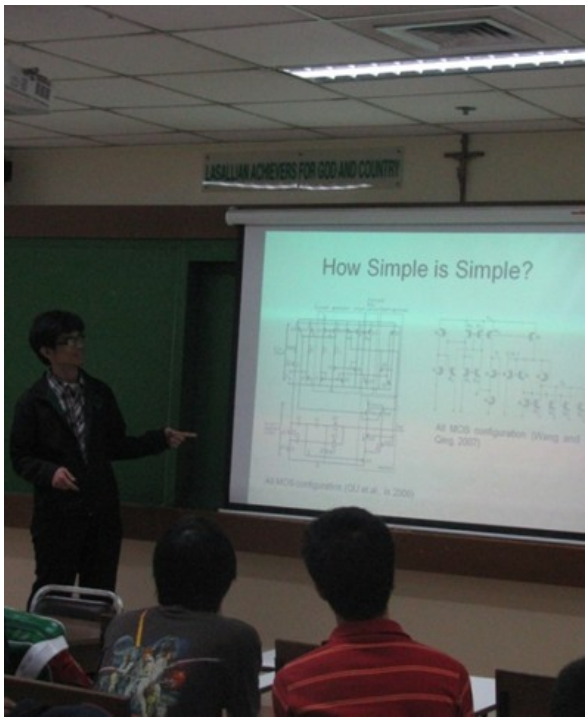
How Simple is Simple?

Industrial Engineering Department

The DLSU Industrial Engineering in the Philippines produces well rounded graduates who are holistic, program oriented problem solvers and critical thinkers with the ability to integrate theory and practice towards more effective sustainable systems.

The Industrial Engineering department has the following research centers/laboratories:

Center for Lean Systems Management (CLSM) – This research center intends to provide SMEs pertinent and applicable information on production and operations management to improve their manufacturing and operations capability. A major part of the program of CLSM is to gather best practices on service and manufacturing excellence from various SME organizations and allow SMEs to benchmark their operations against these best practices. CLSM also aims to study the various tools, techniques, and strategies of SMEs and spearhead the development of programs that will make entrepreneurs more aware and knowledgeable of their own systems. Researches in inventory and quality management are tackled through this center.

Center for OR/MS (CORMS) - This research center envisions to partner with Government and Industry in pursuing applied and theoretical research in the field of Operations Research and Management Science as a tool for quantitative decision-making towards making the Philippines a globally competitive country. Typical research problems in the area of logistics/ distribution (supply chain management), facility location and layouting, scheduling, traffic management, sustainability and environment management, among others are tackled through this center.

Human Factors Engineering Center (HFEC) – This center envisions to become a leading human factors research facility in the Philippines and in Southeast Asia. Anthropometry, biomechanics, safety and health, ergonomics in design, human computer interaction and affective product design are among the researches pursued by students in this center.

The Graduate program is divided into the following tracks:

- Operations Research/Management Science
  Facility location and layout, scheduling, traffic management, inventory management, project management, financial and investment models, supply chain models involving product or service distribution, forward and reverse logistics, supplier and facility selection, etc.
- Manufacturing and Service System Design, Management and Assessment
  Lean manufacturing, six-sigma, performance measurement and analysis, productivity and quality management, etc.
- Human Factors Engineering
  Anthropometry, biomechanics, safety and health, ergonomics in design, human computer interaction and affective product design, etc.
- Environment and Sustainability
  Cleaner production systems, product-service systems (PSS), triple bottom-line measurement approaches, etc.

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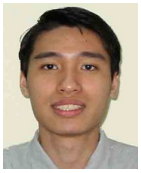

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Facilities

Ergonomics and Product Development Lab (ST218)

The Ergonomics and Product Development laboratory is a research and instructional facility that is geared towards researches on usability testing, human computer interaction, anthropometry, biomechanics, application of ergonomic principles in product design, occupational safety and health, workload/workflow analysis, shiftwork analysis, postural analysis and affective product design. Products ranging from school bags, shoes, cell phones, hospital beds, drafting tables, walker for the elderly, swim exerciser, etc. are designed using available equipment and software in the lab and prototypes are likewise developed. Eye tracking solutions for website information design and placement as well as item locations in supermarket shelves are among the eye tracking researches done in the lab.

Operations Research and Simulations Lab (V505)

The Operations Research and Simulations laboratory is a research and instructional facility for mathematical and simulation modelling. It contains efficient computing software and equipment that enables researchers to model real world problems and optimize them. Researches include distribution systems modelling, sales force allocation and scheduling, forward and reverse logistics, multi-attribute total quality management model, location modelling for lean facilities, call center operations and manpower scheduling, robust water reuse using fuzzy LP, etc.

Research Laboratory for MS/PhD (ST223)

The Research Laboratory for MS/PhD provides individual research work spaces for MS and PhD students pursuing research work on Modeling and Optimization. This lab provides the same facilities as the Operations Research and Simulations lab except that it has the most advanced software available for high performance computing in solving real world problems that involve millions of variables and constraints.

Industrial Engineering

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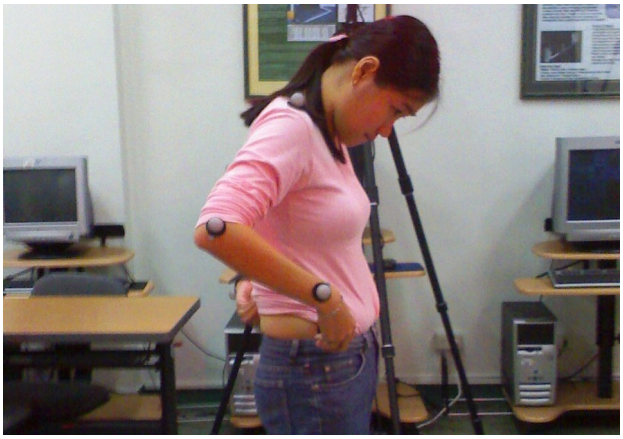

Mechanical Engineering Department

The Mechanical Engineering (MEE) program prepares students to meet the challenges and demands of practicing mechanical engineers in today's world. On top of the traditional areas of mechanical design, heat and power engineering, new and renewable energy, environmental technology, thermo- fluid engineering, fuel and combustion technologies, engineering materials, industrial and product safety, and engineering management, its concentration in automation, mechatronics and robotics makes it the most innovative in the country. Its multi-disciplinary nature allows the students to take subjects in electronics, computer, and control systems engineering.

Courses in MEE include engineering materials, computational fluid dynamics (CFD), CAD/CAM/CAE, finite element analysis, mechatronics, kinematics, machine design, heat transfer and thermal dynamics, refrigeration and air-conditioning systems, aerodynamics, new and renewable energy, industrial and product safety, environmental engineering, and energy management.

ME faculty and students are officers and active members of the Philippine Society of Mechanical Engineers, Philippine Society of Ventilating, Air-conditioning, and Refrigerating Engineers, American Society of Mechanical Engineers, American Society of Heating, Refrigerating and Air-conditioning Engineers, and National Research Council of the Philippines. A number of MEE faculty have received awards from the National Academy of Science and Technology (NAST)

The Graduate program is divided into the following specializations:

- Energy and Environmental Systems
- Thermo-Fluid Engineering
- Machine Design
- Mechatronics

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Facilities

Laboratories under the Mechanical Engineering Department:

- Power and Thermodynamics Laboratory
- Heating Ventilation and Air Conditioning (HVAC) Laboratory
- Mechatronics Laboratory
- Micro-hydro Research Laboratory
- Materials Testing Laboratory
- Computer Aided and Design Laboratory
- Machine shop and foundry Laboratory

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Mechanical Engineering

De La Salle University

Manufacturing Engineering and Management Department

The MS-MFG Program aims to enhance the ability of graduates to increase the performance and profitability of manufacturing companies through the use of modern automated systems and management.

Research Interest

The Master of Science in Manufacturing Engineering (MS MFG) degree is designed for the professional development of engineers, particularly those whose wish is to carve a career in research and development in the field of manufacturing engineering. The program requires mastery of a field of specialization through course work and master's thesis.

The Manufacturing Engineering & Management has the following research laboratories:

- CAD/CAM Laboratory
- CNC/CIM Laboratory
- Robotics & Mechatronics Laboratory
- CATIA V5 Laboratory
- Biomedical Instrumentations & Medical Informatics Laboratory
- Intelligent System Laboratory

Academic Resources

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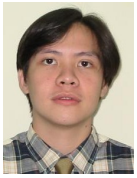

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Facilities

CAD/CAM Laboratory:
20 Computers / Software: GibbsCAM, CATIA V5, AutoCAD, MATLAB 7.0.1, Microsoft Visual Studio, Kail Uvision, Solid Edge ST2

CNC/CIM Laboratory:
DYNA MYTE CNC, DENFORD CNC Milling, Mitutoyo CMM, MICROMILL, Ind'l Plastic Center, Blow Molding Module, Bungard CCD, Comlab 3, CIM (Mfg Workstation)

Biomechatronics Laboratory
15 Computers / Software: GibbsCAM, CATIA V5, AutoCAD, MATLAB 7.0.1, Microsoft Visual Studio, Kail Uvision, Solid Edge ST2

Robotics & Mechatronics Laboratory:
Material Engineering Testing, Pneumatics

CATIA V5 Laboratory:
30 Computers / Software: GibbsCAM, CATIA V5, AutoCAD, MATLAB 7.0.1, Microsoft Visual Studio, Kail Uvision, Solid Edge ST2, Catalyst Control Center, Protel 99 SE trial, ANSUR

Biomedical Instrumentations & Medical Informatics Laboratory:
Microscope, BIOPAC, ANSUR Medical Device Electrical Tester, Measuring Devices, 11 Computers / Software: GibbsCAM, CATIA V5, AutoCAD, MATLAB 7.0.1, Microsoft Visual Studio, Kail Uvision, Solid Edge ST2, Catalyst Control Center, Protel 99 SE trial, ANSUR

Intelligent System Laboratory:
Soccer Robot, Computers

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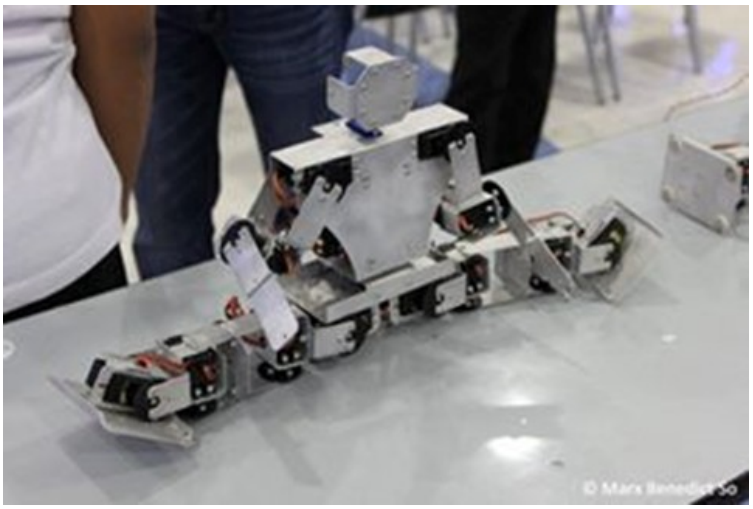
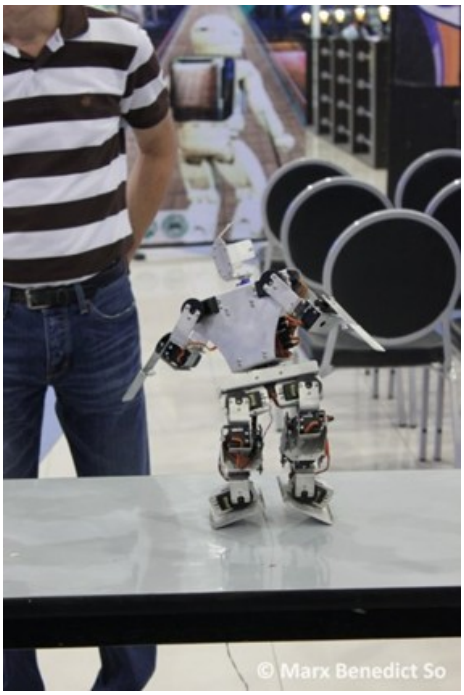
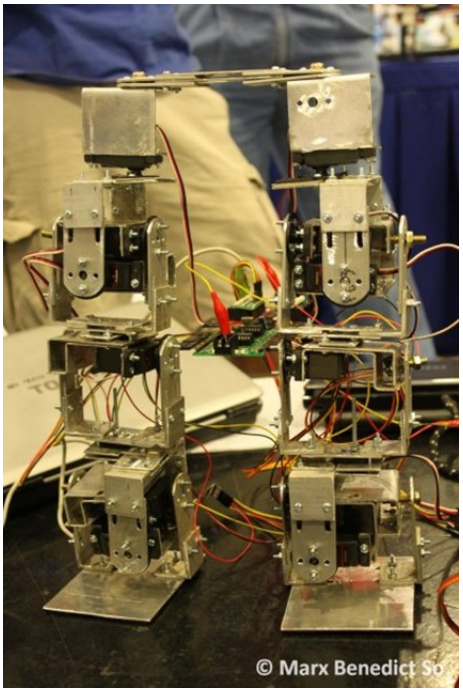
Index for industry sector

CAE/CAD/CAM/CIM Systems
Concurrent Engineering & Integrated Information Systems
Instrumentation & Control Technology
Computer Applications
Artificial Intelligence
Evolutionary Systems
Fuzzy Logic, Genetic Algorithm, Neural Networks
Applied Robotics
Robotics & Automation
Machine Design & Kinematics
Computer software development and packages
Computers and electronic embedded systems
Controls, control systems and regulators
Advanced Material Processing
Manufacturing Processes & Practices








Feature
Photographs by Ikie Binoya and Luis De Vera
THEIR SCIENCE PROJECT, SORT OF
EMG Based Robot Arm Controller
As featured in the Sunday Inquirer Magazine (6 June 2010)
Think "Daimos" or "Ironman": The robotic arm


Marx Benedict So © 05-2010


TRIAC VMC

College of Computer Studies

The College of Computer Studies (CCS) is committed to its three-pronged vision of continually sharing knowledge and expertise through teaching, engaging in Computer Science research and Information Technology product development, and rendering service to communities in need.

CCS upholds the tradition of excellence embodied by the Lasallian education. Through its intensive undergraduate programs that emphasize actual implementation of theories and of project-oriented and real world environment, the College develops experts in computer science, computer engineering, and information technology, equipping its students to become tomorrow's leaders in industry, academe, and government.

Vision

We are a community of scholars imbued with Christian values who have the passion to contribute to national development and social well-being. We are committed to creating and sharing knowledge in Computer Science and ICT as the premiere educational institution in Southeast Asia, recognized globally as the Philippine benchmark for quality education and research.

Mission

We nurture the academic community in a culture that develops the total person. We hone leaders in technical, professional and entrepreneurial domains and train them to adapt to fast-changing technologies and environments. We take the lead in the innovation of new technologies and their applications through cutting-edge research and state-of-the-art learning infrastructure. We pursue opportunities for immersion, consulting, and technology commercialization, working closely with our partners in industry, government, and academe.
We inspire each one to fervently work for the common good, and help those in need, especially the poor and the marginalized.

Graduate Degree Programs

The Master of Science in Computer Science (MSCS) degree program was established to develop in its students the skills in conducting research and further studies at the doctoral level by training them to undertake high level research in Computer Science. It provides students with theoretical and underlying principles of computation on various areas of computer science. The students' understanding of these, and their proficiency and style in written as well as oral communication, are primarily attested to by the successful completion and defense of a master's thesis.

The MSCS program aims to develop in its students:

- A working foundation to undertake high level research in Computer Science;
- The basic skills in research of various theories and underlying principles of computation;
- The ability to analyze theoretical solutions; and
- The skills necessary to use abstract models in studying computer and software systems.

The Doctor of Philosophy in Computer Science is designed to develop scientists capable of conducting independent research in Computer Science. Courses are organized depending on the research interest of each student so as to provide him with a deeper knowledge of Computer Science as well as ample preparation for scientific research in his chosen field of specialization. As part of a sandwich program, a PhD candidate is encouraged to spend three (3) to twelve (12) months of dissertation research at a host university in a foreign country to provide him with opportunities to discuss research works with international experts.

Research Centers

The Graduate Programs are supported by Research Centers working on the following areas:

- Empathic Computing

Affect recognition and synthesis in various modalities – face, voice, gesture, laughter, gait, music, text, brainwave signals – to provide support in an empathic space

- Language Technologies

Language modelling, tools and resources; Corpus linguistics, Text analysis, Sentiment analysis, Opinion mining and classification, Information extraction, Text generation, Story generation, Summarization, Dialogue systems, Machine translation

- Automation Control

Automation of electro-mechanical systems, Image processing, Speech processing, Autonomous vehicles

- Network and Information Security

Sensor networks, Ethical hacking

- TE3D (Technology, Education, Empathy, Entertainment Design)

Multi-disciplinary research involving ergonomics, empathic computing, human-computer interfaces, language technologies, ubiquitous computing, embodied agents, computer vision, sensor networks, and learning systems.

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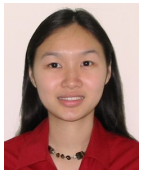

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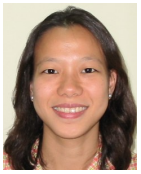

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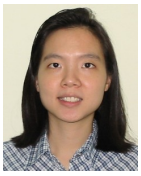

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Facilities

Center for Empathic Human-Computer Interaction (CEHCI)
The Center for Empathic Human-Computer Interactions focus on developing technologies that (a) build human affect models in multimodal environments, and (b) provide appropriate empathic responses to computing systems. The term computing systems is extended to mean not only interactions between it and a human user (via a software, for instance) but also (possibly) via sensor-rich, ambient intelligent, ubiquitous physical spaces. This area of research is called empathic computing. It combines various disciplines of signal processing, statistical modeling, machine learning, sensor-rich and ubiquitous computing, including ambient intelligence.

Currently, the Center is located at G402 of the Gokongwei Building. Half of the room is designated as an experimental living space, while the other half serves as workspace for its students and researchers.

The living space is composed of a user's work and leisure (de-stress) areas. A user does his work using computers, holds meetings with colleagues, and so on. A sofa, cable tv, Nintendo Wii, Ipod dock, coffee maker and water dispenser is found in the leisure area. When the user is tired, or wants to relax, he proceeds to this area.

The workspace serves seven (7) PhDCS students, six (6) of whom are full-time faculty members of the College of Computer Studies, and one (1) full-time Department of Science and Technology (DOST) scholar, four (4) MSCS, and eight (8) undergraduate students. These students do various research-related activities at the laboratory.

Funds for the operation of the research center is acquired from various sources. The University, through the funds of the College of Computer Studies, shouldered renovation, furniture and appliance expenses. The DOST's Philippine Council for Advanced Science and Technology Research and Development approved a three (3)-year project. This fund was used to purchase scientific and experiment equipment such as sensors, microphones, video cameras, web cameras, headsets, workstations and laptops for use of the researchers.

Center for Language Technologies (CELT)
The DLSU-NLP research lab is currently the premiere center for Human Language Technology development and research in the country. Composed of a team of seven (7) full-time faculty members, as well as graduate and undergraduate students from the College of Computer

Studies, the lab conducts various research projects in the field of computational linguistics through development of prototypes on language technology tools and linguistic resources that can later be incubated to become commercial-grade products. These activities are in collaboration with various language experts from all over the world.

Since its inception in 2002, the lab has established the network of NLP researchers and their respective researches from all over the country through the training and formal education of faculty members of Universities from various parts of the country. NLP courses both at the graduate and undergraduate levels have been offered to constantly train experts in this area of research. It also continuously strengthens this network through the hosting of annual national symposia, where both local and foreign researchers have been invited as speakers. In 2008, aside from organizing the 5th national NLP research symposium, the NLP research lab hosted the 22nd Pacific Asia Conference on Language, Information and Computation, which is an annual meeting of international scholars in the Asia Pacific region in theoretical and computational linguistics to share new ideas about language, information and computation.

Over the years, various projects have been developed by the team including a multi-engine bi-directional English-Filipino machine translation system, an automatic text summarizer, Filipino part-of-speech taggers and morphological analyzers, story and humor generator systems, multiple choice question generation system, natural language query processors and report generators, and automatic building of lexicon.

Currently, the Center has a CHED-funded project for building a practical network-based service on ASEAN languages text translation in the tourism domain, as part of the ASEAN network-based machine translation public service project.

Center for Automation Research (CAR)

The Computer Technology Department, College of Computer Studies of De La Salle University specializes in research and development of computer-based systems oriented to systems automation. The department was established in the mid-80's and in 1988 produced devices and systems such as computer-controlled robot arms, a speaker-dependent, 30-vocabulary speech recognition system, and a standalone 8088 microprocessor trainer kit. The 25 years since has seen the department continuously develop its expertise, delving into a wide array of areas such as digital signal processing, embedded systems, cooperative mobile robotics, image processing, computer architecture simulation, computer communications, computer management of gasoline and diesel engines. We have developed land, sea and air robots, computer programs that recognize people, objects and handwriting, as well as human limb extenders that are remotely controlled and provide tactile feedback or can be activated by the minute electrical signals from a person's muscles.

The Center for Automation Research was established in 2011, and provides a laboratory and computing facilities for the development of solutions that combine sensor technology, interfacing, and computing power. Presently, the Center's efforts are in three areas relevant to national development: The Adarna project aims to engineer a semi-autonomous helicopter for aerial surveying, to be used for risk assessment, reduction and management, as well as post-disaster response coordination. In the area of agriculture, the Center looks at sensor-fusion approaches to improve the growth of certain plants with cancer-fighting properties. And for public health, the Center uses signal processing to develop an electronic stethoscope to help identify pulmonary pathologies.

Mobile and Netcentric Computing Laboratory

The network centric laboratory serves as a venue for research on web and mobile technologies focusing on ubiquitous computing and the semantic web. Currently the lab has a memorandum of understanding with Globe Philippines to develop an incubation center and at the same time has a soft agreement to collaborate with Google to develop a curriculum for their OpenSocial Platform in collaboration with other Universities including Ateneo, UP Diliman, and De La Salle College of Saint Benilde.

In the past five years or so, the lab has been participating in the Microsoft Imagine Cup that is an international competition to innovate using Microsoft Technologies. In 2008, the lab has also participated and won in competitions conducted by Globe Labs Philippines that aims to spur innovation in the use of mobile technologies.

In 2009, the lab undertook expansion plans in terms of its memberships from both the student and faculty population. At the same time, the lab aims to increase its publications to international conferences and journals while making sure that research is grounded to industry demand through venues such as the Globe partnership. Infrastructure requirements for online collaborative work will be put in place within the year.

The laboratory has acquired new hardware consisting of 30 quad-core workstations, 2 quad-core servers, and 4 iMacs for iPhone related application development to be placed in G301 which also includes 2 Wi-Fi enabled projectors and a smart board. This is on top of the 20 HP iPaqs donated by HP and 4 Dopods (owned by Microsoft Innovation Center) that are currently available for development use. Additional resources on both hardware and software are also being planned and scheduled for the incoming school year to increase the capacity and capability of the lab.

Center for Network and Information Security

CISCO

The Center for Networking and Information Security (CNIS) is used as a venue for research projects that is focused on computer networks and information security. It houses several networking equipment such as hubs, switches, and routers that are used in implementing different types of network topology. Such activity helps in understanding concepts on collision and broadcast domains, subnetting, static and dynamic routing, virtual local area network (VLAN), and wide-area network technologies.

The said equipment are placed in a network rack for easy access and a more organized set-up.

The laboratory also utilizes virtualization software in order to conduct experiments related to information security, specifically on ethical hacking. The laboratory has a host server that houses virtual machines with different operating systems and applications in order to study and verify the existence of vulnerabilities as well as test possible countermeasures.

Twenty-two (22) workstations are provided as possible end nodes when implementing network topologies. The specification of the computers is sufficient to house approximately four virtual machines in each end node. This allows the laboratory to produce approximately 110 end nodes (both physical and virtual) that can be used for experiments.

The laboratory provides both wired and wireless connection. Each workstation has a provision of four (4) network ports. The tables housing the workstations are customized in order to allow easy access to the said ports. This minimizes the set-up time when transitioning from the implementation of one network topology to another. Each table is also equipped with dedicated power strips to allow connection of additional nodes (e.g. laptops and wireless routers).

A server table is also provided that can accommodate approximately 15 servers. Some of the servers are used for operational and instructional purposes while others are specialized servers are used for specific researches on network convergence, information security, and network management.

The laboratory has two different Internet gateways. The first Internet connection follows the university policy in terms of Internet utilization such as regulated website visits and network services (e.g. traceroute capabilities are blocked). The other Internet connection is free from the said limitation. This is typically used for experiments which require unregulated Internet access.

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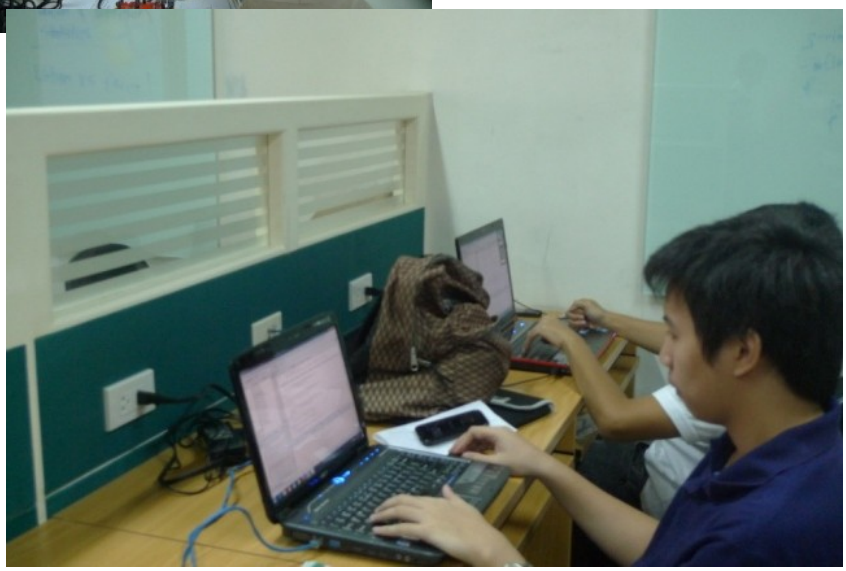

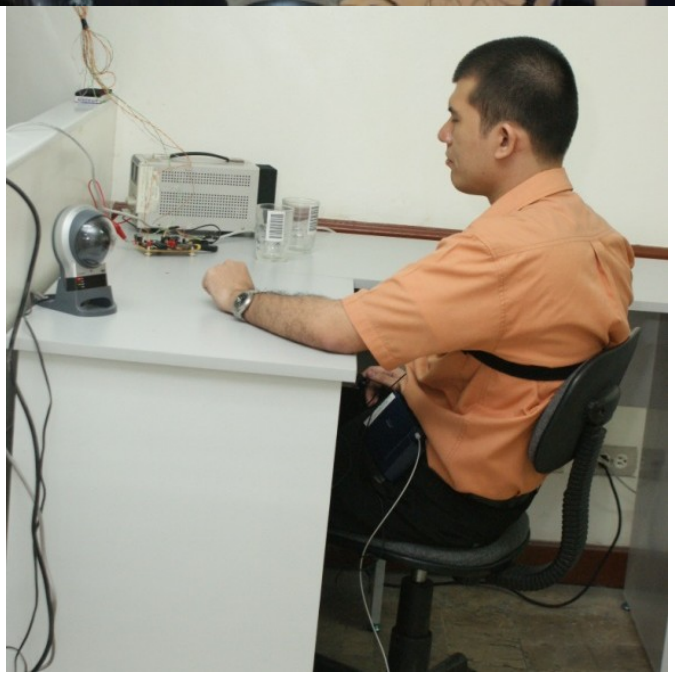

Computer Studies

Ceramics, Metallurgical and Mining Engineering Department

An alternative institution to UP Diliman for teaching and higher learning in the field of ceramics, metallurgical and material science engineering located in Mindanao. Research embraces the respective specialization of the faculty members

Pyrometallurgy Laboratory – engaged in the low cost mineral processing for the development of mineral resources such as alternative technology for processing of chromite and laterite ores: Fe-NI-Cr-V alloy production.

Ceramics Engineering Laboratory – engaged in a wide range of activities in ceramics innovations and value-added ceramic products from conception to production, evaluation, application and finally to sale; Specific areas cover Porous Ceramics Fabrication, Ceramic Diffuser/Ceramic Water Filter Design, Electrophoretic Deposition of Ceramic Materials and Nano/ Ceramics/Polymer Composites.

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Facilities

Pyrometallurgy Metallurgy – Facilities include High Temperature Elevator Furnace, High Temperature Vertical Tube Furnace, CO/CO2 Gas Analyzer, Gas Mass Flow Controllers, Electroanalyzer apparatus, Metallurgical microscope, and polisher/grinder.

Ceramics Laboratory – Facilites include Laser Particle Size Analyzer, Universal Testing Machine, Oxidation/Reduction Furnaces, Poroscope for Visual Imaging, Laboratory Microwave Ovens and various others

Mineral Processing Laboratory – Facilities include Bond Mill, FIlotation Machine, Bomb Calorimeter, Fusion Cupellation Furnace, Metallurgical Microscopes, Roller Mills, Mechanical Rotary Shakers

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Hammer “maso” used in crushing ores

VERSA LOADER MACHINE
for breaking strength test(modulus of rupture)

RESISTANCE TEMPERATURE DETECTOR (RTD) MICROWAVE OVEN
for slip casting and starch consolidation process

Civil Engineering Department

A leading engineering institution in Mindanao offering graduate civil engineering programs to provide more globally competitive civil engineers and to promote researches for sustainable economy and safe environment

Research Interest

The Civil Engineering Program is divided into 5 specialized fields: Structural and Construction, Geotechnical, Water Resources, Transportation, and Environmental Engineering. However, the MSCE program we offer is a combination of courses taken from the different fields, particularly Structural and Construction, Water Resources and Geotechnical Engineering.

- Climate change effect particularly Flood monitoring, forecasting, Hazard assessment and mapping (GIS), mitigation, and preparedness
- Developing innovative construction materials from local sources or from waste materials
- Software Development in Structural Analysis and Design
- Water Supply Assessment, Distribution and Management

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Facilities

Materials Testing Laboratory

The MTL provides testing of the strength and physical properties of the material particularly concrete, steel and wood used in construction. It include a Universal Testing Machine (UTM) and A-frame for big sample testing

Soil Mechanics Laboratory

The Soil Mechanics Laboratory is used to determine the properties and strength of soil, asphalt and concrete aggregates., particularly in selecting aggregates and soil foundation testing. It include CBR test machine, consolidometer, sand-cone apparatus, triaxial apparatus, Vicat apparatus, sieves, and oven.

Fluid Mechanics and Hydraulics Engineering Laboratory

It is intended for water and other fluids testing and experimentation. It is being managed by the Mechanical Engineering Department.

Electrical, Electronics and Communications and Computer Engineering Department

A leading institution of higher learning renowned for its excellence in the field of electrical and electronics engineering and for its commitment to the holistic development of the individual and society with its diverse cultures through relevant programs in instruction, research, extension, and community involvement.

The Graduate program is divided into the following tracks:

Microelectronics

Analog, digital and mixed signal electronics ADC-DAC, Radio frequency (RF) IC design; microprocessor development and design; low power electronics (buck-boost) and semiconductor device research;

Power and Energy

Electric power system optimization, economic operation, dynamics and control, protection and reliability evaluation; electrical transients and power quality; electricity markets; design, analysis, modeling, and control of electrical machines, converters, electric drive systems; smart grids; new and renewable energy systems including wind, mini-hydro, fuel cell, and solar energy systems.

Graduate and undergraduate students are assigned to research groups and laboratories, which cater to diverse interests and specializations. The six(6) research laboratories of the MSU-IIT are as follows:

- Electric Power Research Laboratory
- Microelectronics Laboratory
- Mobile Robotics Laboratory
- Power Electronics Laboratory
- Power Systems Simulation Laboratory
- Robotics and Automation Laboratory

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Facilities

I. Microelectronics Laboratory is equipped with an industry standard IC design Synopsys tools. These design software suites include tools for the design, layout and verification of integrated circuits. Also, can cater platform for both cell-based and full-custom content speeds complex chip design and integration tasks which can keep up with the challenges and demands of today's nanometer technology.

The laboratory has three (3) research units/groups:

Power IC Group

- Full-Custom design, simulation and layout of power converters for portable applications such as DC-DC converters and LED drivers.
- Analysis, design and chip layout for energy converter IC, such as RF-to-DC and indoor light energy harvester using photovoltaic cells.
- Design and analysis of power management IC for portable devices and smart phones.

Mixed Signal Group

- Design, development, and integration of analog and digital signals. Full-custom and integration of analog & digital tools platform for AD/DA converters.
- Full-custom design and layout of the different architectures of ADC/DAC for video and audio application, particularly 18bit delta-sigma architecture.
- Successfully fabricated and tested the 8bit current-steering architecture DAC IC for the national project funded by the Philippine government for the national pilot project entitled," Eye-C Vision Capable IC for Mobile Robot Explorer.

Digital Signal Group

- Design and prototyping of various system design using FPGA board such as advance Altera and Xilinx development board. The designed prototypes cater a vast applications in disaster management and mitigation, surveillance security, advance communications, controls and system management.
- ASIC implementation of digital design mentioned in (1).
- ASIC design, development and enhancement of various existing IPs, such as Ethernet 10/100 IP, USB 3.0 controller, CCIR656 video controller, and floating point unit (FPU).

II. **Electronics Communication Laboratory** is equipped with specialized and high-end development board and test equipment and facilities, such as NI Elvis II, Emona Datex and Emona Fotex.

III. **Electric Power Research Laboratory** - The laboratory provides facilities for research work in the areas of modern power grid operation, protection and condition monitoring. It is equipped with measuring and testing instruments that gears toward safety, reliable and optimum generation, distribution, conversion, measurement and control of electric energy. The laboratory has active research collaboration with electrical power industry in Mindanao, that focus their collaborative research in developing facilities for energy storage systems to built up energy storage for future smart energy distribution and vehicle-to-grid infrastructure.

IV. **Power Electronics Laboratory** - The laboratory is known for its high quality research contributions in power system analysis, power system reliability, power quality, power electronic converters, control of motor drives, and silicon carbide based power electronic systems.

V. **Mobile Robotics Laboratory** - The Mobile Robotics Laboratory is a research laboratory under the Mechanical Engineering and EECE laboratory. The main area of research of the laboratory is on. The main research are the development of theoretical and technological solutions in particular on the area of autonomous systems, one of the most important practical subjects on the use of mobile robots as intelligence agents in improving mankind's quality of life.

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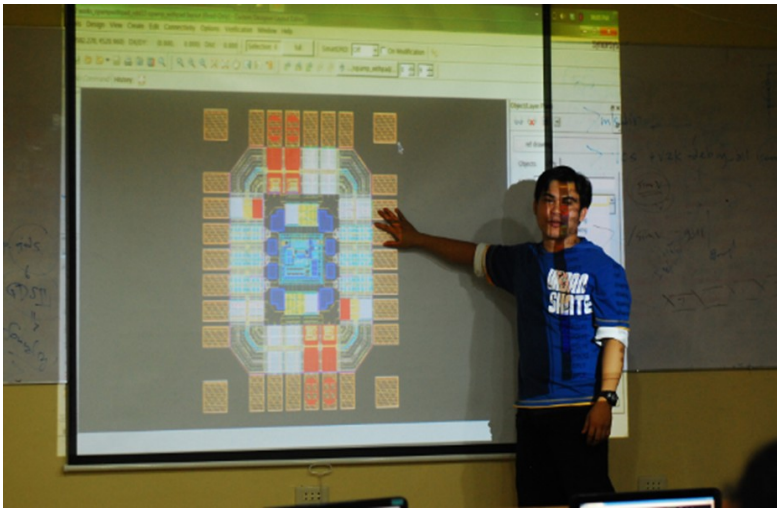
Extension Program
WELCOME Attendees
Series Re-echo Training/ Workshop
SYNOPSYS Full-Custom IC Design
CD/VCS/DC Tools
2nd flr, Microelectronics Lab, College Of Engineering, MSU-IIT
May 7-8, 14-15, 21-22, 27-29, 2011



Mechanical Engineering Department

The department is a premier institution for teaching and research in the field of mechanical engineering. Research and instruction in the department have a wide range of interest leading to interdisciplinary collaborative activities for technological advancement by applications of knowledge in heat & mass transfer, fluide machineries, mechanics of solids, solar thermal energy, aerospace engineering and environmental engineering.

Research Interest

The Research Interests in the department are:

- Aerospace/ Aeronautics Engineering
  Applied Aerodynamics, Underwater and Aerial Robotics, Biomimetics and Unconventional Propulsions
- Combustion and Fuels Engineering
  Combustion and gasification of agricultural wastes, Fluidized-bed Combustion
- Fluid Machineries
  Gas Turbines, Wind Turbines, Micro and Mini Hydro, Pumps, Compressors and Fans
- Heat and Mass Transfer
  Two-phase flow, Thermal Properties of Materials
- Solar Thermal Energy
  Solar Ponds, Solar Panels, Photo-Voltaic Cells, Solar Thermal Energy, Renewable Energy

Graduate and undergraduate students are assigned to research groups and laboratories, which cater to diverse interests and specializations. The five (5) research laboratories of the department are:

- Computing Laboratory
- Robotics, Instrumentation & Control Engineering (RICE) Laboratory
- Fluid Machineries Laboratory
- Combustion and Fuels Laboratory
- Solar Thermal Laboratory

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Facilities

Bomb Calorimeter for Calorific Value Determination

There are three Oxygen Bomb Calorimeters by Parr Instruments that are in the department. Coal mining firms all over Mindanao have come to MSU-IIT for determination of the Calorific Value of their coal.

Dead Weight Tester

The department has a Dead Weight Tester used to calibrate pressure gages and pressure transducers. The Tester had been used extensively to calibrate pressure sensitive instruments used in the researches conducted in the department.

Subsonic Wind Tunnel

The Subsonic Wind Tunnel is used in airfoil, vanes of wind turbines, fans and blowers.researches.

Robotics, Instrumentation & Control Engineering (RICE) Laboratory

The RICE laboratory is an interdisciplinary research and instructional facility at the 'College of Engineering of the MSU-IIT. The laboratory involves the design of unmanned terrain, aerial and underwater robotic vehicles, aerospace vehicle and propulsion design, applied aerodynamics in the performance enhancement of power generating systems, and experimental and computer-aided engineering analyses, designs and controls of structural and mechanical systems.

Current Research Thrusts:

1. Development of rotary-wing, fixed-wing and flappiong-wing unmanned aerial vehicles for aerial surveillance,
   reconnaissance and photography, and for fast monitoring and assessment of agricultural and natural disasters.
2. Development of bio-mimicked underwater robotic vehicle for marine ecological assessment and preservation.

3. Development of high-lift wing-in-ground effect vehicle for rapid and high volume inter-island transportation.
4. Performance enhancement of wind and hydraulic turbines.
5. Improvement of workplace health and safety by engineering and ergonomic interventions.

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CNC Machining

The department has a CHEVALIER CNC 3-Axis Machining Center and a CNC Lathe Machine for fabrication of precision parts used in research.

Computing Laboratory

The Computing Laboratory is used by the undergraduate and graduate students to simulate mechanical engineering designs and processes. The Laboratory is equipped with descomputers and SOLIDWORKS software.

Solar PVC and Solar Thermal Instruments

The department has Solar Pyranometer and Solar Panels to support researches in renewable energy. The department also supports the multi-disciplinary graduate course in Sustainable Development Studies.

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COLLEGE OF ENGINEERING AND AGRO-INDUSTRIAL TECHNOLOGY

Traces its roots to the former Department of Agricultural Engineering created in 1912 as one of the departments of the UP College of Agriculture. In 1976, the Department of Agricultural Engineering was elevated to the Institute of Agricultural Engineering and Technology (INSAET).

On February 24, 1983, CEAT was finally established upon the approval of the UP Board of Regents in its 958th meeting.

CEAT has become one of the best engineering colleges producing quality graduates and continuing to develop and generate engineering technologies and knowledge products in service of the Filipino people since its institution.

Vision

Excellence in engineering education, research and extension; committed to progressive transformation and global relevance of Philippine Agriculture and Industry.

Mission

To produce engineers with the highest technical capabilities, entrepreneurial and networking skills, commitment to the protection of the environment and natural resources, deep sense of ethical principles, desire to serve the nation, and appreciation of our culture and arts.

University of the Philippines Los Baños

University of the Philippines Los Baños

Institute and Departments

Institute of Agricultural Engineering
Department of Chemical Engineering
Department of Civil Engineering
Department of Electrical Engineering
Department of Industrial Engineering
Department of Engineering Science
Energy Engineering Program
Environmental Engineering Program

Graduate Degree Programs

- Master of Science in Agricultural Engineering
- Master of Science in Agrometeorology
- Master of Science in Chemical Engineering
- Doctor of Philosophy in Agricultural Engineering

Highlight

The University of the Philippines Los Baños, with its national and regional mandates for excellence in engineering education, its commitment to rural agro-industrial development and its proven strengths in graduate and undergraduate instruction and research, is in a unique position to complement the crop of graduates of other institutions for the agro-industrial development needs of the country.

The College pursues research collaborations with government and non-government organizations, the private sector, and international organizations towards the development of the country's engineering sector. CEAT also implements extension projects for the benefit of engineering stakeholders, particularly the farmers.

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University of the Philippines Los Baños

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Department of Chemical Engineering

University of the Philippines Los Baños

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COLLEGE OF ENGINEERING

The USC College of Engineering is the premier and leading engineering school in the Visayas and Mindanao region. Established in 1939, the College continues to be the biggest engineering school in southern Philippines with a current student population of 3,325. Determined to constantly serve the needs of a growing industry, it keeps widening its undergraduate and graduate degree programs. Over the years, the College has established a reputation of producing graduates who become distinguished leaders in the industry, government, the academe, and other sectors. Strong curriculum and research are well integrated into the different academic programs through a pool of dynamic and dedicated faculty members.

The College of Engineering considers research as an integral part of the students' curriculum. Faculty members and students actively engage in research projects. Collaborative projects between the academe and the industry are also carried out by the different departments. The College has established linkages with various national and international research and academic institutions. Integrating quality instruction and research in all aspects of the engineering curriculum remains the commitment of the College.

The College's vision is closely tied to that of the University. It seeks to develop technically-competent, globally-competitive engineers who are socially-responsible and life-long learners. The college aims to provide relevant academic programs responsive to the needs of the local, national, and global communities.

Departments, Institutes and Programs

Department of Civil Engineering
Department of Chemical Engineering
Department of Computer Engineering
Department of Electrical and Electronics Engineering
Department of Industrial Engineering
Department of Mechanical Engineering

Undergraduate Degree Programs

- Bachelor of Science in Civil Engineering
- Bachelor of Science in Chemical Engineering
- Bachelor of Science in Computer Engineering
- Bachelor of Science in Electrical Engineering
- Bachelor of Science in Electronics and Communications Engineering
- Bachelor of Science in Industrial Engineering
- Bachelor of Science in Mechanical Engineering

Graduate Degree Programs

- Master of Science in Chemical Engineering
- Master of Engineering in Chemical Engineering (non-thesis)
- Master of Engineering in Civil Engineering
- Master of Science in Civil Engineering
    - Water Resources and Environment
    - Structural and Geotechnical
- Master of Engineering in Computer Engineering
    - Computer Option
    - Digital Systems Design Option
    - Software Engineering Option
- Master of Engineering in Electrical Engineering
    - Control Systems Option
    - Energy Management Option
- Master of Engineering in Electronics and Communications Engineering
    - Computer and Communications Option
    - Control Systems Option
    - Microelectronics Option
- Master of Engineering in Industrial Engineering
- Master of Engineering in Mechanical Engineering

Highlight

The USC College of Engineering is the lone Philippine university member of the School on the Internet-Asia (SOI-Asia), a consortium of 15 universities situated in 11 countries across Asia. It can be noted that the Philippines was first connected to the Internet at the 1st International Email conference held at USC in March 1994.

USC is a Center of Development in Chemical Engineering, Civil Engineering, Electrical Engineering, Electronics & Communications Engineering, Computer Engineering, Mechanical Engineering, the only engineering school recognized in Central Visayas. Thus, USC is among the universities nationwide with the most centers of excellence and centers of development recognized by CHED.

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ERDT Project Leader

University of San Carlos

Department of Chemical Engineering

The USC-ChE Department is a recognized center of development that provides quality education and leads in researches on bioprocess engineering.

Research Interest

The BioProcess Engineering and Research Center (BioPERC) serves as the research arm of the USC-ChE Department. It has for its research agenda three interrelated areas: [1] bioconversion, the science and engineering of fermentation and enzymatic processes for the conversion of bio-based feedstock to high-value compounds, [2] bioseparation, the downstream processing of fermentation products and separation techniques for compounds of biological or agricultural origin, and [3] biotreatment, the science and engineering of waste treatment by biological means. One of the current and large projects of BioPERC is the integrated mango waste treatment and recovery of high-value products. This and other projects are carried out in the laboratories of the department with state-of-the-art equipment.

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Facilities

The Chemical Engineering Research Laboratories are located on the second level of the department building, the laboratory is sectioned into four interacting areas:

Analytical Room
An air-conditioned room that houses the following analytical equipment and instruments: Total Organic Carbon Analyzer, Gas Chromatography Systems, HPLC System, FPLC System, UV-

VIS Spectrophotometer, Dissolved Oxygen (DO) Meters, Conductivity Meters, Turbidity Meter, Spectrophotometer, Analytical balances, Micro-rotary evaporator, Sample homogenizer, Vortex mixers, Ultrasonic bath, Magnetic stirro-heaters, Milli-Q Water Purification System, and Storage Refrigerator

Fermentation and Microbiology Room
Installed in this air-conditioned room are the two 3-liter Bioreactor Systems equipped with a biocontroller that allows on-line measurements of pH, temperature, DO, and acid-base flow rates. The room is equipped with laminar flow cabinet to create a particle-free working environment and a UV decontamination system. Also found in this area is the vacuum freeze dryer and the sterilization autoclave.

Student Research Room
This room is designed for students doing their research projects. The place is equipped with basic laboratory instruments and apparatuses needed for simple testing and analyses including analytical balances, pH meters, dissolved oxygen meters, refrigerated centrifuges, variable-speed rotary shakers, hot plates, magnetic stirrers, shaker incubator, biochemical oxygen demand (BOD) incubator, total Kjeldahl nitrogen (TKN) digester and distillation apparatus, vortex mixers, refrigerator for chemical storage, spectrophotometer, digital refractometer, filtration apparatus, and recirculating water bath.

Ambient Condition Room
Bench-scale wastewater treatment studies and other experiments requiring ambient conditions are usually set up in this area. Located therein are the following: six (6) 5-liter UASB reactors with peristaltic pumps and gas meters, muffle furnace, dry ovens, chemical oxygen demand (COD) digestion apparatus, water bath, heaters, and refrigerator for sample storage. The Unit Operations Laboratory is in a separate building where two other laboratories, the Physical Chemistry Laboratory and Industrial Chemistry Laboratory are also located. These three laboratories are where experiments for instructional purposes are demonstrated or performed on several bench-scale and pilot-scale set-ups for fluid flow, heat transfer processes, mass transfer processes, reaction kinetics, and process control among others.

The USC-ChE Department offers the following laboratory Services:
Chemical Analyses
Physical Characterization of Samples
Bioassays
Short-term use of equipment
Maintenance and repair of some laboratory equipmentFabrication of experimental set-up

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Department of Civil Engineering

The Department of Civil Engineering of the University of San Carlos is a highly competent learning and research institution in the field of Civil Engineering, producing lifelong learners that contribute to the local, national and global development.

Research Interest

The Graduate Program offers two options:

- Masters of Science in Civil Engineering major in Water Resources and Environment
  Flood Forecasting, Processes in Hydrology, Neural Networks, Neuro-Fuzzy Techniques, Soil Erosion Processes, Slope Stability, Soil-Water Characteristics Curve, Soil Water Retention Behavior of a Soil in Slope, Rainwater Conservation and Management, Rainfall -Runoff Modelling, Rainfall Simulation, Water Distribution System

- Master of Engineering in Civil Engineering major in Structural Engineering
  Construction Material, Nanoscale Creep Mechanism of Concrete, Pre-Cast Wall Panels with Openings using Finite Element Approach, Software Development for Structural Analysis

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Facilities

The Department of Civil Engineering manages six teaching laboratories: fluid mechanics, soil mechanics, surveying, computer, construction and materials and the CE workshop laboratories. However, only four of these laboratories are utilized for the Graduate Program. These are:

- Fluid Mechanics Laboratory
- Soil Mechanics Laboratory
- Computer Laboratory
- Construction and Materials Laboratory

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Department of Computer Engineering

The Department of Computer Engineering is the leading institution Computer Engineering education. It is the first department to offer a 3-track program both in undergraduate and graduate degrees. It tailors to the demands of the computer and information technology industry and trends.

The Graduate Program is divided into the following tracks:

- Digital Systems Design
  Digital electronics, embedded systems, systems design using Field

- Computer Networks
  Network technologies (CCNA 1 & 2), server administration, network security, voice over Internet Protocol (VoIP). Included in the graduate program: distributed computing, grid and cloud computing.
- Software Engineering
  Systems analysis and design, design patterns, project management in software development, human-machine interaction, web and mobile programming.

Graduate students are assigned to the Graduate Research Lab (formerly Center for Robotics and Automation). The undergraduate students who are eligible for research support are assigned to the following laboratories:

- Computer Networks Laboratory
- NCR Software Development Laboratory
- NCR Advanced Development Laboratory
- Printed Circuit Board Laboratory
- Freescale Embedded Systems Laboratory
- Spansion Microcomputer Laboratory (unofficial name)
- Software Engineering Laboratory
- Apple Laboratory

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Facilities

Computer Networks Laboratory

The CNLab is the center for research in network security and distributed computing. It is equipped with servers, workstations and network appliances such as WiFi routers, switches, routers and gateways.

NCR Advanced Development Laboratory

The NCR ADL is a laboratory for undergraduate students developing hardware and software projects related to Retail Technologies and related technologies. Research include product identification using machine vision, smartphone-based POS, customizable POS-UI framework and machine-PWD interaction systems.

Printed Circuit Board Laboratory

The PCB Laboratory serves as a fabrication center as well as research in PCB fabrication technology. Research include multi-layer PCB design and fabrication, PCB inspection using machine vision and PCB reverse engineering algorithms.

Freescale Embedded Systems Laboratory

Part of the Digital Microprocessor Laboratory, it was established in 2007 to develop technologies using Freescale Semiconductor products such as Microcontrollers, Zigbee Transceivers and CAN controllers. Research in the laboratory include remote sensors, autonomous vehicles, force-feedback systems, buillding management systems using CAN and LAN, softcore processors and stereo-vision.

Spansion Microcomputer Laboratory

Established in collaboration with Lear Corp and Spansion (formerly Fujitsu Semiconductors), it will serve as an academic laboratory as well as a research lab in design of systems using 16-bit to 64-bit ARM CPUs utilizing RTOS and microkernel OS such as Linux.

Software Engineering Laboratory

This laboratory is setup to emulate industry processes and systems. It also aims to become a leading research center for software development management.

Apple Laboratory

This laboratory aims to support research and development by developing mobile applications that complements research in other laboratories. The laboratory does not only focus on consumer software but scientific applications as well. It is also a training laboratory for undergraduate and graduate students.

Computer Engineering

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Department of Electrical and Electronics Engineering

Equipping electrical and electronics engineers with knowledge and competencies for engineering research and development work

Research Interest

Communications and Broadcast Engineering Laboratory
Cognitive radio; wireless communications; radio propagation and antennas; RF engineering; data communication networks

Electrical Engineering Laboratory
Electrical machines; control systems; power systems

Electronics Laboratory
Power electronics

Microelectronics and Information Technology Laboratory
Analog, digital and mixed signal IC design; information technology

Special Applications Laboratory
Control systems; embedded systems; wireless sensor networks; digital signal processing; image processing; instrumentation; data acquisition systems

Graduate Degree Programs

M.Eng. in Electrical Engineering
M.Eng. in Electronics and Communications Engineering

Facilities

Maintenance and Calibration Workshop
Research equipment fabrication, laboratory equipment maintenance

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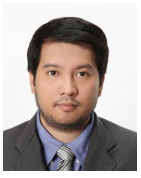

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Department of Industrial Engineering

Housed in one of the most prestigious academic institutions in the country, the IE Department of USC has been known to produce highly competent and well-rounded graduates that are capable of delivering reliable innovations that are relevant to their chosen field of specialization.

The Graduate Program of the Industrial Engineering caters to the academic or research needs of the students that he/she would like to specialize in through the offered elective courses. During the second year in the program (both 1st and 2nd semesters), the student is required to produce a research output that is publishable in quality. As a reinforcement to the chosen topic of his/her thesis, elective courses are to be taken. The research topics of the graduate students are aligned with the research agenda of the College of Engineering of USC, which are Food/Health, Water, Waste, and Energy.

As a venue to further leverage the provision of the students' academic and research needs, the Operations Research and Simulations Laboratory, and Methods Engineering and Ergonomics Laboratory were established.

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Facilities

Operations Research and Simulations Laboratory
This laboratory (situated in LB500ATC in the Engineering Building) is a computer laboratory. It can accommodate 25 students, with a 1:1 student-computer ratio. Among the applications

installed in the computers in this laboratory are the SAP Business One and Promodel. This laboratory also accommodates the course on basic MS Applications of undergraduate IE and IE-BP students. Students may also use the laboratory outside of their class hours, provided that it is related to the utilization of the applications that are installed in the laboratory. Finally, this laboratory also serves as venues during thesis defense of undergraduate IE and IE-BP students.

Methods Engineering and Ergonomics Laboratory

This laboratory is dedicated to performing activities that are relevant to the courses in Methods Engineering as well as Ergonomics Laboratory. The laboratory is equipped with creative tools (LEGO blocks, jigs and fixtures in the form of toys, etc.) to help develop the skills and knowledge required of the students for the methods engineering course. It is also equipped with tools that are useful in ergonomics, and are shared with methods engineering. Among these are Purdue Pegboard, Minnesota Dexterity Test, Sound and Light Meters, Anthropometer, and desktop computers for experiments that involve computer-human interaction. and Finally, this laboratory also serves as venues during thesis defense of undergraduate IE and IE-BP students.

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Department of Mechanical Engineering

A higher academic institution in the Central Visayas, Philippines for teaching and learning in the field of mechanical engineering. The academic instruction at the USC-DME adopts the Outcomes Based Education. Applying the mechanical engineering theories, USC-DME conducts research in line with the university's research agenda namely: Energy, Water, Waste and Food.

The Graduate program is divided into the following tracks:

- **Indoor Air Quality**
  Passive Cooling; Roof Spray Cooling; Ducting design, Clean Room Design
- **Conventional and Renewable Energy**
  Biomass Pyrolysis; Marine Current turbine; Conical Solar Chimney, Combustion
- **Mechanical Design**
  Mobile Coconut De-husker; Grain dryer, Mechanical Design and Simulation

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University of San Carlos

Facilities

Mechanical Design Laboratory

This laboratory is capable of doing concept design and product realization using the Solidworks and Pro-E softwares. The students who use this laboratory will learn 2D and 3D drawing. The 3D drawing includes part modeling, sheet metal, weldment, routing and assembly. The simulation package of the software is also used for research especially the flow, vibration and thermal simulation.

The laboratory is capable of catering forty students and currently serving the Chemical Engineering Department and Mechanical Engineering Department. Right now the laboratory is aiming to be the center of professional certification in Solidworks software and carry out outstanding research in the future.

Just recently (2013) the laboratory also acquire Kypipe software which is capable of doing transient analysis in fluid flow. This software is very useful in analyzing pumping system both transient and static condition.

Materials Testing Laboratory

The engineering materials and testing laboratory caters the needs for researchers, engineering students, faculty, and outside clients/suppliers in terms of material testing to determine: the tensile strength of metals and thermoplastics; the quality test for hot-dipped zinc coated longitudinal welded steel pipe; the quality test for unplasticized polyvinyl chloride pipes; pre-load hardness of materials; static bending; shear modulus and gage determination.

Hydraulic Machineries Laboratory

The hydraulics laboratory is equipped with hydraulic turbines like Francis, Kaplan and Pelton turbines which serve the needs of the students to have an actual hands-on in the operation of these turbines from starting and shutting down of the units. This hydraulic laboratory can extend to the students if they will conduct simulated experiments on turbines, pumps and fluid flows in an open channel. This is considered as one of the large scale hydraulic laboratory set-up.

Instrumentation Laboratory

This laboratory serves the needs for research and also the needs of the undergraduate and graduate students in the measurements of fluid flow; the discharge coefficient of venturi meter & flow coefficient of orifice flowmeter; vacuum gage calibration; temperature, pressure and power measurements. This laboratory has instruments for the study focusing on indoor air quality like linear displacement sensor, accelerometer, particle scan pro laser particle counter ,sensors and data loggers.

Fuels and Lubricants Laboratory

The Fuels and Lubricants Laboratory caters the needs for research, Mechanical Engineering Lab 2 students, and outside clients who needs analyses of their samples like oil and lubricants. It has the capability to determine the densities of the different petroleum products; the cetane index of distilled fuels; cloud point and pour points of petroleum oil; water content in petroleum products; viscosity and viscosity index of oil; rhe carbon residue test of petroleum products; the dropping point of lubricants; the flash and fire points and also the heat of combustion of liquid hydrocarbon fuels.

Mechatronics Laboratory

This laboratory exposes the students to the electro-pneumatics technology, a major component in mechatronics.

Power Laboratory
The students acquire operational knowledge by conducting experiments in SI and CI engines as well as steam boiler.

Refrigeration and Air conditioning Laboratory
The students learn in this laboratory how to trouble shoot actual operational problems in refrigeration and air conditioning systems.

Machine Shop
The machine shop of the department is well equipped to train student in machine shop practice. The laboratory has a state of the art CNC Milling machine, 2 units ordinary milling machine, 25 units lathe machines, 1 unit drill press, 1 unit radial drill, 1 unit boring machine, 9 units SMAW, 6 units TIG welding machine, and 1 unit MIG welding machine.
OS such as Linux.

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Mechanical Engineering