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Representative from Ordem dos Engenheiros de Angola

CONFEA – CONSELHO FEDERAL DE ENGENHARIA, ARQUITECTURA E AGRONOMIA

Representative from CONFEA

ORDEM DOS ENGENHEIROS DE CABO VERDE

Representative from Ordem dos Engenheiros de Cabo-Verde

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**ORDEM DOS ENGENHEIROS DE MOÇAMBIQUE**

Representative from Ordem dos Engenheiros de Moçambique

**ORDEM DOS ENGENHEIROS DE PORTUGAL**

Representative from Ordem dos Engenheiros de Portugal

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Anne Nortcliffe, Andrew Middleton

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Lucy C. Morse

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Antonio José Pithon, Marina Rodrigues Brochado

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A CASE STUDY OF A NAVIGATOR'S SEA APTITUDE USING BODY RESPONSE TO VISUAL SIMULATION

Koji Murai, Yuji Hayashi, Laurie Stone

PITFALLS OF TECHNOLOGY ENHANCED EDUCATIONAL TOOLS FOR ENGINEERING EDUCATION

Sukhmander Singh

#### **SESSION T2F - NEW APPROACHES AND TOOLS – Virtual Laboratories (I)**

IMPROVEMENT OF QUALITY OF PREPARATION OF ENGINEERS IN ROBOTICS BY USING OF GRID-TECHNOLOGIES

Alexander Bolshakov, Olga Dolinina, Alexey Bolshakov, Alexander Lavrov

USING WEB-BASED LABORATORIES FOR CONTROL ENGINEERING EDUCATION

Sebastián Dormido Bencomo, Hector Vargas Oyarzun, José Sánchez Moreno, Raquel

Dormido Canto, Natividad Duro Carralero

VIRTUAL LABORATORY ARRANGEMENT FOR MEASURING CHARACTERISTIC POWER SYSTEM QUANTITIES

Anastasia Safigianni, Pournaras Stavros

THE DEVELOPMENT OF REMOTE ACCESS COMPUTER-AIDED LABORATORIES AND THEIR USE AT TECHNICAL UNIVERSITIES

Alexander Zimin

WEBLAB IN CHEMICAL ENGINEERING BETWEEN FRANCE AND BRAZIL:

VALIDATION OF THE METHODOLOGY

Marion Alliet Gaubert, Xavier Joulia, Antonio J. G. Cruz, Roberto Giordano, Galo Carrillo Le Roux

IT-ENHANCED LABORATORY EXPERIENCE WITHIN A MODERN UNDERGRADUATE ENGINEERING CURRICULUM

EL-Sayed Aziz, Sven Esche, Constantin Chassapis

#### **SESSION T2G - SPECIAL SESSION S1. E-Learning for Architectural Design, Product Design and Engineering Design (I)**

A VISUAL METAPHOR REPRESENTATION OF A DESIGN PROCESS MODEL

Graham Oakes, Amal Oraifige, Anthony Felton, David Heesom

THE ROLE OF SPATIAL VISUALISATION ABILITY IN ARCHITECTURAL CURRICULA - NEW TENDENCIES IN TEACHING GEOMETRY AND GRAPHICS

Ksenija Hiel, Radovan Stulic  
APPLICATION OF CATALAN SURFACE IN DESIGNING ROOF STRUCTURES – AN  
IMPORTANT ISSUE IN THE EDUCATION OF A FUTURE ARCHITECT ENGINEER

Jolanta Tofil  
MOVING TO RAPID CAD TRAINING  
Xiandong Feng, Oliver Turley, David Heesom, Anthony Felton  
FMS SIMULATOR  
Jussi Horelli, Matti Väänänen

### **SESSION T2H - SPECIAL SESSION S3. Education and Training for the Forestry Based Industries**

PILOT PROJECT: TO LEARN BY TEACHING  
Carlos Negro, Angles Blanco  
AN ENGINEERING COURSE FOR FRESHMEN: SIMULATING A MANAGEMENT  
COMPANY  
Therezinha da Costa, Isnard Martins, Marcos da Silveira  
THE GAP BETWEEN ACADEMIC SKILLS AND THE SKILLS NEEDED FOR THE  
INDUSTRY  
Fernando Torgal  
POSTGRADUATE EDUCATION ON PULP AND PAPER ENGINEERING IN SPAIN  
Angels Pèlach, Pere Mutjé, Antonio Torres, José F. Colom  
DESIGN AND DEVELOPMENT OF A LOW COST PROGRAMMABLE LOGIC  
CONTROLLER WORKBENCH FOR EDUCATION PURPOSES  
Abd Almotaleb Kheiralla, Osama Siddig, Ahmad A. Elhaj Mokhtarb, Montasir Esameldeen,  
Osama Abdalla

### **SESSION T3A - THE CHALLENGES OF RESEARCH – Emerging Engineering Areas**

ENGINEERING EDUCATION AS AN AREA OF THE SCIENTIFIC KNOWLEDGE  
Vanderli Fava Oliveira, Danilo Pereira Pinto  
INTRODUCTION TO SYSTEMS APPROACH USING BIO-ENERGY RESOURCES AS A  
TOOL FOR FRESHMAN ENGINEERING EDUCATION  
Kumar Mallikarjunan, Anand Lakshmikanth, Mary Leigh Wolfe, Vinod Lohani, Jeff Connor  
USING OF THE TECHNOLOGY OF PARALLEL PROGRAMMING FOR SOLVING APPLIED  
PROBLEMS  
Gulnar Balakayeva, Galymbek Seralin  
THE PROGRESS OF THE STUDY BRANCH BIOMEDICAL TECHNOLOGY AT VSB  
TECHNICAL UNIVERSITY OSTRAVA VIA THE EUROPEAN SOCIAL FUND  
Jindrich Cernohorsky, Hana Sochorova, Marek Penhaker, Petr Tiefenbach  
THE TECHNICAL REHEARSALS IN THE PREPARATION OF THE OFFICIAL PARADE OF  
SAMBA SCHOOLS IN THE CARIOCA CARNIVAL: A CONTRIBUTION ON  
PERFORMANCE MANAGEMENT FOR THE ENGINEERING  
Mirian Martins da Motta Magalhães, José Antonio Assunção Peixoto, Leydervan de Souza  
Xavier, Antonio Marcos Muniz Carneiro

### **SESSION T3B - THE CHALLENGES OF RESEARCH – Encouraging Creativity**

ATTITUDES AND VALUES IN ENGINEERING STUDENTS: THE HUMAN  
DEVELOPMENT SCALE  
Mariana Ruiz Morales  
CREATIVE ENGINEERING EDUCATION IN COLLABORATION WITH LOCAL  
COMMUNITY  
Kazuya Takemata, Masakatsu Matsuishi, Shigeo Matsumoto, Tetsuro Furukawa, Taketo  
Yamakawa  
A CREATIVITY COURSE FOR ENGINEERS  
Victor Valqui Vidal  
IMPROVING PROBLEM SOLVING AND ENCOURAGING CREATIVITY IN  
ENGINEERING UNDERGRADUATES  
Jonathan Adams, Stefan Kaczmarczyk, Phil Picton, Peter Demian  
AN ATTEMPT TO GET MORE CREATIVITY TO THE TRAINING PROGRAMME OF  
ENGINEERS  
Jukka Tuohi

**SESSION T3C - THE CHALLENGES OF RESEARCH – Electrical Engineering**

ACCEPTANCE OF 3D VISUALIZATION METHODS BY LEARNING AND TRAINING IN THE AREA OF ELECTRICAL ENGINEERING

Angel Nikolaev Angelov, Tomasz Smieja, Zbigniew Styczynski

SEEDING ENQUIRY-BASED LEARNING IN ELECTRICAL AND ELECTRONIC ENGINEERING: CASE STUDY 1 – OPTOELECTRONICS

Norman Powell, Tony Peaker, William Truscott, Peter Hicks, Brian Canavan

CHANGING TOOLS AND METHODS IN ENGINEERING EDUCATION

Jerzy Moscinski

ELECTRICAL TWO-PORTS; A MAPLE APPROACH

Amir Hossein Khanshan

TROUBLESHOOTING EXERCISES USING CIRCUIT SIMULATOR SOFTWARE: SUPPORT FOR DEEP LEARNING IN THE STUDY OF ELECTRONIC CIRCUITS

George Banky, Kwong Wong

**SESSION T3D - PARTNERSHIP – Challenges of Globalization**

HIGHER EDUCATION IN THE GLOBALIZATION ERA

Wojciech Zielinski

FOSTERING INTERNATIONAL PARTNERSHIPS TO ENHANCE ENGINEERING EDUCATION AND RESEARCH: CASE STUDIES ON EFFECTIVE RELATIONSHIPS

Patricia Fox, D. Jan Cowan, Stephen Hundley, J.P. Mohsen, Kay Wilding

GLOBAL EXPERIENCES FOR AVIATION STUDENTS

Ronald Sterkenburg, Sergey Dubrovoski

THE MOTIVATION AND ROLE OF PERSONAL STRATEGY FOR STUDYING FOREIGN LANGUAGES IN TECHNICAL COLLEGES

Barbara Danilova, Oleg Moroz, Julije Svabova

THE THREE AXES OF ENGINEERING EDUCATION

E. Dan Hirleman, Eckhard Groll, Dianne Atkinson

**SESSION T3E - WHAT DEGREES FOR WHAT JOBS? – Defining the Levels of Engineering Practice**

COOPERATIVE EDUCATION IN BRAZIL: COORDINATING WORK TERMS

Claudio Roberto De Freitas Pacheco

A GRADUATE CURRICULUM FOR ENGINEERING LEADERSHIP

Stephen McKnight, John Beaty, Philip Cheney, Michael Silevitch

TEACHING GEOTECHNICAL WORKS USING PROFESSIONAL PRACTICE

Teresa Santana, Ana Quintela

USING TREND ANALYSIS TO INFLUENCE NEW COURSE PRODUCTION

Phil Picton

INDUSTRIAL DESIGN EXPOSURE TO THE ENGINEERING STUDENTS IN INDIAN CONTEXT

Amarendra Das

**SESSION T3F - WHAT DEGREES FOR WHAT JOBS? – The Bologna Process (II)**

ECTS EVALUATION IN THE FACULTY OF COMPUTER SCIENCE OF THE POLYTECHNIC UNIVERSITY OF VALENCIA

Antonio Molina Marco, Andrés Terrasa Barrena, Eduardo Vendrell Vidal, Emilio Sanchis Arnal

ABILITIES REQUIRED FOR THE FORESEEABLE FUTURE AND THEIR DEVELOPMENT IN HIGHER EDUCATION OF SCIENCE AND ENGINEERING

Ryunosuke Kikuchi

RE-THINKING THE CURRICULA FOR ELECTRICAL ENGINEERING EDUCATION IN SERBIA – CASE OF THE AUTONOMY PROVINCE OF VOJVODINA

Djuro Kutlaca, Vojin Senk

SOME REFLECTIONS ON THE NEEDS OF MATHEMATICS EDUCATION FOR ENGINEERING STUDIES: THE CASE OF ISEP

Alcinda Barreiras

### **SESSION T3G - WHAT DEGREES FOR WHAT JOBS? – Assessment of Engineering Education**

**(I)**

#### **ASSESSMENT TO IMPACT ENGINEERING RETENTION**

Susan Haag

#### **THE IMPROVEMENT OF THE ENGINEERING EDUCATION - ANALYSIS OF A CASE STUDY RELATED TO AN INQUIRY ABOUT STUDENTS' PERCEPTION**

Antônio Betâmio de Almeida, Susana Sequeira

#### **THE USE OF QUALITATIVE INDICATORS TO EVALUATE PROFESSORS FROM AN ENGINEERING COURSE OF A PUBLIC UNIVERSITY IN SÃO PAULO**

Ana Cecília Pontes Rodrigues, Cecília Carmen Cunha Pontes, Dirceu da Silva

#### **ENGINEERING GRADUATES' ASSESSMENT OF ACADEMIC PREPARATION FOR NEXT STEPS**

Patricia Schmolze, Francisco Chang, Melora Sundt

#### **QUALITY ASSURANCE AND ASSESSMENT IN TECHNICAL EDUCATION SYSTEM: A WEB BASED APPROACH**

Pallapa Venkataram, Anandi Giridharan

### **SESSION T3H - WHAT DEGREES FOR WHAT JOBS? – Assessment of Engineering Education**

**(II)**

#### **COMPUTERIZED DYNAMIC ASSESSMENT**

Nirmal Khandan

#### **ASSESSMENT OF PROGRAM OUTCOMES BY USING POMAS**

Sema Oktug

#### **WORK IN PROGRESS –QUALITATIVE ANALYSIS OF THE DIFFERENT ASSESSMENT IMPLEMENTATION METHODS IN A SCHOOL OF ENGINEERING. PRELIMINARY RESULTS**

Amparo Camacho, Javier Paez, Javier Visbal

#### **DESIGNING INDICATORS TO MEASURE THE QUALITY OF ENGINEERING COURSES: THE CASE OF ESCOLA POLITÉCNICA DA UNIVERSIDADE DE SÃO PAULO**

Oswaldo Nakao, José Grimoni

#### **ELIMINATING CORRELATIONS AND REDUNDANCY IN ACADEMIC EVALUATION QUESTIONNAIRES THROUGH MULTIVARIATE ANALYSIS**

José Carlos Grizendi, Francisco José Gomes

### **SESSION W1A - REDISCOVERING THE FOUNDATIONS – Mathematics**

#### **GEOMETRY - AIMS, TASKS AND METHODS**

Stanislaw Sulwinski, Krzysztof Tytkowski

#### **PHYSICAL MODEL IN DESCRIPTIVE GEOMETRY – GOOD IDEA?**

Monika Sroka-Bizon

#### **GEOMETRY AND ENGINEERING GRAPHICS IN ENGINEERING EDUCATION ILLUSTRATED BY EXAMPLE OF ADVANCED 3D MODELING COURSE**

Monika Sroka-Bizon, Krzysztof Bizon

#### **OFFSETTING THE OBJECTS USING SEGMENTATIO**

Amod Tiwari, A. Chatterjee, V. Phatak, S. G. Dhande

#### **ENHANCING THE TEACHING & LEARNING OF DIFFERENTIAL EQUATIONS VIA WRITING REFLECTIONS -A CASE STUDY**

Azizan Zainal Abidin

#### **CONTRIBUTION TO POSTCRITICAL NON-LINEAR BEHAVIOUR OF ELASTIC PLANE TRUSSES DISCRETISED BY FEM - COMPARISON RESULTS OBTAINED BY “EXACT METHODS” WITH NEWTON- RAPHSON METHOD**

Milada Hlaváčková, Dagmar Juchelkova

### **SESSION W1B - REDISCOVERING THE FOUNDATIONS – New Competencies - Soft Skills**

#### **DEVELOPING SOFT SKILLS IN ENGINEERING STUDIES – THE EXPERIENCE OF STUDENT'S PERSONAL PORTFOLIO**

Artur Silva, José Tribolet

#### **THE TEAMWORK IMPACT ON LABORATORY SESSIONS AND ITS CONTRIBUTION TOWARDS GRADUATE ATTRIBUTES**

Daniela Ionescu

#### **STUDENT PERCEPTIONS OF “SOFT” SKILLS IN MECHANICAL ENGINEERING**

Rosetta Ziegler  
SOCIAL AND SOFT SKILLS CONCEPT IN ENGINEERING EDUCATION  
Gerhard Hillmer  
THE ROLE OF HARD AND SOFT SKILLS ON ENGINEERING EDUCATION  
Júlio Martins, Marinho Duarte, Sérgio Cunha, Bernardo Almada-Lobo, António Torres Marques  
PLAYERS OF SOCIAL RESPONSIBILITY IN ENGINEERING PROFESSIONAL EDUCATION IN BRAZILIAN - SCENARIO SINAES1 - NATIONAL SYSTEM FOR SUPERIOR EDUCATION ASSESSMENT  
Leydervan Xavier, José Antonio Peixoto, Lilian Martins da Motta Dias

**SESSION W1C - REDISCOVERING THE FOUNDATIONS – Entry Level**

A YEAR-LONG ENTRY-LEVEL COLLEGE COURSE SEQUENCE FOR ENHANCING ENGINEERING STUDENT SUCCESS  
Tony L Mitchell, Angelitha Daniel  
PROMOTION OF ENGINEERING PROFESSION AND EDUCATION IN ELECTRONICS  
Ilmars Slaidins, Marite Treijere  
EFFECTIVE RETENTION STRATEGIES FOR ENGINEERING STUDENTS  
Kerri Sleeman, Sheryl Sorby  
REFLECTIONS ON THE "BASIC CYCLE" OF THE ENGINEERING STUDIES AT THE ESCOLA POLITÉCNICA DA UNIVERSIDADE DE SÃO PAULO: CONTEMPORANEITY AND PROBLEMS.  
Haydée Svab, Giuliano Olguin, Henrique Gaspar, Clarice Aiello, Andre Antunha  
COMPARING PRESENT OUTCOME DATA TO THAT UTILIZING BLOOM'S TAXONOMY  
Enno Koehn, James Koehn  
COOPERATIVE EDUCATION: A PROPOSAL TO INCREASE THE NUMBER OF ADMITANCES OF STUDENTS INTO THE BRAZILIAN PUBLIC HIGHER EDUCATION INSTITUTIONS  
Patricia Lara dos Santos Matai, Shigueharu Matai

**SESSION W1D - SPECIAL SESSION S2. New Tech in Math for Engineering and other Sciences (I)**

NEW CHALLENGES, NEW APPROACHES: A NEW WAY TO TEACH MATHEMATICS IN ENGINEERING  
Agustin De La Villa, Felix Alonso, Gerardo Rodriguez  
APPLIED MATHEMATICS AND COMPUTATIONAL MODELING IN ENGINEERING  
Zuzana Krivá, Karol Mikula  
IMPLEMENTATION OF IDP TECHNIQUE BY THE USE OF MATLAB SOFTWARE AS A TOOL FOR THE CHEMICAL ENGINEERING EDUCATION  
Paulo Roberto Alves Pereira, Ana Maria Frattini Fileti  
INCREASING THE LEARNING OUTCOME IN MATHEMATICS BY USE OF COMPUTER PROGRAMS LIKE MATHEMATICA  
Ivar Johannesen  
UTILIZATION OF NEW TECHNOLOGIES IN SCIENCE TEACHING TO IMPROVE STUDENT LEARNING AT ENGINEERING INTRODUCTORY PHYSICS COURSES  
Edson Pedro Ferlin  
THE IMPACT OF WEB-BASED MATERIALS ON STUDENT LEARNING AND COURSE DELIVERY IN ENGINEERING MATHEMATICS  
Kevin Golden, Stephen Lee

**SESSION W1E - SPECIAL SESSION S5. Involving Engineering Schools and Universities in Technical and Scientific Education for School Outreach (I)**

EXPOSITORY PROGRAMS: AN EFFECTIVE APPROACH TO ENHANCE K-12 ENGINEERING EDUCATION  
Juan Lopez-Garriga  
ASSESSMENT OF HIGH SCHOOL STUDENTS' EXPOSURE TO ENGINEERING VIA A SUMMER CAMP  
Karinna Vernaza, Theresa Vitolo, Scott Steinbrink, Barry Brinkman, Frank Bogacki

INCREASING ENROLLMENT OF FIRST-TIME-FULL TIME FRESHMAN (FTFTF) IN STEM MAJORS

Joel Bloom, Kathryn Kelly

UNIVERSAL DESIGN IN COMPUTER SCIENCE EDUCATION AND SYSTEMS DEVELOPMENT

Kirsten Ribu, Miriam Nes

DEVELOPMENT AND IMPLEMENTATION OF A COMPREHENSIVE NANO-EDUCATION PROGRAM

Nancy Healy, Diana Palma

MANUFACTURING TECHNOLOGY IN MIDDLE SCHOOL CLASSROOMS: A COLLABORATIVE APPROACH

Constance Ziemian, John Aument

**SESSION W1F - SPECIAL SESSION S10 – Professionalism and Ethics in Engineering Education**

ENGAGING TWENTY-FIRST CENTURY LEARNERS

Peter Willmot, Tony Sutton, Sarah Bamforth

ENGINEERING ETHICS

Helena Pálková, Veronika Svobodová

AVOIDING PLAGIARISM AND COLLUSION

Dana Dobrovská, Pavel Andres, David Vanecek, Antonin Pokorny

DEVELOPMENT OF A COURSE ON ENVIRONMENTAL SUSTAINABILITY, ETHICAL DECISION-MAKING AND COMMUNICATION SKILLS IN ENGINEERING

Abbas El-Zein, David Airey, Peter Bowden, Henriikka Clarkeburn

TEACHING ETHICS FOR URBAN PLANNERS AND ARCHITECTS

Tadeusz Kuczynski, Alicja Kuczynska

ENGINEERING ETHICS EDUCATION IN CHINA: AN EFFECTIVE WAY TO INTEGRATE HUMANITIES EDUCATION INTO ENGINEERING EDUCATION

Chui-qian Kong

**SESSION W1G - SPECIAL SESSION S11 – Addressing Emerging Technologies in an Engineering Curriculum**

ARE THE CURRICULA ABLE TO FOLLOW THE DEVELOPMENT TRENDS IN BROADBAND DATA COMMUNICATIONS?

Tomáš Vrba, Aleš Kumpera, Tomáš Zeman

A SATELLITE COMMUNICATIONS COURSE IN UNDERGRADUATE ELECTRICAL ENGINEERING CURRICULUM: AN ENDEAVOR TO COPING WITH THE CHANGING DISCIPLINE BOUNDARIES

Habib Rahman

EDUCATION IN DATA TRANSMISSION LABORATORY RESPECTING THE PRINCIPLES OF ELECTROMAGNETIC COMPATIBILITY

Tomas Zeman, Jaromír Hrad, Tomas Vrba

TRANSMISSION AND SWITCHING SYSTEMS: TRENDS OF TECHNOLOGY IN EDUCATION

Jiří Hájek, Tomáš Vrba

NEW EDUCATION TRENDS IN THE INTERDISCIPLINARY AREAS OF ELECTROMAGNETIC COMPATIBILITY

Jaroslav Svoboda, Jaromír Hrad, Tomas Zeman

IMPORTANCE OF LABORATORY EXPERIENCE IN GENERAL SUBJECTS

Jaromír Hrad

**SESSION W1H - Teaching Practice and Exposing Students to the Nature of Engineering**

A CASE STUDY IN USING THEORY OF CHANGE TO IMPROVE TEACHING PRACTICE IN A CONTROL DEPARTMENT

John Anthony Rossiter, Linda Gray, Gabi Diercks O'brien

BRINGING ENGINEERING INTO K-12 SCHOOLS: A PROBLEM LOOKING FOR SOLUTIONS?

Howard Kimmel, John Carpinelli, and Ronald Rockland

STUDENTS EVALUATING SIGNIFICANT FACTORS ON RETENTION: A STATISTICAL ANALYSIS

Fernando Tovia, Yan Liu

WORK SITES AS A HALFWAY THROUGH TEACHING AND RESEARCH

Cristina Tudela Andreu, Concepción López González, Jesús Mene Aparicio, M<sup>a</sup> Luisa Navarro García

LOW-COST MINIATURIZED CHROMATOGRAPHIC COLUMNS FOR TEACHING

Rodrigo Amorim Motta Carvalho, Alexsander Tressino de Carvalho, Esteban Fachini, Maria Lúcia Pereira da Silva

THE LIFELONG EDUCATION – A SOCIAL TREND OR COMPETENCE NEED

Hong Wu, Pierre-Olivier Lombarteix

#### **SESSION W2A - NEW APPROACHES AND TOOLS – Virtual Laboratories (II)**

A VIRTUAL PLATFORM TO TEACH CHEMICAL PROCESSES

Maria da Graça Rasteiro, L. Ferreira, J. Teixeira, F.P. Bernardo, M.G. Carvalho

EVALUATING FERMOPT AS A TOOL FOR TEACHING FERMENTATION AND OPTIMIZATION PRINCIPLES

Mark Lay, Janis Swan

TEACHING HEAT TRANSFER TO ENGINEERING STUDENTS — A COURSE OF COMPUTER-BASED HANDS-ON ACTIVITIES

Colm O'Sullivan

FEASIBILITY STUDY: USING A VIRTUAL SURVEYING INSTRUMENT IN SURVEYOR TRAINING

Hui-Lung Kuo, Shih-Chung Kang, Cho-Chien Lu, Shang-Hsieh Hsieh, Yong-Huang Lin

DEVELOPMENT AND INTERACTION OF WEB LABS AND LMS

Manuel Castro, Elio Sancristobal, Sergio Martin, Gabriel Diaz, Juan Peire

#### **SESSION W2B - NEW APPROACHES AND TOOLS – Virtual Laboratories (III)**

A PARADIGM FOR VERTICALLY INTEGRATED CURRICULUM INNOVATION - HOW CURRICULA WERE DEVELOPED FOR UNDERGRADUATE, MIDDLE AND HIGH SCHOOL STUDENTS USING UNDERWATER ROBOTICS

Liesl Hotaling, Rustam Stolkin, Elizabeth McGrath, Costas Chassapis, Keith Sheppard

A LABORATORY SUPPORT FRAMEWORK BASED ON A NETWORKED KNOWLEDGE REPRESENTATION

Cédric Boey, Vincent Raman, Marc Jaumain, Frédéric Robert

SHOULD ENGINEERING FRESHMEN HAVE AN ENGINEERING LABORATORY IN THE FIRST SEMESTER?

Klaus Wuersig

ENGINEERING EDUCATION USING A LONG-DISTANCE-CONTROLLED ROBOT SYSTEM TO ENHANCE STUDENTS' MOTIVATION

Akiyuki Minamide, Kazuya Takemata, Nobuyuki Naoe, Hirofumi Yamada, Suat Hoon Pee

AN ONLINE TOOL FOR TEACHING DESIGN TRADE-OFFS IN COMPUTER ARCHITECTURE

Azam Beg

#### **SESSION W2C - NEW APPROACHES AND TOOLS – Problem Based Study Projects (I)**

PROJECT-BASED LEARNING IN FIRST YEAR ENGINEERING CURRICULA: COURSE DEVELOPMENT AND LEARNING EXPERIENCES IN TWO NEW COURSES AT MIT

Monica Rush, Dava Newman, David Wallace

USING GAMES IN LECTURES TO IMPROVE STUDENT LEARNING

John Anthony Rossiter

MOTIVATING STUDENTS USING IN-CLASS QUESTION SESSIONS

Elizabeth Laws

THE RELEVANT FACTORS IN THE TEACHING–LEARNING PROCESS OF DESIGN OF EXPERIMENTS

Juan Sillero, Esa Rocio Balmori

ADOPTING PROBLEM-BASED LEARNING IN THE TEACHING OF ENGINEERING UNDERGRADUATES: A MALAYSIAN EXPERIENCE

Berhannudin Mohd Salleh, Hussain Othman, Ahmad Esa, Abdullah Sulaiman, Hasyamudin Othman

**W2D - NEW APPROACHES AND TOOLS – Problem Based Study Projects (II)**

EXPERIENCE WITH PRACTICAL PROJECT BASED LEARNING IN A DEVELOPING UNDERGRADUATE ENGINEERING DEGREE PROGRAM

Tim Anderson, Rob Torrens, Mark Lay, Mike Duke

MODEL FOR ENGINEERING EDUCATION TO DEVELOPMENT OF COMPETENCES AND ABILITIES

Gilson Morales, Clarissa Unica Morales

A SYNTHESIS COURSE OF PROJECT-BASED AND KNOWLEDGE-BASED IN ENGINEERING PROGRAMM

Chen Xu, Ang Haisong, Tong Mingbo

THE STUDY OF "FREE-RIDER" IN PROBLEM-BASED LEARNING SITUATION

Hui-Chin Huang, Yu-Tsen Kuo, Shang-Tsung Yang

ALTERNATIVE AND AUGMENTATIVE COMMUNICATION AS UNDERGRADUATE ENGINEERING PROJECTS

Anil Prabhakar, Namita Jacob

**SESSION W2E - NEW APPROACHES AND TOOLS – Problem Based Study Projects (III)**

THE ANALYSIS OF PROBLEM LEVEL AND KNOWLEDGE CATEGORY IN PROBLEM-BASED PEDAGOGY APPLIED TO DESIGN EDUCATION □ TO TAKE OFFICE DESIGN AS AN EXAMPLE

Shau-Thou Yang, Yu-Ting Lin, Yi-Xin Zhang

THE CURRICULUM DESIGN AND IMPLEMENTATION OF PROBLEM-BASED LEARNING IN GRAPHIC COMMUNICATIONS

Tsu-Ming Wu, Jon-Chao Hong, Shin Liao, Li-Ting Chen

WHAT ARE THE PERCEPTIONS OF CIVIL ENGINEERING LECTURERS TOWARDS USING COOPERATIVE LEARNING?

Aoife Ahern

BASIC CIRCUITS ANALYSIS LEARNING: A COIMBRA UNIVERSITY CASE STUDY IN THE ELECTRICAL AND COMPUTERS ENGINEERING DEPARTMENT

Pedro Faia

EXPERIMENTA@FEUP

Maria Teresa Restivo, José Couto Marques, Tito Vieira

**SESSION W2F - SPECIAL SESSION S1. E-Learning for Architectural Design, Product Design and Engineering Design (II)**

E LEARNING: SUPPORTING THE TRANSITION FROM SKILLS TO A KNOWLEDGE BASED LEARNING APPROACH TO DESIGN

David Heesom, Anthony Felton, Kevin Garner

E-LEARNING ENVIRONMENT OF BUILDING AUTOMATION

Matti Väänänen, Jussi Horelli, Jari Jussila, Juha Katajisto

ADAPTIVE MECHANISM IN VIRTUAL EDUCATION ENVIRONMENT

Marek Bober, Radoslav Fasuga, Jana Sarmanova

APPLICATION OF TAM MODEL ON E-LEARNING SYSTEM IN USING INTENTIONS AND AFFECTING FACTORS FOR LEARNERS

Kuei-Chih, KC Chuang

**SESSION W2G - SPECIAL SESSION S2. New Tech in Math for Engineering and other Sciences (II)**

STUDENT EVALUATION OF THE LEARNING MANAGEMENT SYSTEM FRONTER FROM AN HCI PERSPECTIVE

Frode Eika Sandnes, Hua-Li Jian, Simen Hagen, Olav Talberg

ENGLISH AS A LINGUA FRANCA: A TOOL FOR ENGINEERS

Jaana Suviniitty

UML BASED EMBEDDED DOCUMENTATION FOR SEMI-AUTOMATIC SOFTWARE DEVELOPMENT

Nenad Marovac



A PROBLEM BASED APPROACH TO OPTIMIZATION: APPLIED CASES, FROM BASIC CYCLES TO ENGINEERING EDUCATION

João Miranda, Casquilho Miguel

TRANSPORT MODELLING FOR IMPROVED ENVIRONMENT: ENGINEERING EDUCATION STUDIES OF ENVIRONMENTAL IMPACT AND CUSTOMERS ATTITUDE

James Uhomoibhi, Dailin Huang

**SESSION W2H - SPECIAL SESSION S12 – Technology and Society**

UNDERGRADUATE COURSE COLLABORATION BETWEEN INDUSTRIAL TECHNOLOGY AND COMPUTER INTEGRATED MANUFACTURING TECHNOLOGY AT PURDUE UNIVERSITY

Sorraya Khiewnavawongsa, Edie Schmidt

COOPERATIVE EDUCATION: THE KNOWLEDGE OF COMPETENCES

Patricia Lara dos Santos Matai, Shigueharu Matai

COOPERATIVE EDUCATION: THE PHYSICAL ENVIRONMENT

Patricia Lara dos Santos Matai, Shigueharu Matai

INCORPORATING PARTICIPATORY ACTION DESIGN INTO RESEARCH AND EDUCATION

Dan Ding, Rory Cooper

AN EMPIRICAL EMISSION ANALYSIS MODEL FOR HEBEI PROVINCIAL INDUSTRIES IN CHINA

Dezhi Liu, Hong Wu, Haibiao Cai

**PLENARY SESSION 3 - QUALITY, ACCREDITATION AND ENGINEERING EDUCATION FOR A NEW GENERATION**

Invited Speakers: António Salgado de Barros, Giuliano Augusti, Oleg Boev

**SESSION R1A - SPECIAL SESSION S2. New Tech in Math for Engineering and other Sciences (III)**

USING THE CONCEPT OF GOOGLE'S PAGERANK TO ENHANCE STUDENT MOTIVATION IN MATHEMATICS

Francisco Pedroche

E-LEARNING IN SPACE SCIENCES AND TECHNOLOGIES: "STATES OF ARTS AND DEVELOPMENT STRATEGIES" IN AFRICA

Souad Elharrassi, Abderrahmane Touzani, Samir Bennani

A SELF-PRACTICE ONLINE TOOL FOR TEACHING AND LEARNING COMPUTATIONAL SKILLS IN ENGINEERING CURRICULA

Abbas El-Zein, Tim Langrish, Nigel Balaam

MEANINGFUL LEARNING THROUGH IDENTIFYING DIFFERENCES AND SIMILARITIES BETWEEN CERTAIN PROBLEMS AND ALGORITHMS

Malik Jahan Khan, Ashraf Iqbal, Yasser Hashmi

MEANINGFUL LEARNING OF PROBLEM TRANSFORMATIONS FOR A GRID GRAPH

Munazzah Abdul Ghaffar, Ashraf Iqbal, Yasser Hashmi

**SESSION R1B- SPECIAL SESSION S5. Involving Engineering Schools and Universities in Technical and Scientific Education for School Outreach (II)**

HIGHER/SECONDARY EDUCATION: A SUCCESSFUL PARTNERSHIP

Celina Leão, Filomena Soares, José Machado, Eurico Seabra

A U.S. WORKING MODEL FOR THE K-16 ENGINEERING PIPELINE

Howard Kimmel, John Carpinelli, Rosa Cano, Angelo Perna

A PROPOSED MODEL CURRICULUM FOR PRE-ENGINEERING DEGREE PROGRAMS

Xin-Ran Duan

THE IMPACT ON UNIVERSITY STUDENTS PARTNERED WITH SECONDARY TEACHERS WHEN DEVELOPING AUTHENTIC LEARNING ACTIVITIES

Anant Kukreti, Daniel Oerther, Thaddeus Fowler, Suzanne Soled

AN INNOVATIVE K-12 SCIENCE AND ENGINEERING INITIATIVE

Joseph Cocozza

**SESSION R1C - SPECIAL SESSION S6 – Curriculum Development Adapting to Globalization**  
ENGINEERING PRACTICE: A DRIVER FOR CURRICULUM CHANGE

Vojislav Ilic

A NEW PARADIGM FOR UNDERSTANDING COMMUNICATION THAT CAN TRANSFORM ENGINEERING COMMUNICATIONS LEARNING AND TEACHING

Rick Evans, Jerry Gabriel

PROMOTING CULTURAL AWARENESS AND UNDERSTANDING IN ENGINEERING EDUCATION CURRICULUM

Yuko Hoshino, Wayne Sanders

INTEGRATION OF RESEARCH AND TEACHING IN ENGINEERING AND COMPUTER EDUCATION - RESEARCH PROJECTS AS A SOURCE FOR CURRICULUM

DEVELOPMENT IN RESPONSE TO GLOBALIZATION CHALLENGES

Clara Amelia de Oliveira, Maria do Socorro Marcia Lopes Souto

DEVELOPING THE CREATION EDUCATION OF THE INTEGRATION OF CURRICULUM ON THE LIVING CULTURE AND TECHNOLOGY IN NEW CENTURY

Kuei-Chih, KC Chuang

**SESSION R1D - SPECIAL SESSION S7 – Education and Research on Sustainability**

CYBERWORK IN ENERGY PLANNING AND SUSTAINABLE DEVELOPMENT

Ricardo Gimenes, Miguel Udaeta, André Gimenes, Aquiles Grimoni

E-LEARNING INSTRUCTION FOR THE IMPLEMENTATION OF A RENEWABLE ENERGY ENGINEERING PROFILE IN AN INTERNATIONAL PROJECT

Eduardo Montero, María Jesús González, Montserrat Díez, Ricardo Pizarro, Margarita Ortega

QUALITY SYSTEM FOR EXCELLENCE IN ENGINEERING EDUCATION

Shiena Shekhar, Arun Arora

TEACHING OF CLEAN ENERGY PRODUCTION IN THE SILESIA UNIVERSITY OF TECHNOLOGY IN GLIWICE, POLAND

Ryszard K. Wilk

**SESSION R1E - SPECIAL SESSION S8 – Humanitarian Engineering**

HUMANITARIAN ENGINEERING PROGRAM – CHALLENGES IN THE EXECUTION OF REMOTE PROJECTS

Catherine Skokan, David Munoz

ENGINEERS WITHOUT BORDERS – USA, LEARNING THROUGH HUMANITARIAN SERVICE TO UNDERDEVELOPED COMMUNITIES

Willard Nott, Peter Bosscher, Adam Christensen, Cathy Leslie, Doug Edwards

RENEWABLE ENERGY PROJECTS FOR TEACHING HUMANITARIAN ENGINEERING

Pritpal Singh

THE ROLE OF INTERNATIONAL PROJECTS IN ENGINEERING EDUCATION: BIOFUEL ELECTRIFICATION IN ORISSA, INDIA

Maren Somers, Stephanie Bogle, T. Patrick Walsh, Benjamin Barnes, Sean Poust

UNIVERSITY, SOCIETY AND NON-PROFIT ORGANIZATIONS: THE DEVELOPMENT OF A PARTNERSHIP

Samuel Toffoli, Silvio Burratino Melhado, Maria Inês Piffer, Tereza Carvalho

**SESSION R1F - SPECIAL SESSION S9 – Innovation and Entrepreneurship in Engineering Education**

ENTREPRENEURSHIP IN BIOMEDICAL ENGINEERING, FROM CLASSROOM TO CORPORATION: A MODEL AND CASE STUDY

Vikki Hazelwood, Arthur Ritter, Helena Wisniewski

THE GENERATOR II PROJECT - AN INTERNATIONAL ENTREPRENEURSHIP COLLABORATION BASED ON THE VENTURE CUP CONTEST AND FINANCED BY THE EUROPEAN UNION INTERREG PROGRAM

Bjørn Gitle Hauge

SOCIAL CAPITAL FOR ENTREPRENEURS

Celso Massatoshi Furukawa, Jose Antonio Lerosa de Siqueira

TEAMWORK AND INNOVATION COMPETENCIES: A FIRST SEMESTER ENGINEERING STUDENTS HANDS-ON COURSE

Maria Catalina Ramirez, Nestor Alexander Jimenez, Jose Tiberio Hernandez

A STUDY ON THE TALENTS' COMPETENCY AND THE NEED AND IMPLEMENT OF EDUCATING AND TRAINING AT THE MANUFACTURERS IN TAIWAN

Ming-Ta Wu, Yu-Shan Cheng, Pei-Wen Liao

**SESSION R1G - SPECIAL SESSION 15 – Assessment of Research and Education (I)**

**THE EXCELLENCE SYSTEM APPLICATION IN HIGHER EDUCATION**

Radim Farana

ANALYSIS OF ACADEMIC PAPERS IN THE FIELD OF MATERIAL SCIENCE AMONG UNIVERSITIES AND COLLEGES IN TAIWAN, HONG KONG, SINGAPORE, AND CHINA

Mu-Hsuan Huang, Pei-Shan Chi

SW3A: WEB-BASED SYSTEM FOR ACADEMIC ASSESSMENT AND FOLLOW-UP

José Celso Freire Junior, Edson Luiz França Senne, Galeno José de Sena

ON ADDRESSING THE VARIATION IN INTELLECTUAL DEMAND OF ENGINEERING UNDERGRADUATE RESEARCH PROJECTS

Andrew Kilpatrick, Joe Petrolito, Katherine Legge, Daniela Ionescu

EVALUATION OF ENGINEERING EDUCATION: A CASE OF STUDY BASED ON THE EXPERIENCE OF THE POLYTECHNIC SCHOOL OF THE UNIVERSITY OF SÃO PAULO

Giuliano Olguin, Henrique Gaspar, Ana Cecília dos Santos, Haydeé Svab, Clarice Aiello

**SESSION R2A - REDISCOVERING THE FOUNDATIONS – Biology and Biotechnology**

**WHY ENGINEERING BIOLOGY MATTERS**

Wee Ling W

BIONICS IN ENGINEERING - DEFINING NEW GOALS IN ENGINEERING EDUCATION

Ralf Neurohr, Cristian-George Dragomirescu

UTILIZATION OF BIOMASS AND MIXTURES FOR THE GAS PRODUCTION

Dagmar Juchelková, Tomasz Wiltowski, Vaclav Roubicek

A COMPREHENSIVE REVISION OF THE INDUSTRIAL BIOTECHNOLOGY

UNDERGRADUATE PROGRAM IN RESPONSE TO ESTABLISH A BIO-BASED ECONOMY

Rosa Buxeda, Lorenzo Saliceti-Piazza

BIOMEDICAL ENGINEERING UNDERGRADUATE COURSES

Jose Carlos Moraes

**SESSION R2B - REDISCOVERING THE FOUNDATIONS – Design**

EDUCATION OF SPATIAL THINKING AND AESTHETICS - TOWARD HUMANISATION OF BUILT SPACE

Lidia Zakowska

DESIGN AND PRODUCTION ENGINEERING. SOME MOVING FRONTIERS OF THE ENGINEERING EDUCATION IN BRAZIL

Beany Monteiro, Roberto Bartholo

DISTRIBUTED EXPERTISE AND AUTHENTICITY IN THE DEVELOPMENT OF DESIGN EXPERTISE

Vanessa Svihla, Anthony Petrosino, Kenneth Diller, Taylor Martin

DESIGN EDUCATION IN BRAZIL

Regina Celia de Souza Pereira, Ricardo Manfredi Naveiro

**SESSION R2C - NEW APPROACHES AND TOOLS – e-Learning (III)**

A BLENDED LEARNING APPROACH TO TEACHING FIRST YEAR ENGINEERING DEGREE STUDENTS

Peter Bullen, Mark Russell

VIRTUAL LEARNING APPROACH IN VOCATIONAL INITIAL TEACHER TRAINING

Peter Toth

IMPLEMENTING ADVANCED E-LEARNING FACILITIES. CASE STUDY FOR BABES-BOLYAI UNIVERSITY, CLUJ-NAPOCA, ROMANIA

Alina Andreica

E-LEARNING PLATFORM FOR TEACHING COURSES OF DYNAMICS AND FLUID MECHANICS BY X3D

J. F. Tsai, J. S. Kouh, C.W. Chen

NEW APPROACH TO DISTANCE LEARNING WITH USING OF GRID-COMPUTING

Olga Dolinina, Dmitry Kintsel

**SESSION R2D - THE CHALLENGES OF RESEARCH – Student Integration in Research Projects**

ENGAGING UNDERGRADUATE STUDENTS IN RESEARCH PROJECTS

Maria da Graça Rasteiro

NSF CENTERS' APPROACH TO THE INTEGRATION OF RESEARCH AND EDUCATION

Anne Donnelly

EDUCATION ACROSS LENGTHSCALES

Graham Harrison, Christopher Cox, Gary Lickfield, Amod Ogale

STUDENTS RESEARCH TRAINING AND CURRICULUM DEVELOPMENT THROUGH SCIENTIFIC RESEARCH

Mia Eeckhout, Filip Van Bockstaele

RESEARCH EXPERIENCES FOR UNDERGRADUATE STUDENTS IN STRUCTURAL ENGINEERING

Anant Kukreti

**SESSION R2E - NEW APPROACHES AND TOOLS – Laboratory Integration (I)**

DESIGN AND DEVELOPMENT OF A HYDRAULIC CIRCUIT BENCH FOR EDUCATION PURPOSES

Abd almotlab Kheirallaa, Omer Adam Rahamab, Dina Mahmoud Abd-lkareemb, A.bu baker

Adam Saadelnoorb, Ghada Mustafa Nasrb

EXPERIMENTAL MODULES CONSTRUCTION: AN IMPORTANT METHODOLOGY TO PREPARE FUTURE ENGINEERS

Paulo Roberto Alves Pereira, Fabio Henrique Salvalaio, Mauro de Paula Moreira, Adão da Silva

DESIGN AND DEVELOPMENT OF A PNEUMATIC CIRCUIT BENCH FOR EDUCATION PURPOSES

Abd Almotaleb Kheiralla, Mohamed Abdel-Monaemb Abdel-Monaemb, Mohamed Ibrahim

Ahmed Ahmed

THE ESTABLISHMENT OF AN INTERACTIVE E-LEARNING SYSTEM FOR ENGINEERING FLUID FLOW AND HEAT

Tzu-Chen Hung, Chun-Chieh Liu, Chih-Tzung Hung, Hao Ku

VISUALIZATION OF CATALYZED COMBUSTION ZONE BY TIME-RESOLVED INFRARED THERMOGRAPHY

Rafael M. Digilov

**SESSION R2F - NEW APPROACHES AND TOOLS – Laboratory Integration (II)**

LEARNING AUTOMATION BY DOING IT – A CASE-STUDY

Pedro Silva, Paulo Oliveira, Nuno Carvalho, Celina P. Leão, Filomena Soares

A LABVIEW APPLICATION IN A MINI POWER SYSTEM MODEL ALLOWING REMOTE ACCESS

José Grimoni, Vinicius Lopes, Osvaldo Nakao

SENSORS AS AN ALTERNATIVE WAY FOR TEACHING EMBEDDED SYSTEMS AND MICROELECTRONICS

Thiago de Faria, Wesley Becari, Javier Ramirez-Fernandez

VIRTUAL LABORATORY OF MICROELECTRONIC MOUNTING AND PACKAGING TECHNOLOGIES

Cyril Vasko, Marek Novotny, Ivan Szendiuch

VIRTUAL NANOTECHNOLOGY WORKBENCH FOR ENGINEERING EDUCATION

Ante Munjiza

**SESSION R2G - SPECIAL SESSION S4. Multidisciplinary/Institutional Senior Design (I)**

MATERIALS, MARKETING AND THE ENVIRONMENT - AN INTERDISCIPLINARY APPROACH FOR STUDENTS

Dale Palmgren

MQP IN CHINA: DOING PROJECTS AND BEYOND

Yiming Rong, Gretar Tryggvason, Richard Vaz, Liang Gao, Changlin Wu

PRACTITIONER DRIVEN SENIOR DESIGN CAPSTONE COURSE

Anant Kukreti, Raviteja Chalasani

CAPSTONE DESIGN PROJECT ON OPTICAL MEMS: A VEHICLE FOR INTERDISCIPLINARY RESEARCH AND LEARNING

Eniko Enikov, Stanley Pau

MEANINGFUL LEARNING AT THE INTERFACE OF COMPUTING AND MOLECULAR BIOLOGY

Ashraf Iqbal, Yasser Hashmi, Muhammad Aurangzeb  
INTERDISCIPLINARY ASPECTS IN MICRO(NANO)ELECTRONICS TECHNOLOGY EDUCATION

Ivan Szendiuch, Cyril Vaško .

**SESSION R2H - SPECIAL SESSION S5. Involving Engineering Schools and Universities in Technical and Scientific Education for School Outreach (III)**

AN ASSESSMENT OF A HIGH SCHOOL BME ENGINEERING OUTREACH PROGRAM

Anna Koo, Melora Sundt, Joe Cocozza

AN INTEGRATED STEM RESEARCH AND PROFESSIONAL DEVELOPMENT PROJECT FOR TEACHERS

Anant Kukreti, George Sorial, Mingming Lu, Heng Wei, Thaddeus Fowler  
NAVIGATING THE OBSTACLES IN SCIENCE EDUCATION FOR SCHOOL OUTREACH

Diana Rincon, Dawn Elliott

USING AN EXPECTED LOSS FUNCTION TO IDENTIFY BEST HIGH SCHOOLS FOR RECRUITMENT

Sonia Bartolomei-Suárez, David González-Barreto, Antonio González-Quevedo  
INTEGRATION OF RESEARCH AND EDUCATION IN A MULTI-INSTITUTIONAL CENTER

Elizabeth Tranter

“SPAZIO PER TUTTI”: A HANDS-ON EXPERIENCE TOWARD SPACE ENGINEERING

Amalia Finzi, Marco Molina

**SESSION R3A - WHAT DEGREES FOR WHAT JOBS? – Assessment of Engineering Education (III)**

REENGINEERING CHEMICAL ENGINEERING EDUCATION FOR THE FUTURE

Pedro Saraiva, Lino Santos, Rosa Quinta-Ferreira

COMPARING CHALLENGE-BASED AND TRADITIONAL INSTRUCTION IN BIOMEDICAL ENGINEERING

Taylor Martin, Stephanie Rivale, Kenneth Diller

A STRATEGIC APPROACH TO INDUSTRIAL ENGINEERING CURRICULUM IN BRAZILIAN PRIVATE SCHOOLS

Santoro Miguel Cezar, Mesquita Marco Aurélio de

DEVELOPING MINING ENGINEERING FOR AFRICAN COUNTRIES - THE MOZAMBIQUE CASE STUDY

Peter Knottenbelt

A SURVEY OF COURSE ASSESSMENT AT “POLITEHNICA” UNIVERSITY OF BUCHAREST

Irina Postelnicu, Mihaela Albu

**SESSION R3B - WHAT DEGREES FOR WHAT JOBS? – Engineering Accreditation**

ACCREDITATION OF ENGINEERING EDUCATION FOR THE MASTER’S DEGREE IN TAIWAN

Mandy Liu, Pei-Fen Chang, Yeong-Bin Yang

EUR-ACE AND ENAEE: A PROPOSAL AND A TOOL FOR A EUROPEAN SYSTEM FOR ACCREDITATION OF ENGINEERING EDUCATION

Giuliano Augusti, Borri Claudio, Elisa Guberti

TITLE: CONTRIBUTIONS TO QUALITY ASSURANCE OF ENGINEERING EDUCATION IN ROMANIA

Dan-Maniu Duse, Carmen Sonia Duse

A NEW FRAMEWORK FOR MEASURING QUALITY IN ENGINEERING EDUCATION AND RESEARCH IN SLOVAK REPUBLIC

Tatiana Čorejová, Maria Rostášová, Matilda Drozdová

DEVELOPMENT OF AN EFFECTIVE LEARNING CURRICULUM FOR FE/EIT EXAMINATION

Uksun Kim, David Cheng, Othoniel Rodriguez-Jimenez, Ning Fang.

**SESSION R3C -SPECIAL SESSION S4. Multidisciplinary/Institutional Senior Design (II)**

ENGINEERING DESIGN PROCESS –AN INTERDISCIPLINARY APPROACH

Tanya Domina, Maureen MacGillivray, Terry Lerch, Patrick Kinnicutt

ENGINEERING EDUCATION SOLUTIONS TO A GLOBAL ECONOMY

Alexandru Mihail Morega, Juan Carlos Ordonez, Jose Viriato Coehlo Vargas, Cesar Luongo,  
Chiang Shih

ON CHALLENGES OF DESIGN-BASED CURRICULUM

Peter Bofah

ORGANISATIONAL ASPECTS OF THE EVICAB – A VIRTUAL EUROPEAN CAMPUS FOR  
BIOMEDICAL ENGINEERING

Jiri Jan

COMBINED BIOMEDICAL AND ECOLOGICAL ENGINEERING – INITIAL EXPERIENCE  
FROM REALISATION

Jiri Jan

**SESSION R3D - SPECIAL SESSION 15 – Assessment of Research and Education (II)**

MODELS FOR RESEARCH-BASED TEACHING IN ENGINEERING COURSES: A CASE-  
STUDY AT THE UNIVERSITY OF AVEIRO (PT) AND SAN JOSÉ STATE (USA)

Isabel Huet, Nikos Mourtos, Nilza Costa, Osvaldo Pacheco

TOWARDS A HELPING SYSTEM FOR A GOOD ASSESSMENT IN E-LEARNING

Nour-eddine El Faddouli, Mohammed Khalidi Idrissi, Fayssal Smawi, Youssef Belqasmi

LEARNER TRACKING: WHICH SYSTEM?

Mohammed Khalidi Idrissi, Nour-eddine El Faddouli, Nadia Nechchad, Samir Bennani

ASSESSMENT OF CURRENT ENGINEERING EDUCATION IN GREECE - UNIVERSITIES  
AND TECHNOLOGICAL INSTITUTES

Asterios Liolios, Anastasios Boglou

DEVELOPING PROCESS OF SPECIAL PROJECT COURSE AT DEPARTMENT OF  
MECHANICAL AND ELECTRO-MECHANICAL ENGINEERING OF NATIONAL I-LAN  
UNIVERSITY IN TAIWAN

Gwo-Chung Tsai

**SESSION R3E - SPECIAL SESSION 16 – Curriculum Development and Practical Placement (I)**

TWO COMPREHENSIVE U.S. STUDIES OF ENGINEERING EDUCATION REFORM

Ernest Smerdon, Jeffrey Russell

THE COMPARISON OF PROBLEM-BASED LEARNING (PMBL) MODEL AND PROJECT-  
BASED LEARNING (PTBL) MODEL

Jon-Chao Hong, Chan-Li Lin, Hui-Chin Huang

PRACTICAL CHALLENGES WITH A PBL IMPLEMENTATION IN ENGINEERING  
EDUCATION

Raija Tuohi, Janne Roslöf

WHY THE IDEA OF SPECIALIZATION OF UNIVERSITIES AND UNIVERSITY  
DEPARTMENTS SEEMS TO BE OUTDATED

Ali Amirfazli, Mohammad Hassan Saidi, M. Yaarahmadi

**SESSION R3F - SPECIAL SESSION S17 – Problem-Oriented Study Projects**

SOME RESULTS FROM MANAGING THE PROCESS OF GROUP FORMATION AND  
EVALUATION IN STUDENT PROJECTS

João Falcão e Cunha, José Luís Borges, Teresa Galvão

LEARNING ASPECTS OF PROCEDURES FOR SHIP CONCEPTUAL DESIGN BASED ON  
FIRST PRINCIPLES

Hernani Brinati, Mardel de Conti, Oscar Augusto

EVALUATION PROCESSES IN TUNE WITH NEW PERSONAL AND PROFESSIONAL  
PERSPECTIVES

Osvaldo Nakao, Hernani Brinati

CREATIVE USE OF SHAKE TABLE EXPERIMENTS FOR EDUCATION AND  
UNDERGRADUATE RESEARCH

Lisa Wang

A STUDY ON THE LEARNING ASSESSMENT OF A SANDWICH PROGRAM BASED ON  
CONSTRUCTIVISM

H.P. Feng, H.H Tsai, Y.R. Yang

**SESSION R3G - SPECIAL SESSION S18 – Engineering Education Policies and Practice - Theory  
and Case Studies**

OVERVIEW AND BRIEF ANALYSIS OF FINANCING OF INNOVATIVE ACTIVITIES AND  
RESEARCH IN RUSSIA

Yury Chebotarevsky

IMPROVING STUDENT RETENTION – A SEQUEL TO A RECENT UWS REVIEW

Graham Bishop, Vojislav Ilic

EXPERIENCES IN COOPERATIVE COMPUTER ENGINEERING COURSE AT THE  
UNIVERSITY OF SÃO PAULO – Brazil

Paulo Sérgio Cugnasca, João Batista Camargo Junior, Jorge Rady Almeida Junior  
RESEARCH INSTITUTIONALIZATION EFFORTS AT THE UNIVERSITY OF PUERTO  
RICO – MAYAGÜEZ

Yuri Rojas-Ramírez, David Suleiman-Rosado

PEDAGOGICAL COMPUTATIONAL ENVIRONMENT ABOUT THE BEHAVIOR AND  
DIMENSIONING OF COMPOSITE BEAMS

Maria Aparecida Costa, Walnório Ferreira, Rodrigo Camargo, Elisa Boina

**SESSION R3H - SPECIAL SESSION S19 – Increasing the Participation in Industry, Education  
and Research of Minorities and Women**

INCORPORATING ETHICS AND SOCIAL RESPONSIBILITY IN UNDERGRADUATE  
ENGINEERING EDUCATION

Jessica Tucker, David Ferguson

LINKING INTERNSHIP PROGRAMS AND SCHOLARSHIP DONATIONS: ASSESSING  
INDUSTRY REINVESTMENT IN ENGINEERING EDUCATION

Susan Haag, Trina Corbin

BEING A FEMALE ENGINEER STUDENT: LESSONS FROM THE INDUSTRIAL  
ENGINEERING

Celina P. Leão, Carina Pimentel, Cristina S. Rodrigues

"WHAT REALLY MATTERS?": A CRITICAL RESEARCH STUDY OF THE  
ORGANIZATIONAL AND PERSONAL FACTORS INFLUENCING UNDERREPRESENTED  
ENGINEERING STUDENTS' RETENTION

Sharoni Little, Donna Buchanan, Jermaine Upshaw, Melora Sundt

FOSTERING THE ENGINEERING EDUCATION OF WOMEN UNDERGRADUATES

Chiejina E. Ottah

**SESSION F1A - WHAT DEGREES FOR WHAT JOBS? – Entrepreneurship and Management**

LEVERAGING A RESEARCH CENTER OF EXCELLENCE TOWARDS THE EDUCATION  
OF ENGINEERING LEADERS

Michael Silevitch, Stephen McKnight, Mariah Nobrega

COOPERATIVE EDUCATION AS AN UNDERGRADUATE FEEDER INTO A GRADUATE  
LEVEL ENGINEERING LEADERSHIP PROGRAM

David Potter, Stephen McKnight, Michael Silevitch

THE STUDY OF SEMICONDUCTOR INDUSTRY MANAGER' MANAGEMENT  
COMPETENCY AND TRAINING AND DEVELOPMENT IN TAIWAN

Ming-Ta Wu, Pei-Wen Liao, Yu-Shan Cheng

E-NETWORK FOR INCUBATION AND INNOVATION

Juan Villalvazo-Naranjo, Fernando Aldrete-Lozano, Luis-Enrique Montes-Haro

AUTOMATION OF ORGANIZATIONAL MANAGEMENT OF THE TECHNICAL HIGHER  
EDUCATION INSTITUTE'S FACULTY ON THE BASIS OF BALANCED SCORECARD

Alexander Bolshakov, Olga Dolinina, Kirill Zolotko

**SESSION F1B - NEW APPROACHES AND TOOLS – Learning Computer Programming**

LEARNING TO PROGRAM - DIFFICULTIES AND SOLUTIONS

Anabela Gomes, António José Mendes  
PROPOSAL FOR A MULTILANGUAGE TEACHING PROGRAMMING ENVIRONMENT  
Rafael Fontao, Gustavo Goñi, Guillermo Kalocai, Gustavo Ramoscelli  
THE IMPACT OF LEARNING STYLES IN INTRODUCTORY PROGRAMMING LEARNING  
Lilian Carmo, Maria José Marcelino, António José Mendes  
LEARNING STYLES IN AN E-LEARNING TOOL  
Anabela Gomes, Álvaro Santos, Lílian Carmo, António José Mendes  
LEARNING TO PROGRAM WITH PROGUIDE  
Cristiana Areias, António Mendes, Anabela Gomes

**SESSION F1C - NEW APPROACHES AND TOOLS – Electrical, Electronics and Control Engineering**

REMOTE PROCESS CONTROL AND MONITORING USING MATLAB  
Martin Sysel, Ivan Pomykacz  
INTERACTIVE EDUCATIONAL SOFTWARE FOR DYNAMIC SYSTEMS CONTROL  
José Luis Lima, José Carvalho Gonçalves, Paulo Gomes Costa, António Paulo Moreira  
PLC TRAINING BASED ON A 3D VIRTUAL MAQUETTE CONTROL: AN EDUCATIONAL EXPERIENCE IN Automation  
José Luis Lima, José Carvalho Gonçalves  
ROLE OF PSPICE IN THE ENGINEERING TEACHING ENVIRONMENT  
Paul Tobin  
COOPERATIVE LEARNING STRATEGY IN THE IMPROVEMENT OF AN ELECTRICAL POWER SYSTEM COURSE  
Manuel Travassos Valdez, Cristina Faustino Agreira, Carlos Machado Ferreira, Fernando Maciel Barbosa

**SESSION F1D - REDISCOVERING THE FOUNDATIONS – Physics**

CURRICULUM INTEGRATION IN THE TEACHING OF PHYSICS TO FIRST YEAR ENGINEERING STUDENTS  
Paulo Coelho de Oliveira, Francislé Neri de Souza, Nilza Costa, Cristina Gaspar de Oliveira  
INTRODUCTORY PHYSICS COURSE FOR CIVIL ENGINEERING STUDENTS: A CURRICULAR PROPOSAL BASED ON PHYSICS EDUCATION RESEARCH  
Filipe Amaral, João Carvalho, Helena Caldeira  
THE QUALITY OF PHYSICS TEACHING IN ENGINEERING COURSES IN THE BOLOGNATRANSITION PERIOD: UNIVERSITY TEACHER'S CONCEPTIONS  
Cristina Gaspar de Oliveira, Nilza Costa, Francislé Neri de Souza, Paulo Coelho de Oliveira  
INVOLVING STUDENTS TO INDUSTRIAL PROJECTS  
Andrzej Szlek  
REAL WORK IN PHYSICS CLASSROOM: IMPROVING ENGINEERS STUDENTS COMPETENCES  
Clara Viegas, Bernardino Lopes, José Paulo Cravino

**SESSION F1E - REDISCOVERING THE FOUNDATIONS – Physics**

A PREDICTIVE MODEL OF CHLORINATION BY-PRODUCTS FORMATION IN THE OZONATION/CHLORINATION PROCESSES  
E-E Chang, Pen-Chi Chiang, I-Shu Li  
STABILITY, DISPLACEMENT AND MODERATION OF CHEMICAL EQUILIBRIUM: REDISCOVERING LE CHATELIER'S PRINCIPLE  
Claudio Olivera-Fuentes, Coray M. Colina  
CHEMICAL PRODUCT ENGINEERING AND DESIGN: ACTIVE LEARNING THROUGH THE USE OF CASE STUDIES  
Fernando P. Bernardo, Raquel Costa, Pedro M. Saraiva, Geoff D. Moggridge  
FOUNDRY PROPERTIES OF BACKING SAND: SOME ENGINEERING STUDIES AND IMPROVEMENTS  
P.A.O. Adegbuyi1, J.O. Uhomoihi

**SESSION F1F - NEW APPROACHES AND TOOLS – e-Learning (IV)**

FIXED-BED REACTOR MODELLING AND SIMULATION WITH E-LEARNING TOOLS



Margarida J. Quina, A.Cristina Almeida-Costa, Rosa M. Quinta-Ferreira  
"BIG BANG" IN THE UNDERGRADUATE CHEMISTRY CURRICULLUM VIA SYMBOLIC  
COMPUTATION

Mihai Scarlete, Starr Dostie, Benjamin Vail, Gavin Heverly-Coulson, Amber Findleton  
ED-WAVE: AN EDUCATIONAL SOFTWARE FOR TRAINING ON WASTEWATER  
TECHNOLOGIES USING VIRTUAL APPLICATION SITES

Evan Diamadopoulos, Panagiota Paraskeva, Malini Balakrishnan, Vidya Batra, Andrzej  
Kraslawski  
COMPUTATIONAL TOOLS FOR TEACHING GRADUATE COURSES IN GEOTECHNICAL  
ENGINEERING

Teresa Santana, Lamas Pedro  
VISUAL SIMULATION OF CONSTRUCTION ACTIVITIES: DIDACTIC VIRTUAL MODELS  
Alcnia Zita Sampaio, Pedro Gameiro Henriques

#### **SESSION F1G - NEW APPROACHES AND TOOLS – e-Learning (V)**

AUTOMATIC GENERATION OF PARAMETRIC DRAWINGS USING DXF AND VISUAL  
BASIC

Sampaio Alcnia Zita, Antonio Costa  
THE USE OF FREEWARE IN THE THEACHING OF ENGINEERING DESING GRAPHICS

Liang-Yee Cheng, Carolina Chaves Barbosa  
THE USE OF INTERNET IN ENGINEERING EDUCATION IN BRAZIL

Elizabeth Marques, Carlos Augusto Oliveira  
"VIRTUAL ASSEMBLY" - A WEB-BASED STUDENT LEARNING TOOL FOR  
THERMODYNAMICS CONCEPTS RELATED TO MULTISTAGING IN COMPRESSORS  
AND TURBINES

Sushil Chaturvedi, Tarek Abdel-Salam, Omkar Kasinadhuni  
INTRODUCING SHEET METAL DESIGN AND MANUFACTURING USING CATIAV5 AND  
CNC EQUIPMENT IN AN AIRCRAFT MATERIALS COURSE

Ronald Sterkenburg, Ronald Sterkenburg

#### **SESSION F1H - SPECIAL SESSION 16 – Curriculum Development and Practical Placement (II)**

PRACTICUM IN ENGINEERING CLASSROOM- A GRADUATE COURSE

Vinod Lohani, Hayden Griffin, Jenny Lo  
A CASE STUDY ON THE PATH FROM ACADEMIC PRACTICES TO  
COMMERCIALIZATION IN STUDENT PROJECTS

Gunnar Andersson, Sissel Larsen, Frode Aamodt  
TOWARDS THE DESIGN OF THE PROFESIONAL PROFILES IN AN INDUSTRIAL  
ENGINEERING CURRICULUM

Nstor Jimnez, Roberto Zarama, Catalina Ramrez, Pinzn Luis  
FIND LEARN STRATEGIES USING MULTIPLES INTELIGENCES: CASE STUDY IN A  
DISCIPLINE AT ESCOLA POLITCNICA UNIVERSITY OF SAO PAULO

Sergio Brandi

#### **PLENARY SESSION 4 - THE FUTURE OF COMPUTING – UTILITY COMPUTING AND THE IMPACT ON ENGINEERING EDUCATION**

Invited Speaker: Michel Benard

#### **CLOSING SESSION**