Mechanical Engineering Research Projects

Gokongwei College of Engineering
Mechanical Engineering Internally funded Projects
SY2012-2013 to AY2016-2017

Project Title/Number	Nature of Project	Proponent/Department
Physical and Combustion Characterization, Economic & Fuel Cycle Net Energy Analysis & Global Warming Potential Assessment of Various Jathropha-Diesel Slurry Fuel Blends in a Fuel Burning Equipment [original title: Technical, Environmental and Economic Analysis of Various Jatropha-Diesel Slurry Fuel Blends in Industrial Steam Generation] Replacement paper: Fumigation of Jatropha press cake producer gas in a diesel genset: Performance and emission characteristics 07 F U 1TAY11-1TAY12	FRP	Dr. Archie Maglaya Dr. Jose Bienvenido Manuel Biona *(Mechanical Engineering)*
Design and Development of a Low-Cost Dynamic Machine 49 F U 3TAY04-3TAY05	FRP	Mr. Isidro Marfori III Mr. Byron Omboy *(Mechanical Engineering)*
Process Improvement of the Algae Industry in the Philippines 38 F U 3TAY15-3TAY16	FRP-External	Dr. Aristotle Ubando *(Mechanical Engineering)*
Identification of Design Criteria for District Cooling Distribution Network with Loop System 39 N 3TAY15-3TAY16	New Ph.D. Grant	Dr. Gerardo Agusto *(Mechanical Engineering)*
Assessment of the Professional Education in the Field of Engineering in the Philippines: The Development of Multidiversity 20 F U 2TAY15-2TAY16	FRP	Dr. Alvin Culaba *(Mechanical Engineering)*
Research and Development of a Low-Cost Semi-Automated Sugarcane Harvester for Productivity Advancement of Local Industry 67 F U 4TAY14-3TAY15	FRP	Mr. Efren Dela Cruz Mr. Jeremias Gonzaga *(Mechanical Engineering)*

Determination of Demand based PV Tilt Using Mechatronic Approach 12 F U 1TAY15-1TAY16	FRP	Dr. Alvin Chua *(Mechanical Engineering)*
Automated microalgae growth rate characterization using vision system 03 IR 3TAY14-3TAY15	IR	Dr. Elmer P. Dadios *Proj. Coordinator, ME* *Project Team Members:* Dr. Alvin B. Culaba, *ME* Dr. Bjorn Santos, *Biology* Dr. Edwin Sybingco, *ECE* Dr. Aristotle T. Ubando, *ME*
A Molecular Dynamics Investigation of Extracting Water from *Nannochloropsis sp.*: A First Step in the Design, Fabrication and Testing of Novel Catalytic Materials in Microalgae Drying for Biofuel Production 05 IR 3TAY14-3TAY15	IR	Dr. Melanie David *Proj. Coordinator, Physics* *Project Team Members:* Dr. Alvin Culaba, *ME* Dr. Aristotle Ubando, *ME* Dr. Al Rey Villagracia, *Physics* Dr. Nelson Arboleda, *Physics*
The Feasibility of Using Bamboo Pipes as a Low-cost, Environment-friendly Alternative to Polyvinyl Chloride (PVC) Pipes in Hydroponic Vegetable Production 11 IR S 4TAY14-1TAY16	IR	Dr. Florencia Claveria *Proj. Coordinator, Biology* *Project Team Members:* Dr. Nadine Ledesma, *Biology* Dr. Eric Punzalan, *Chemistry* Mr. Jeremias Gonzaga, *ME* Ms. Ellenita De Castro, *Biology* Dr. Marites Tiongco, *SOE*
Starting up a microalgae culture collection at DLSU with profiling of selected bio-compounds from freshwater microalgae collected in the vicinity of DLSU-Science & Technology Complex, Biñan, Laguna 10 IR 4TAY14-3TAY15	IR	Dr. Emelina Mandia *Proj. Coordinator, Biology* *Project Team Members:* Dr. Jose Isagani Janairo, *Biology* Mr. Lawrence Victor Vitug, *Biology* Dr. Aristotle Ubando, *ME* Dr. Rafael Espiritu, *Chemistry*

Review and Revision of Mechanical Engineering Laboratory Manuals 33 M U 2TAY14-2TAY15	FRP-Materials Dev't	Mr. Gerardo Augusto Dr. Archie Maglaya Mr. Neil Stephen Lopez Mr. Josue Robertson Reyes *(Mechanical Engineering)*
Selection of Algal Cultivation Sites in the Philippines 58 N 3TAY14-3TAY15	New Ph.D.	Dr. Aristotle Ubando *(Mechanical Engineering)*
Design and Development of the Mechatronics of an Autonomous Underwater Vehicle 38 F U 3TAY12-3TAY13	FRP	Dr. Laurence Gan Lim *(Mechanical Engineering)*
Development of Unmanned Aerial Vehicle Quadrotor Swarm 02 IR 1TAY14-1TAY15	IR	Dr. Elmer Dadios *Project Coordinator, MEM* *Project Team Members:* Dr. Laurence Gan Lim, *Mechanical Engineering* Dr. Florante Salvador, *Software Technology* Mr. Argel Bandala, *ECE*
Simulation of a Flotation System for Cars 27 F U 1TAY14-3TAY14 Papers: *A General Simulation Methodology for Rigid Buoyant Objects in Multi-phase Flows Using ANSYS-CFX* (presented and published in the Proceedings of the 2014 Regional Conference in Mechanical and Manufacturing Engineering, October 9, 2014, Hanoi, Vietnam) CFD Modeling of Buoyant Rigid Bodies Using ANSYS CFX for Design of Flotation Equipment (submitted for review in the Philippine Science Letters (ISI Journal)	FRP	Dr. Alvin Chua Mr. Conrad Allan Jay Pantua *(Mechanical Engineering)*

Design and Development of Underwater Robot System 01 IR U 1TAY12-1TAY13 Papers Presented: 1. "Unmanned Underwater Vehicle Navigation and Collision Avoidance Using Fuzzy Logic" 2013 IEEE/SICE International Symposium on System Integration, December 15-17, 2013, Kobe International Conference Center, Kobe Japan. 2. "Design and Development of a Cooperative Underwater Swarm Robot System" 3. "Neural Network based Model of an Omnidirectional Underwater Robot" 4. "Simple Robot Path Planning Simulator using Genetic Algorithm" 6th International Conference on Humanoid, Nanotechnology, Information Technology, Communication and Control, Environment, and Management 2013 (HNICEM 2013), November 12-14, 2013, Henry Sy Hall, De La Salle University. Papers qualifies for publication in the Journal of Advanced Computational Intelligence and Intelligent Informatics (JACIII) 1. "Design and Development of a Cooperative Underwater Swarm Robot System" 2. "Neural Network based Model of an Omnidirectional Underwater Robot" **IR Symposium was held on December 3, 2014, 13/F EDC Multi-purpose Room, HSSH.*	IR	Dr. Elmer Dadios *Project Coordinator, MEM* *Project Team Members:* Dr. Alvin Culaba, ME Mr. Edwin Sybingco, *ECE* Mr. Laurence Gan Lim, *ME*
Use of Computer Vision to Control the Water Quality of Tiger Prawn Aquaculture Based on Its Behavioral patterns 02 IR U 1TAY12-1TAY13 **Papers presented:** 1. *Identifying Water Quality Index for Small Scale Tiger Prawn Aquaculture Setup Using Neuro-Fuzzy Techniques* 6th International Conference on Humanoid, Nanotechnology, Information Technology, Communication and Control, Environment, and Management (HNICEM) 2013. 2. *Machine Vision Stress Level Detection of Individual Tiger Prawn based on its Behavioral Movements* 7th IEEE HNICEM/ISCIII/ERDT 2014 3. *Neuro-Fuzzy control Techniques for Optimal Water quality Index in a Small Scale Tiger Prawn Aquaculture Set up* Published in the Journal of Advanced Computational Intelligence and Intelligent Informatics (JACIII) Vol 18, No.5. **IR Symposium was held on December 3, 2014, 13/F EDC Multi-purpose Room, HSSH.*	IR	Dr. Elmer Dadios *Project Coordinator, MEM* *Project Team Members:* Mr. Reggie Gustilo, *ECE* Mr. Laurence Gan Lim, *ME* Dr. Edwin Calilung, *MEM*

Development of a Model in Optimizing a Biomass-Based Polygeneration Supply-Chain using Fuzzy Multi-objective with Triple Footprint Constraints 37 F U 3TAY12-2TAY13 Published paper: Fuzzy Multi-Objective Approach for Designing of Biomass Supply Chain for Polygeneration with Triple Footprint Constraints ASME 2013 International Mechanical Engineering Congress & Exposition	FRP	Engr. Aristotle Ubando *Mechanical Engineering*
Classification of Colonic Mucosa Microscopic Images Using a Combination of Genetic Algorithms, Artificial Neural Networks, and Fuzzy Logic 04 F U 1 07 Accepted paper: *Implementation of GA-KSOM and ANFIS in the Classification of Colonic Histopathological Images* (refereed and accepted for presentation and publication in the upcoming IEEE Regional conference entitled TENCON 2012, Cebu City, Nov. 19-22, 2012.	FRP	Dr. Laurence Gan Lim *Mechanical Engineering*
The Study of the Microalgae Post-cultivation Processes for Biofuel Production with Concentration on Biomass Drying 10 IR S/C 3 10 Papers: • Generation of Empirical Equations and Trend Lines for the Drying Rate of Nannochloropsis sp. On a Glazed Cabinet0type Solar Dryer • Characterization of Solar Drying of Tetraselmis sp. For biofuel production using a laboratory-scale setup and Statistical analysis Presented in the 4th AUN/SEED-Net RC MeAe 2012 January 10-11,2012, HCMUT, Vietnam	IR	Dr. Alvin Culaba *Proj. Coordinator, ME* *Project Team Members:* Dr. Raymond Tan, *Chemical Engineering* Dr. Joel Tanchuco, *Economics* Engr. Aristotle Ubando, *Mechanical Engineering*

Externally Funded completed Research Projects
Mechanical Engineering Department
AY2012-2013

Project Title	Project Director/ Coordinator	Funding Agency/ Project Duration/Status
Vison Based Pedestrian Detection Using Motion and Boosted Histogram of Oriented Gradients GCOE CESDR 41 L 2TA11-2TA12	Dr. Alvin Chua	DOST-ERDT June 2012 Completed
Automated Bulk Cartoning of Folded Sachet Linked Strips Using Constrained Gravity Stacking GCOE CESDR 31 L 2TA11-2TA12	Dr. Alvin Chua	DOST-ERDT October 2012 completed

AY2013-2014

Project Title	Project Director/ Coordinator	Funding Agency/ Project Duration/Status
A Molecular Dynamics Study on the Effects of Osmotic Pressure on the Lipids of Microalgae Chlorella Vulgaris GCOE CESDR 44 L 3TAY10-2TAY12	Mr. Aristotle Ubando	DOST-ERDT 3rd term 10-11 - 2nd term 12-13 completed
Investigation of the Effects of Blade Profile Geometry in a Hinged Blade Cross Axis Turbine GCOE CESDR 45 L 1TAY11-3TAT12	Mr. Isidro Antonio Marfori	DOST-ERDT 1st term 11-12 - 3rd term 12-12 completed

AY2014-2015

Project Title	Project Director/ Coordinator	Funding Agency/ Project Duration/Status
Development of a Probabilistic Liquefaction Potential Map for Metro Manila	Dr. Jonathan Dungca	DOST-ERDT 1st term 13-14 - 2nd term 14-15 completed

AY2015-2016

Project Title	Project Director/ Coordinator	Funding Agency/ Project Duration/Status
Development of Breast Cancer Self Examnation (BSE) Multimedia System for the Philippines CHED-Phernet 53g L 2TA14-1TA15	Dr. Elmer Dadios Dr. Laurence Gan Lim Mr. Melvin Cabatuan	CHED-Phernet December 1, 2014- November 30, 2015 (completed)
Development of Process Systems Engineering (PSE) Approaches to the Design and Operation of Low-Carbon Energy Systems CHED-Phernet 53b L 2TA14-1TA15	Dr. Raymond Tan Dr. Kathleen Aviso Dr. Michael Promentilla Dr. Aristotle Ubando	CHED-Phernet December 1, 2014- November 30, 2015 (completed)

CONTINUING and ONGOING PROJECTS
AY2016-2017

Project Title	Project Director/ Coordinator	Funding Agency/ Project Duration/Status
Contactless apprehension of traffic violators on 24-hour basis and all-vehicle detection system (CATCH-ALL) GCOE CESDR 71 1TA15-1TA16	Dr. Elmer Dadios Dr. Laurence Gan Lim Dr. Argel Bandala Engr.Edwin Sybingco Dr. Alexis Fillone	PCCIERD-GIA November 5, 2015 to November 6, 2016 (ongoing)
Experimental, Performance, and Fuel Cycle Analysis of Jatropha Diesel Fuel Slurry GCOE CESDR 41 L 2TAY09-1TAY11	Dr. Archie Maglaya/ Dr. Biona	DOST-ERDT 2nd term 09-10 - 1st term 11-12 (ongoing)
Optimization of the Design of the Transmission Mechanism GCOE CESDR 42 L 2TAY08-1TAY11	Dr. Archie Maglaya	DOST-ERDT 2nd term 08-09 - 1st term 11-12 (Ongoing)
Investigation of the effects of the drying temperature amd velocity to the lipid content of microalagae Chorella Vulgaris GCOE CESDR 43 L 2TAY11-3TAY12	Mr. Aristotle Ubando	DOST-ERDT 2nd term 11-12 - 3rd term 12-13 (Ongoing)
Development of a Building Energy Efficiency Benchmark and Intervention Model	Dr. Jose Bienvenido Manuel Biona	DOST-ERDT 3rd term 11-12 - 2nd term 13-14 (Ongoing)

A Molecular Dynamics Study on the effects on the effects of Introducing a Solute in the Drying Process of Microalgae Nanochlorosis GCOE CESDR 88 L 2TAY10-1TAY12	Dr. Alvin Culaba	DOST-ERDT 2nd term 12-13 - 1st term 14-15 (Ongoing)