

# RESEARCH NEWSLETTER

July, 2007

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## FOREWORD

This second issue of the University Research Newsletter for the academic year 2006-2007 provides up-to-date information about the research and other scholarly activities undertaken by the University faculty members for the half year period from January 2007 to June 2007. A healthy research program has the advantage of attracting the best faculty and students. The scope of research support has been expanded in response to global technological challenges and in order to support and sustain diverse faculty research interests. Our goals are to promote creativity; to address critical, scientific, technological and managerial issues; encourage research in areas of national significance; and to improve the quality of graduate education. This *Research Newsletter*, published by Deanship of Scientific Research on a semi-annual basis, provides an overview of our faculty's research output, as well as the funding which the University provides its faculty to pursue research and scholarship. In particular, the *Research Newsletter* reports on faculty publications, conference presentations, funded projects, and many other features.

The Deanship of Scientific Research is making its best efforts in promoting the new research grants among the faculty members so that the faculty members can actively participate in the research which is not only beneficial to their own professional career but also to the development of the society at large.

Our sincere appreciation is due to Mr. R. Jayaraman for compiling this edition of the Research Newsletter.

**Dr. Mohammad S. Al-Homoud**  
**Dean of Scientific Research**

**2.        ABSTRACTS OF SOME OF THE RESEARCH PROJECTS RECENTLY**  
**APPROVED FOR FUNDING**

**1. Project No. EE/Spatial/342        Principal Investigator: Dr. Tareq Y. Al-Naffouri**

**Title: The Effect of Spatial Correlation on the Capacity of Multi-Input Multi-Output Broadcast Channels with Partial Side Information**

**Abstract**

This project considers the effect of spatial correlation on the system capacity of multi-access broadcast channel. One example of this system is the cellular system in which a base station with multiple antennas transmits to many users. The project quantifies the scaling laws (how capacity behaves in the presence of large number of users) for various multi-access broadcast schemes and how spatial correlation among the transmit antennas affects the system capacity. The schemes considered include the dirty paper coding, which requires feeding back the channel state information to the transmitter (i.e. to the base station) and random beam-forming, which requires only SINR (signal to interference and noise ratio) feedback to the transmitter. As an important by product, the project suggests a unique method for evaluating the probability density function for the sum of squares of correlated Gaussian random variables, which has important applications in many problems in communications and signal processing.

**2. Project No. ARE/Concrete/343        Principal Investigator: Dr. Hamoud Dehwah**  
**Co-I1: Dr. Mohd. Maslehuddin**  
**Co-I2: Dr. Omar B. Al-Amoudi**

**Title: Optimization of Mix Design and Durability of Self-Compacted Concrete**

**ABSTRACT**

Self-compacting concrete (SCC) is a special type of concrete that is able to compact itself by its own weight without vibration. It was first developed in Japan in 1988. It has been used in different countries and utilized for various types of concrete structures. However, its use has been limited in the Arabian Gulf due to the lack of research data in this region. Therefore, there is a need to conduct a full-scale study to develop a more rational mix design incorporating local aggregates and a low cost filler, such as limestone.

The objective of this research is to develop an optimum mix design for SCC utilizing the local aggregates and low cost filler, such as limestone, and to evaluate the mechanical properties and durability characteristics of the developed SCC. Based on the data developed in this study the life cycle cost of the developed SCC would be evaluated and compared with the normal concrete. It is expected that the data developed in the proposed study would contribute to the utilization of SCC by the local construction industry.

**3. Project No. CY/Zeolite/344      Principal Investigator: Dr. Mohammad Al-Daous**

**Title: Growth of Uniform Zeolite Layers on 3D Ordered Macroporous Synthetic Carbon: Synthesis, Characterization and Catalytic Evaluation**

**Abstract**

In this study the synthesis of a hybrid catalyst composed of three-dimensionally ordered macroporous anion-modified zirconia coated with a hydrothermally grown layer of zeolite is proposed. The successful synthesis of such a catalyst will be followed by various physicochemical methods such as scanning electron microscopy, solid-state  $^{27}\text{Al}$ -NMR, powder X-ray diffraction, surface area measurement, and elemental analysis of the solid catalyst. The catalyst will then be subjected to test reactions involving large guest molecules, specifically the degradation reaction of high density polyethylene (HDPE). The structure of the proposed system is expected to provide greater access to the large external surface area of acidic zeolite, thereby increasing the rate of the initial and limiting step encountered in the cracking of large polymer molecules. In addition, upon further cracking in the interior active centers of the zeolite, the product is expected to subsequently isomerize on the strongly isomerizing surface of the anion-modified zirconia. Moreover, the large macropores are expected to lead to the reduction in the contact time between the catalyst and the organic substrate, which could probably reduce the rate of deactivation of the external surface of the catalyst by coke; the formation of which could be the result of over-cracking of the hydrocarbon reaction-intermediates on the surface of the catalyst.

**4. Project No. EE/Microwave/345      Principal Investigator: Dr. Shaikh Sharif Iqbal  
Co-11: Dr. Saad Al-Shahrani**

**Title: Design of Active 24-GHz Micro strip Linear Phased Array-Antenna for Microwave Sensors**

**Abstract**

Microwave sensors are well suited for robust non-contact radars to measure distance and velocity. This class of sensors typically consists of an array-antenna module and a digital-signal-processor module. Although most of today's industrial sensors operate at 5.8 or 10 GHz and automotive sensors operate at 77 GHz, recently FCC (federal communications commission) and SARA (short range automotive radar frequency allocation) group decided to adopt 24-GHz technology for its next generation of short-range microwave sensors.

Active array-antenna modules, located in the front-end of the microwave-sensor, are often used to enhance the performance of the device. In this project, a 24-GHz microstrip linear phased array antenna with beam-scanning and signal-amplification properties will be designed. Professional software's will be used to simulate, analyze and optimize the active antenna-array module. Low cost packaging techniques for the 24-GHz microwave antenna array will also be envisaged.

In Saudi Arabia, this class of antennas has potential application in the process-control-

mechanism used in petrochemical industries, to monitor the petroleum and water ration within the transporting pipelines and the storages dumps.

**5. Project No. PH/Glasses/346      Principal Investigator: Dr. G.D. Khattak  
Co-I1: Dr. A. Mekki**

**Title: Direct Current Conductivity Studies of Strontium-Borate Vanadate Glasses**

**Abstract**

Direct current (DC) electrical conductivity studies are proposed to be carried out, in a continuation of our previous work “X-ray Photoelectron Spectroscopy (XPS) and Magnetization Studies of Strontium-Borate Vanadate Glasses” in an attempt to understand the nature of the mechanism governing the DC conductivity and the effect of addition of  $V_2O_5$  on the electrical properties in these glasses. This research will include fabrication of these glasses and the actual compositions of the grown glasses will be determined by inductively coupled plasma spectroscopy (ICP). These types of glasses exhibit mixed electronic (via electrons hopping along  $V^{4+}$ -O-  $V^{5+}$  paths) and ionic (via  $Sr^{2+}$  ions) conductivity and glasses with such mixed electrical conductivity attract scientific interest because they are of both academic and commercial potential applications. It has been reported that  $V_2O_5$ - $B_2O_3$  glasses containing mono-valent cations like  $Li^+$  and/or  $Ag^+$  have applications as solid electrolytes in electrochemical devices such as batteries, chemical sensors and smart windows. The goal of the project is to develop a correlation between the composition, structure and DC conductivity of these glasses. Further, DC conductivity studies will indicate whether  $V_2O_5$  enters the structure as a glass former or plays the role of a network modifier instead of network former.

Three systems of glasses,  $[(V_2O_5)_x (SrO)_{1-x}]$ ,  $[(V_2O_5)_{0.5}(SrO)_{0.5-y}(B_2O_3)_y]$  and  $[V_2O_5]_x(SrO)_{0.2}(B_2O_3)_{0.8-x}$ , will be considered to investigate the concentration dependent contributions of the different constituents of these glasses and this work is expected to produce experimental data that will help understand further the mechanism of the electrical properties in these glasses..

For measuring DC conductivity, disc-shaped samples will be made, polished and then the evaporation of gold electrodes on polished surfaces will be carried out in vacuum. Measurements of DC conductivity as a function of temperature, in all the samples, will be made by four probe technique. A constant voltage will be applied and the current will be measured in a temperature range 293 – 473 K. To obtain the variation of conductivity with temperature, the sample will be placed in a furnace, brought to the desired temperature and maintained at that temperature for sufficient time before taking the measurements to ensure thermal stability. The temperature will be measured by a Pt/Pt-10% Rh thermocouple. From the conductivity versus temperature data the values of different parameters will be obtained as explained.

**6. Project No. Che/Metallocene/347**

**Principal Investigator: Dr. Ibnelwaleed Hussein  
Co-I1: Dr. Basel Abu Sharkh  
Consultant: Dr. Joao B.p. Soares, Canada**

**Title: Synthesis, Solution, Melt and Solid State Properties and Modeling of Metallocene Polyolefins with Controlled Long Chain Branching**

**Abstract**

In Phase I of this research proposal, ~ 36 model polyethylene (PE) resins will be synthesized. The long chain branching (LCB) frequency and architecture will be systematically varied by using different metallocene catalyst types and polymerization approaches. Such a set of well-controlled branched model polymers, not available industrially, will be used to establish clear relationships between polymer structure, processing and solid-state properties. These polymers will be synthesized and fully characterized by CRYSTAF, TREF, NMR and GPC techniques. Professor Soares of the University of Waterloo, Canada will synthesize and characterize these polymers. Different melt and solid-state rheological analyses, thermal characterization, mechanical, light scattering and molecular simulation studies will be performed at KFUPM.

The light scattering experiments aim at determining the influence of LCB on the radius of gyration. Also, molecular simulations will be used to study the effect of LCB on the melt and solid-state morphology. The melt rheology part aims at correlating the type and frequency of LCB in polyolefins to the shear and extensional properties of polymers. Both dynamic and steady shear measurements as well as extensional properties will be measured in ARES rheometer. Rheology will be used to characterize the LCB and correlate LCB to rheology in the linear and nonlinear viscoelastic range. Also, the influence of LCB on flow activation energy will be assessed. The thermal analysis part will examine the influence of LCB on the melting and crystallization of m-PEs. Further, the impact of LCB on the mechanical properties of films of metallocene polyolefins will be measured. The knowledge acquired from the different characterization techniques will be used to produce resins with enhanced processing properties and novel applications. The project is expected to open the doors for scientific collaboration between the University of Waterloo, Canada and KFUPM. The project is expected to attract two MS students. The project duration is 2 years at a total cost of SR 418,000.

**7. Project No. Che/Refineries/348**

**Principal Investigator: Dr. Habib Al-Ali**

**Title: Cost Effective and Optimum Strategies for Emission Reduction in Refineries**

**Abstract**

In this proposed research work, a new model for air pollution control from refineries in Canada will be described. A decision support system will be developed that can select the best control strategy for refineries to achieve a given pollution reduction level. The originality of this proposal is that it will lead to the development of a unique decision support tool to determine strategies for pollution reduction in a refinery.

**8. Project No. Mgt/Hiring/349      Principal Investigator: Dr. Mansour Mourad**

**Title: Factors Influencing Employer Decisions in Hiring and Retaining Individuals with Disabilities in Selected Arab Countries**

**Abstract**

Employer decisions to hire and retain an employee can be influenced by a variety of factors. This study is intended to investigate the factors influencing the decisions made by employers to hire and retain individuals with disabilities in selected Arab countries. The contribution of this study will be significant, since its results should be beneficial to the researchers, educators, and business leaders. Findings can be especially important to policy makers as they can develop for example special training programs for these people to enhance their skills to do job efficiently.

**9. Project No. ME/AC Technology/350**

**Principal Investigator: Dr. Esmail Mokheimer**

**Co-Investigator #1: Dr. Faleh Al-Sulaiman**

**Co-Investigator #2: Dr. Ibrahim Habiballah**

**Co-Investigator #3: Dr. Tarek Abdel-Galil**

**Title: Techno-Economic Feasibility Study for Implementing Efficient Air Conditioning Technologies for Local Manufacturers of Small Central Air Conditioners**

**Abstract**

In Saudi Arabia, air conditioning load represents a major load in electricity network. Around 70 % of the electric power consumption goes to the building sector with about 70 % of that load being consumed by air conditioning systems. Also, investigations revealed that residential air conditioning has a sizeable contribution to the summer electric power peak load. The noticeable increase of the national income of the Kingdom of Saudi Arabia over the last few years resulted in an increasing growth rate of the residential sector with an obvious increase of the number of small villas and relatively large apartments used by small and new Saudi families. These small to medium size houses are using central or package air conditioning systems of capacities range between 7 to 10 TR for cooling during the relatively long summer season over a large portion of the Kingdom.

Due to this high increasing rate of the electric energy consumption in the residential sector, the Saudi government is planning of applying Minimum Energy Performance Standard on the residential electric appliances with particular emphasize on the Air Conditioners in a step which aims to improve the efficiency of the existing A/C units gradually. This step requires an interaction from local manufacturers to improve the efficiency of the locally manufactured A/C units.

The proposed study aims at investigating the techno-economic feasibility of enhancing the efficiency of residential air conditioners, of 7-10 TR size in terms of its Energy Efficiency Ratio (EER), by implementing new technologies in local manufacturers' facilities. An EER of 13 has been enforced on the US market early 2006. This

study will investigate the possibility of enforcing a similar limit to the market of KSA. The possible energy savings due to the enhancement of the A/C unit will be weighted against possible costs encountered by the manufacturers and the customers as well.

**10. Project No. MS/Rings/351**

**Principal Investigator: Dr. Jawad Abuihlail**

**Co-Investigator #1: Mr. Mohammad Jarar**

**Title: The Structure of tilting Modules over Commutative Rings**

**Abstract**

Tilting modules are considered as generalization of progenerators (which characterize Morita equivalences between categories of modules) and are attracting the attention of many researchers in different aspects of mathematics, including mainly “Representation Theory” of (finite dimensional, Artin) algebras, “Categories of Modules” and “Commutative Algebra”.

Several authors investigated the structure of tilting modules over special classes of commutative rings and domains. In particular, tilting modules over Prüfer domains were recently completely characterized and, moreover, a nice description of tilting modules over Dedekind and valuation domains has been already obtained. However, a complete description of the structure of tilting modules over (non-Prüfer) domains and more general classes of commutative rings is still not known.

In this research project, we aim to investigate and hopefully give a complete description of tilting modules (of arbitrary finite projective dimension) over special classes of non-Prüfer rings (e.g. Matlis domains, Krull domains and their generalizations, Iwangsawa-Gorenstein rings, etc.). We also study the structure of  $*^n$ -modules over commutative rings for  $n \geq 1$ , and investigate  $n$ -tilting modules over  $n$ -Prüfer domains for  $n \geq 2$ .

**11. Project No. ME/Sliding Wear/352**

**Principal Investigator: Dr. Amro Al-Qutub**

**Co-Investigator #1: Dr. Ibrahim Allam**

**Co-Investigator #2: Mr. M. Abdul Samad**

**Title: A Study on the Dry Sliding Wear of 6061 Al/Al<sub>2</sub>O<sub>3</sub> Particulate Reinforced Aluminum Alloys Against Automobile Brake Materials**

**Abstract**

Driven by the desire to reduce automobile weight and improve fuel efficiency, the auto industry has dramatically increased aluminum use in light vehicles in recent years. Aluminum components, including pistons, cylinder heads, engine carburetors, transmission housings, wheels, hoods, air intakes and bumpers have been used for many cars. One area that is being examined for potential weight reduction is the brake system. The current practice in automotive brake systems is to have the rotor made of fairly heavy



gray cast iron.

In recent years, automobile manufacturers have started to develop lighter and more advanced disc rotors and drums for passenger cars. There is also a keen desire for the development of an efficient brake material with excellent wear resistance for the use in high performance hybrid cars with reduced weight to improved performance. The possibility of replacing the conventional cast iron disc with cast aluminum, and aluminum based metal matrix composite rotors and drums are being explored for that purpose. However several problems with aluminum brake rotors are being investigated. The major problem is poor wear resistance. As a material, aluminum is too soft to be used for wear applications.

Currently manufacturers are considering the use of aluminum-composite (AMC), composed of aluminum and ceramic particles reinforcement, for brake rotors. It has been observed in the literature that, in sliding against metals and abrasives, aluminum matrix composite (AMC) exhibit better wear resistance compared to the alloys, specifically at elevated temperatures. However ceramic particles in the composite prove to cause accelerated wear to the brake pads. The current project suggest a possible innovative solution to the problem by using much smaller ceramic particles, submicron size compared to 10 – 30 micron in the currently used systems, for the reinforcement of the aluminum in the rotor. In addition, the use of smaller size ceramic particles was found to improve the machinability of the composite which improves the economics of the brake system.

This project aims to highlight the tribological behavior of Al/Al<sub>2</sub>O<sub>3</sub> submicron particulate reinforced composite sliding against the commercially available brake materials. Another objective of the project is to determine the effect of volume fraction of reinforcement on friction and wear of the system at different sliding speeds and applied loads.

**12. Project No. CRP/Localization/353**

**Principal Investigator: Dr. Adel Aldosary**

**Co-Investigator #1: Mr. Syed M. Rahman**

**Title: Localization in Saudi Arabia: Social and Economic Perspectives  
(Bookwriting Project)**

**Abstract**

Localization is an important issue from individual to national level at least in the context of Middle East especially in Saudi Arabia. But it is not possible to address this issue unless sufficient background related to this concept such as human resources development, manpower planning, and unemployment among nationals within the unique socio-economic characteristics of Saudi Arabia are provided. This book intends to shed light on localization in Saudi Arabia from national to international perspectives considering other important factors intermingled with this concept. There is a national need to be clear and firm in paving the roadmap of localization in Saudi Arabia. This book will critically investigate the steps taken by Government towards localization over the years. By addressing the role of public and private sector in localization this book will help the nation to perceive the concept of localization, its features and guide towards a balanced path which will stabilize our employment environment for long term without

harming our national development.

This book will be produced in a very lucid form without special terminologies so that anyone having satisfactory grasp on English will be able to understand and interpret. But this book mainly intends to serve any research in the field of Localization. This book can be successfully used as a reference book for many undergraduate and graduate courses which are related to Human Resources Development, Manpower Planning, and Unemployment in Saudi Arabia. This book will create a milestone in the field of Localization in the context of Saudi Arabia and Middle East which can help perceiving our day to day concerns regarding Saudization, Kuwaitization, Qatarization, Emiratization etc.

**13. Project No. MS/Laplace/354      Principal Investigator: Dr. Abdulaziz Alshuaibi**

**Title: Regularization and the Inverse Laplace Transform (Sabbatical leave project)**

#### **Abstract**

The main objective of this leave is to develop and improve new numerical techniques to approximate the solution of the historical inverse Laplace transform used to solve ODEs, PDEs and other linear systems in all branches of science and engineering. In this leave, we should be expected to learn a lot of methods and approaches that have been recently developed in order to pursue our research and come up with some new and efficient ideas for our graduate students. The topic is of great importance to applied inverse problems such as those that solve ODEs and PDEs in our engineering department at KFUPM and possibly in research and development centers in the Kingdom of Saudi Arabia.

**14. Project No. PH/CERIUM/355      Principal Investigator: Dr. S.M.A. Durrani**  
**Co-Investigator #1: Dr. M.F. Al-Kuhaili**  
**Co-Investigator #2: Mr. B.J. Abdul Aleem**

**Title: Development of Cerium Oxide Thin Film Gas Sensor for Monitoring Carbon Monoxide**

#### ***Carbon Monoxide (CO)***

Carbon monoxide (CO) is a colorless, practically odorless, and tasteless gas or liquid. Since it is impossible to see, taste or smell the toxic fumes, CO is called silent killer. It results from incomplete oxidation of carbon in combustion processes, burns with a violet flame. Sources of Carbon Monoxide are unvented kerosene and gas space heaters; leaking chimneys and furnaces; back-drafting from furnaces, gas water heaters, wood stoves, and fireplaces; gas stoves; generators and other gasoline powered equipment; automobile exhaust from attached garages; and tobacco smoke. Incomplete oxidation during combustion in gas ranges and unvented gas or kerosene heaters may cause high concentrations of CO in indoor air. Worn or poorly adjusted and maintained combustion devices (e.g., boilers, furnaces) can be significant sources, or if the flue is improperly sized, blocked, disconnected, or is leaking. Auto, truck, or bus exhaust from attached garages, nearby roads, or parking areas can also be a source.

**Some Important Data:**

- 0-1 ppm; normal level of CO in the air
- 9 ppm; maximum level in room with no harm to health
- 50 ppm; maximum level bearable for continuous exposure during eight hours
- 200 ppm; mild headache, nausea, dizziness
- 400 ppm; serious headache, life threatening after 3 hours
- 800 ppm; death after two hours
- 1600 ppm; nausea in 20 minutes, death after one hour
- 12,000 ppm; death within one to 3 minutes

**Project: (Sensor for Monitoring of CO)**

It is well known that the electrical conductivity of a metal-oxide changes as a result of interaction with several gases, however they do not change their form upon heating in air. As the process responsible for the change in conduction takes place at the boundary between the gaseous and solid state surface, special attention must be paid to the surface quality of the oxide. Because of the advantageous proportion of the surface to volume, a thin film of the metal-oxide will be the optimum arrangement for a sensor. The primary attractive feature of the semiconductor sensors is its low cost, relative to other gas sensors. The main objective of the proposed research is to develop  $\text{CeO}_2$  thin film gas sensors for monitoring carbon monoxide. Cerium dioxide has long been considered a useful material as a high-refractive-index film in single and multi-layer optical coatings. However, it has not found wide application because it tends to form inhomogeneous layers. This is due to the microstructure of the films, which consist of approximately cylindrical columns, several tens of nanometers in diameter, with voids between them. The packing density in the films is often much less than unity, typically 0.6, which shows that these films are highly porous. Films of cerium oxide are far more inhomogeneous (hence porous) than the films of zirconia or Titania. Recently for  $\text{SnO}_2$  and  $\text{HfO}_2$  CO sensor it was observed that among other film parameters CO sensitivity also strongly depends on the film porosity. Therefore keeping in view the film porosity and other mentioned parameters,  $\text{CeO}_2$  should be a candidate as sensitive CO sensor.

**15. Project No. MS/QUADRATIVE//356**

**Principal Investigator: Dr. Kassem Mustapha**

**Title:** An Alternative Direction Implicit Quadrative Petrov-Galerkin Method for Solving a Class of Time-Dependent Problem

**Abstract**

Many practical problems in biology, engineering, finance and physics involving time and spatial variables can be modelled as initial-boundary value problems (BVPs). These models in general cannot be solved analytically, and computer methods are employed to simulate the associated physical phenomena. A major class of computational schemes is based on the continuous finite element Galerkin (FEG) methods, in which an approximate solution at each fixed time of a model problem, posed on a spatial domain, is sought as a linear combination of piecewise polynomial (spline) functions defined on each finite element partition of the domain. The unknown time-dependent coefficients in the linear combination are usually computed using integration techniques.

The initial aim of the project is to study a C2 splines alternating direction implicit quadrature Petrov–Galerkin method (e.g., the approximate solution is chosen to be the smoothest cubic splines) for solving a class of time dependent problem of parabolic and hyperbolic types. Our numerical scheme is directly implementable on computer without any further approximation. Moreover, the cost of computing the numerical solution is optimal. We expect that our initial contribution can be used to solve a real system of PDEs such as the Schrodinger equation. Schrodinger equation has an application in several areas of physics such as quantum mechanics, optics, plasma physics, underwater acoustics, and seismology.

**16. Project No. MS/VECTOR/357 Principal Investigator: Dr. Qamrul Hasan Ansari  
Dr. Soliman Al-Homidan**

Title: Multiobjective Optimization and Vector Variational Inequalities

**Abstract**

The multi-objective optimization problem, also called *vector optimization problem*, plays a vital role in multiple criteria decision making problems. We intend to study the following two aspects of vector optimization problem (in short, VOP).

- Existence Theory
- Solution Methods

There are several techniques and methods to prove the existence of an efficient or weak efficient solution of (VOP). The theory of vector variational inequalities is one of the very powerful tools to establish the existence of an efficient or weak efficient solution as well as to develop some algorithm to compute the approximate solutions of (VOP). This theory is a relatively young discipline. Apparently, one of the main bases for its development was the pioneer work of F. Giannessi in 1980 on the theorems of alternatives with applications to vector extremum problems. Later, this theory has been extensively studied by many researchers.

By establishing the equivalence between (VOP) and some kind of vector variational inequality (in short, VVI), we shall study the existence of solutions as well as the solution methods for computing the approximate solutions of (VOP). We are also interested in introducing some kind of derivatives of multivalued maps and some kind of vector variational inequality problem involving contingent derivative / epiderivative (in short, CVVIP) in such a way that these could be used to prove the necessary and sufficient conditions for the minimizer of the optimization problem for multivalued maps (MVOP) under less assumptions than those considered in the literature.

To develop the solution methods for (VOP) and (MVOP) is not an easy task. There is another way to compute the approximate solutions of (VOP) and (MVOP), known as *scalarization method*. Scalarization means that replacement of a (VOP) by a suitable scalar optimization problem which is an optimization problem with a real-valued objective function. Since a large number of algorithms for different kinds of scalar variational inequality problems are given in the literature, we will try to scalarize our (VVIP), (CVVIP) and their generalized forms in such ways that the known algorithms could be used to compute the approximate solutions of scalar (generalized) variational inequality

problems. We shall also try to develop some new algorithms for scalar variational inequality problems and their generalized forms.

**17. Project No. MS/VECTOR/358**

**Principal Investigator: Dr. A. Aksoy**

**Co-Investigator: Mr. Mohammad Raashid**

**Title:** Enhancement of Technical Capability of the 14 MeV FNAA Facility at KFUPM

**Abstract**

The 14 MeV Neutron Activation Analysis (FNAA) is a non-destructive analytical technique for elemental bulk analysis of samples from catalysts, petrochemical, metal, mining and other industries.

The technical capability of the KFUPM 14 MeV FNAA Facility will be re-examined with the main change of introducing a sample rotator which will provide the biaxial rotation of the sample and standard during irradiation. The sensitivities of possible elements will be re-determined with new provision. Though minimum detection limit of all possible elements in the KFUPM 14 MeV NAA facility will be carried on, the emphasize will mainly be to the determination of the sensitivities of the short-lived radioisotopes of the half-life of less than 10 min for 28 elements (of B, N, O, F, Na, Al, Si, P, S, Cl, K, Ti, V, Cr, Mn, Ge, Se, Br, Y, Zr, Mo, Pd, Ag, Ba, Ce, W, Au and Pb). The 14 MeV NAA sensitivities of the new data from the facility will be compared with the literature values as well as with the data measured previously without the sample rotation.

The project is expected to open important opportunities for research in the university as well as for the local industries namely for Saudi Aramco and Catalysts industry. It will also provide means for academic usage of the facility.

**18. Project No. ME/Turbo/359**

**Principal Investigator: Dr. Amro Al-Qutub**

**Co-Investigator: Mr. M. Abdul Samad**

**Title:** Development of Further Capabilities for the ME High Temperature Tribometer

**Abstract**

Tribometers serve to characterize friction and wear behavior of materials. They are the basis for tribologically oriented development of materials and lubricants to serve quality assurance.

The most widely used tribometer for wear and friction testing is the Pin-on-Disc type and Ring-on-disc type. Some companies like Falex Corporation, CSEM instruments, CETR incorporated etc. are currently dealing in high temperature tribometers business, but the cost of their tribometers is too high exceeding \$127,000. The present high temperature tribometer which is being extensively used in the wear testing research, has been designed

and manufactured by Dr. Amro M. Al-Qutub in the ME department at KFUPM, and it satisfies ASTM standards designation G99-90.

This tribometer consists of a

- Motor drive system,
- Furnace & the specimen test chamber
- Loading Bars
- Programmable Controller

The technical specifications of the Tribometer are as follows:

- Continuous bidirectional rotation of the disc over a large range of sliding velocities (35 to 6900 rpm)
- Oscillation over a range of amplitudes simulative of bearings and seals in reciprocating machinery, e.g. piston/cylinder contacts.
- High temperature capability, 500 degrees centigrade.
- Torque measurements  $\pm 10\text{Nm}$  maximum with accuracy of 0.0025 Nm.
- Dry and lubricated tests capability.
- Controlled gas environment non-reactant with stainless steel or tool steel.
- Six points temperature measurement capability.
- Vertical load application on specimen, 0.5 to 500 N.
- It is capable of carrying out Pin-on-Disk wear tests.

We are planning to make some enhancements to the above mentioned tribometer in order to conduct the Ring-on-Disk wear tests. This would tremendously improve the capability of this equipment in terms of conducting different kinds of experiments. We also intend to develop a user manual for the same.

**19. Project No. MS-DCC/Decay/360**

**Principal Investigator: Dr. Said Berrimi**

**Co-Investigator: Dr. Salim Messaoudi**

Title: Study of Decay in Some Thermoelastic Systems

**Abstract**

We study some thermo-elastic systems with weak internal as well as, boundary conditions of memory type. We intend to establish general decay results. Our technique of proofs relies on the construction of appropriate Lyapunov functionals equivalent to the natural energy, of the solution in consideration, and which satisfies a differential inequality leading to the desired decay results. Our results, if obtained, will generalize and improve some existing ones in the literature.

**20. Project No. ICS/Fire-Wall/361**

**Principal Investigator: Dr. Khaled Salah**

**Co-Investigator: Dr. Mohammad Sqalli**

Title: Intelligent Firewall DoS Attacks and Countermeasures

## **Abstract**

Network firewalls are considered to be the first line of defense for private networks against malicious attacks originated from the Internet. Firewalls themselves can also become targets of Internet DoS (Denial of Service) and DDoS (Distributed DoS) attacks. In this research, we identify a potential DoS attack that can bring firewall processing power to its knees. Unlike traditional DoS attacks where high volume of traffic of useless DoS packets is used, this attack requires only a small volume of traffic as it uses DoS packets that are targeting the default rule or the last-matching rules. The default rule is typically the last rule in the rule set of the firewall. The last-matching rules are those that exist at the bottom of the firewall rule set. The last matching rules, including the default rule, require the most CPU processing power. In order to discover remotely these rules, the attacker probes intelligently the firewall. This research will demonstrate how such attacks can be devised. In addition, we will investigate possible remedies and countermeasures against these stealth and slow attacks and the schemes to discover last-matching rules. The effectiveness and implementation of such countermeasures will be addressed. The effectiveness will be measured in terms of firewall's throughput and CPU utilization.

**21. Project No. MS/Applications/362**

**Principal Investigator:**

**Dr. Abdul Rahim Khan**

**Co-Investigator-1: Dr. Soliman Alhomidan**

**Co-Investigator-2: Dr. Qamrul Hasan Ansari**

**Co-Investigator-3: Mr. Shamsuddeen Khan**

Title: Iterative Methods for Solving Variational Inequalities with Applications

## **Abstract**

In this project, we shall study the hybrid steepest descent method and viscosity approximate method in a more general setting with some mild conditions than those given in the literature. In particular, we shall suggest and analyze a relaxed viscosity iterative method for finding a common fixed point of a commutative family of nonexpansive self-mappings on a closed convex set of a reflexive Banach space. We shall also prove that the sequence of approximate solutions generated by the proposed method converges strongly to a solution of a variational inequality. Our relaxed viscosity iterative method would be an extension and a variant form of the original viscosity iterative method. Our results could be viewed as significant improvement and generalization of the corresponding results in the literature.

We shall propose hybrid steepest descent method and viscosity approximate method for a general variational inequality. No approximate method, similar to the above mentioned method, is available for computing the fixed points of a multivalued map so it is really a difficult task to put forward hybrid steepest descent method and viscosity approximate method for generalized variational inequalities. We shall try to achieve this goal. As applications of our new methods, we shall solve the pseudoinverse problem, convex / quadratic optimization problem and semi-definite programming problem. We shall also write computer programs for our methods and shall demonstrate their applications for a pseudoinverse problem, convex/quadratic optimization problem and semi-definite

programming problem.



**22. Project No. ACT/IT-Model/363**

**Principal Investigator: Dr. Mustafa Eid**  
**Co-Investigator-1: Dr. Salem Alghamdi**  
**Co-Investigator-2: Dr. Mohd. Al-Ahmadi**  
**Co-Investigator-3: Mr. Irfan Ahmad Ilyas**  
**Co-Investigator-4: Mr. Mubashir Hussein**

Title: A Conceptual IT-Based Model for Collaborative Research

**Abstract**

The main objective of this research is to deploy collaborative IT in the area of cooperative research to help the scientific community become more effective and efficient in their research activities. This research proposal is set to target the use of information and communication technology to facilitate collaboration in the scientific research community. In doing so, an in-depth understanding of a scientific collaboration process with the perspectives of both technical and social requirements is a must. Thus, the task of depicting a conceptual model for a scientific collaboration process will be addressed.

The model will then be utilized to identify different phases of a scientific collaboration process and the phase-specific requirements for ensuring an effective, smooth, and productive collaboration. The work addresses the transformation of the model requirements in the technological domain by producing an optimal high-level mapping, independent of any particular vendor. The resultant high-level mapping or technology design will be employed to plug-in the identified technology components by selecting from an available palette of IT options. The resultant system will then be sketched and tested to ensure its suitability to the requirements of the business community. Finally, recommendations on how to implement the findings will be provided.

**23. Project No. PH/Magnetic/364**

**Principal Investigator: Dr. Khalil Ziq**  
**Co-Investigator-1: Mr. A. Ghannam**  
**Co-Investigator-2: Mr. A.F. Salem**

Title: Magnetic Properties of ZnO-TM Semiconductor

**Abstract**

The promise that room temperature ferromagnetic semiconductors hope to deliver lies in their potential to carry semi-conducting materials and devices to a new dimension. The added degree of freedom provided by the ferromagnetic moment (spin) brings a new advantage and properties to the field of microelectronics. The **SPIN** degree of freedom transfers field of elec**TRONICS** to the new field of **SPINTRONICS**.

Dilute magnetic semiconductors (DMS) are the main promising material in this regards. An emerging wonder material is the zinc oxide (ZnO) doped with various magnetic ions ranging from transition to rare earth metals. The race is on for material that is magnetic semiconductors having two independent controllable degrees of freedom: charge and spin.

In this project, we propose to carry systematic magnetic characterization of ZnO doped

with transition metals. Single and double transition metal doping will be employed. To used different annealing procedures in an effort to eliminate or reduce the possible effects ion clustering, precipitation and ion migration to the grain boundaries or the reaction of grain boundary defects with oxygen.

**24. Project No. ICS/Peer/365**

**Principal Investigator: Dr. Farag Azzedin**

Title: Reputation Assessment Process in Peer-to-Peer Systems

**Abstract**

The need for reputation assessment is particularly strong in peer-to-peer systems because the peers' personal site autonomy is amplified by the inherent technological decentralization of the environment. However, the decentralization notion makes the problem of designing a peer-to-peer based reputation assessment substantially harder in P2P networks than in centralized settings.

Existing reputation systems tackle the reputation assessment process in an ad-hoc manner. There is no systematic and coherent way to derive measures and analyze the current reputation systems. In this project, we propose a reputation assessment process and use it to classify the existing reputation systems. Simulation experiments will be conducted to evaluate the proposed reputation assessment process's effectiveness to accurately predict the reputation of a target peer while minimizing the overhead of collecting, filtering, adjusting, and aggregating the recommendation requests. To the best of our knowledge, this is the first attempt at developing a reputation assessment process that can be used as a classification, comparison, and analysis tool for reputation systems.

**25. Project No. MGT/Gizmo/366**

**Principal Investigator: Dr. Asad M. Sadi**

**Co-Investigator-1: Dr. Salem Al-Ghamdi**

Title: Franchising a Gizmo for Small-Medium Sized Enterprises (SME) Development in Industrialized Economies: A Saudi Arabian Investigation

**Abstract**

Although concern about franchising issues is not entirely new in Saudi Arabia, there have been no previous attempts to study franchising in the context of Small-Medium Enterprises (SMEs). This is in spite of the fact that policy makers have been emphasizing the growing importance of franchising, as well as SMEs, in Saudi Arabia. This study seeks to examine the level of franchising and the factors that encourage SME entrepreneurs to join franchising arrangements instead of starting out on their own. It also aims to explore the elements embedded in a franchise arrangement which cause satisfaction or dissatisfaction about franchising among Saudi entrepreneurs.

The study will employ a methodology in which a survey questionnaire will be administered. The survey questionnaire will be distributed to a sample of respondents in the Eastern Province of Saudi Arabia. The study will also employ secondary information obtained from published research, service sector experts and the authors' own observations. It is hoped that findings from this study will provide valuable insights into

the efficacy of the franchising business and have important implications for SMEs in the Eastern Province.

**26. Project No. COE/Gate/367**

**Principal Investigator: Dr. Muhammad El-Rabaa**

**Co-Investigator-1: Dr. Abdelhafid Bouhraoua**

Title: Developing a Network-on-Chip for Field Programmable Gate Arrays

### **Abstract**

This project aims at providing a synergy of two major technologies; Field programmable Arrays (FPGAs) and Networks-On-Chips. FPGAs have gained considerable acceptance recently among VLSI designers not only as prototyping platforms but as system implementation platforms for applications with short time to market constraints. State of the art FPGAs have become very attractive for system-on-chip (SOC) designs due to their ease of use, flexibility, large gate count, efficient macros, abundance of I/Os, and re-configurability. FPGAs can be configured (and re-configured) to implement any digital processor or group of processors. Several cores could be implemented simultaneously that can communicate among themselves and the outer world.

A major disadvantage that has plagued FPGAs, however, is the relatively high configuration time (time needed to load all the configuration bits into the FPGA). This is due to the limited number of configuration ports and the serial nature of the configuration process. Increasing the number of configuration ports would be at the expense of regular data I/Os, something that users won't accept either. Existing solutions reduce configuration data through compression or use of wider data paths (i.e. several CLBs are configured with the same configuration bits) at the expense of added resources or reduced granularity. To hide configuration time, caching or multi-context configurations are also used at the expense of higher area cost.

Another problem that limited the performance of FPGAs was the relatively lower speed of interconnects. This is due to the nature of configurable inter-connects; global signals go through long wire segments and numerous switches, increasing their delay significantly. This significantly reduces the overall operating frequency. The same problem is faced by full-custom ASICs. Networks-On-Chips were proposed to solve the on-chip slow interconnect problem. They decouple the blocks performance from the inter-connect delay. Merging the two technologies (FPGAs and NoCs) has the potential of delivering the advantages of FPGAs while circumventing the long configuration time problem. Both regular data and configuration data could share the same I/O ports and interconnects, with each type having its own identifying type of header. The potential benefits for re-configurable computing, self-configuring systems, or evolutionary systems are enormous. Also, FPGA testing would become much more convenient with the faster configuration process.

The proposed research will deal with two major aspects of NoC integration on FPGAs. The first one is the nature of the NoC itself; should it have static architecture (frozen at design time) or be re-configurable, types of router and routing schemes, nature of links (synchronous or asynchronous), deadlock avoidance, buffering ...etc. The second issue

deals with the FPGA's reconfigurable logic; how could it be re-adapted and interfaced to a NoC, should conventional configurable interconnects be scraped or modified to co-exist with a NoC, how to eliminate interconnect hazards (e.g. connecting two outputs together). Different approaches will be investigated and evaluated using simulation as an experimentation test bed. The main objective is to find approach(s) that minimize area overhead and maximize throughput while keeping latency reasonable low. The FPGA architecture should still support conventional designs and multi-core (i.e. SoC) designs.

The major expected outcomes of this research effort are: a substantial contribution to the field demonstrated with publications in journal or conferences and/or patents, knowledge transfer through graduate student training as research assistant, and possible commercial utilization of developed circuits and techniques as intellectual property (IP) blocks.

**27. Project No. MS/Ring/368      Principal Investigator: Dr. Salah-Eddine Kabbaj**

Title: Trivial Ring Extensions Defined by Gaussian Conditions

**Abstract**

In 1932, Prüfer introduced and studied integral domains in which every finitely generated ideal is invertible. In 1936, Krull named these rings after H. Prüfer and stated equivalent conditions that make a domain Prüfer. Since then Prüfer domains have assumed a central role in the development of multiplicative ideal theory through numeral equivalent forms. These touched on many areas of commutative algebra, e.g., valuation theory, arithmetic relations on the set of ideals, and star-operations; in addition to several homological characterizations.

The extension of this concept to rings with zerodivisors gave rise to five classes of Prüfer-like rings; namely, Arithmetical rings (Fuchs 1949 and Jensen 1966), Semihereditary rings (Cartan-Eilenberg 1956), Gaussian rings (Kaplansky-Tsang 1965), Prüfer rings (Butts-Smith 1967 and Griffin 1970), Rings with weak dimension at most one (Glaz 1989 and 2005).

It is, however, notable that original examples -for each one of the above classes- are rare in the literature. This fact lies behind our motivation for studying trivial ring extensions. This project aims at investigating the transfer of the above-mentioned Prüfer conditions to trivial ring extensions. One of the consequence is to generate new and original examples to enrich the current literature with new families of Prüfer-like rings with zerodivisors. We'll particularly place more focus on the Gaussian property because of its connection with the 40-year-old content conjecture of Kaplansky.

**28. Project No. MS/Domain/369      Principal Investigator: Dr. Salah-Eddine Kabbaj**

Title: Subalgebras of Affine Domains over a Noetherian Domain

**Abstract**

In this research project, we are concerned with dimension theory of subalgebras of affine domains over Noetherian integral domains. In particular, we investigate Anderson-Dobbs-Eakin-Heinzer's open problem on whether the Krull setting occurring in the generalized

fourteenth problem of Hilbert yields (locally) Jaffard domains. To this purpose, we'll frame our work in the larger context of Bouvier conjecture which sustains the existence of finite-dimensional non-Jaffard Krull (or factorial) domains.

Finite-dimensional non-Noetherian Krull (or factorial) domains are scarce in the literature and one needs to test them and their localizations as well for the Jaffard property. One of these family stems from the generalized fourteenth problem of Hilbert (also called Zariski-Hilbert problem): Let  $k$  be a field of characteristic zero and let  $T$  be a normal affine domain over  $k$ . Let  $F$  be a subfield of the field of fractions of  $T$ . Set  $R := F \cap T$ . The Hilbert-Zariski problem asks whether  $R$  is an affine domain over  $k$ . Counterexamples on this problem were constructed by Rees (1958), Nagata (1960) and Roberts (1985 and 1990). In this line, Anderson, Dobbs, Eakin, and Heinzer (1990) asked whether  $R$  and its localizations inherit from  $T$  the Noetherian-like main behavior of having Krull and valuative dimensions coincide.

This problem will be addressed within the more general context of subalgebras of affine domains over Noetherian domains; namely, let  $A \subseteq R$  be an extension of domains where  $A$  is Noetherian and  $R$  is a subalgebra of an affine domain  $T$  over  $A$ . Our ultimate goal is to examine the possible transfer of the Jaffard and locally Jaffard properties to  $R$  and hence compute its Krull and valuative dimensions.

## **29. Project No. ICS/Logic/370      Principal Investigator: Dr. Krishna Rao**

Title: Learnability Results for Logic Programs and Term Rewriting Systems

### **Abstract**

The theory of inductive inference attempts to understand the all pervasive phenomena of learning from examples and counterexamples. The following are just a few examples of such process. After hearing and attempting to produce utterances in a natural language, a child gradually learns to frame sentences by acquiring a complicated and substantially correct grammar of the language. When pointed out by elders (through counterexamples, also called negative data), he/she corrects errors by updating his/her knowledge about the grammar. Similarly, one conveys main ideas and concepts in a technical seminar through a good collection of examples and counterexamples.

The theory of learnability has received a lot of attention in the last forty years. Many results have been published towards defining the boundary of learnability and unlearnability; what concepts can be learned by a machine given an appropriate data in different models and what cannot be learned. Logic programs with elegant and simple declarative semantics can be used as representations of the concepts to be learned. In fact, the problem of learning logic programs from examples has attracted a lot of attention starting with the seminal work of Shapiro in early eighties and many techniques and systems for learning logic programs are developed and used in many applications.

In the last few decades, term rewriting systems have played a fundamental role in the analysis and implementation of abstract data type specifications, decidability of word problems, theorem proving, computability theory, design of functional programming languages (e.g. Miranda), integration of functional and logic programming paradigms, etc. Even though, term rewriting systems have a very close relation to logic programs,

learnability of term rewriting systems did not receive much attention from learning theory community until recently. In the last two years, we have studied learnability of term rewriting systems and established first results on this topic. Since term rewriting systems are very similar to functional programs and any learning results on term rewriting systems can be transferred to functional programs.

The overall objective of the proposed research is to (a) develop a survey article on results for learnability of logic programs and term rewriting systems from positive data and entailment, putting the known results in a uniform framework, and (b) establish new results for learnability of logic programs and term rewriting systems from positive data and entailment.

**30. Project No. ME/ALLOY/371**

**Principal Investigator: Dr. Zuhair Gasem**

Title: Corrosion Behavior of New Generation High Strength Low Alloy (HSLA) Steel for Oil and Gas Pipelines

### **Abstract**

The increasing demand for oil and natural gas and increased prices will further influence the type of their transportation in the future. Long-distance pipelines are a safe and economic means to transport oil and gas from production sites to end users. There is a trend in the industry to use higher strength steel pipes to allow higher fluid pumping pressure. High-strength steels in grade X80 are nowadays state of the art. Grade X100 has been recently developed but not yet utilized. Full evaluation of corrosion properties of new generation steels for oil and gas pipeline application is crucial before they can find wide application. The proposed project aims to evaluate the corrosion behavior of the newest high strength low-alloy steels (X80 and X100) under conditions close to those experienced in some parts of Saudi Arabia.

The specific objectives of the proposed research project are summarized as follows:

- To address the effect of bicarbonate ions with different concentrations on the corrosion polarization behaviors of steels
- To study the fundamental role of aggressive chloride ions on pitting corrosion susceptibility of steels and compare their resistance against pitting
- To investigate the influence of the microstructure and alloying elements of steels on the passive film properties and its stability in bicarbonate solutions with/without the presence of chloride ions.
- To estimate and compare the corrosion rates for steels using a number of electrochemical methods.
- To examine the characteristic pitting features for steels in bicarbonate/chloride environments through the Scanning Electron Microscope (SEM) technique.

The outcome of this study can be useful for the oil and gas industry in deciding the economical benefits and corrosion related challenges when using X80 and X100 HSLA steels under CO<sub>2</sub> environments. The results can be used to develop a prediction model for CO<sub>2</sub> corrosion for X80 and X100 steels. The proposed project is 10-month long and has been written in collaboration with Professor A. Alfantazi, University of British Columbia,

Vancouver, Canada.

**31. Project No. AE/OPTIMAL/372**

**Principal Investigator: Dr. Hanafy Omar**

**Co-Investigator: Dr. Mohammad Abido**

Title: Optimal Design of Fussy-Based guidance Law for Homing Noisy  
Measurements Using Multi-Objectives Evolutionary Algorithms

**Abstract**

The main objective from this project is to propose a systematic approach to design a fuzzy-based guidance law for homing missiles. The noise in the measurements that is used to determine the missile commands will be considered in the design of this fuzzy guidance law. The proposed guidance law will be a combination of three fuzzy-based guidance laws; each one of these three laws will be active in a certain region of the interception range. The transition between these guidance laws will be supervised by another fuzzy inference system. The parameters of these fuzzy systems such as membership functions and rules will be derived using the multi-objective evolutionary algorithms.

The proposed approach will result in optimal fuzzy-based guidance law for homing missile with the existence of noisy measurements. The implementation of this design leads to a precise interception of the target in a short time and with a low consumption of power. This may enable the missile manufacturer to increase the missile destruction power by reducing the weight of the missile and increasing the weight of the warhead. It allows also the missile designer to replace the expensive inertial navigation systems by low cost ones that made of off-shelf components. The research will be conducted in four phases; problem formulation, studying the classical guidance laws and chooses three of them to be converted to linguistic forms, integrating the guidance laws developed in Phase II and apply the multi-objective evolutionary algorithm for optimal tuning of the integrated system, and finally a comparison with the existing guidance laws.

**32. Project No. EE/DATA/373**

**Principal Investigator: Dr. Tareq Y. Al-Naffouri**

Title: Broadcasting Data to Multiple User Groups Information; Theoretic  
Investigation of the Wide Band Case

**Abstract**

Broadcast (or point to multipoint) communication has attracted a lot of research recently. In this report, we consider the group broadcast channel where the users' pool is divided into groups, each of which is interested in common information. Such a situation occurs for example in digital audio and video broadcast where the users are divided into various groups according to the shows they are interested in. In this situation, the system capacity is inversely proportional to the number of users in each group. As such, the report considers wideband group broadcast channels in which the bandwidth is to increase with

the number of users and hence guarantee constant information rate. The report raises some information theoretic questions about the wideband group broadcast channel and how it behaves for large number of users and for wide bandwidth.

**33. Project No. CY/GOLD/374      Principal Investigator: Dr. Anvarhusain Isab  
Co-Investigator: Dr. Mohammad I.M. Wazeer**

Title: Synthesis of Gold (III)-Diamines Complexes and Their Interactions with Biological Molecules Studies by Solid and Solution NMR\

**Abstract**

Biomedical inorganic chemistry is a new, rapidly developing area that explores the application of inorganic chemistry in medicine. It offers real possibilities for the discovery and development of novel drugs with a new mechanism of action. Gold(III) complexes are isoelectronic and generally isostructural to platinum(II) complexes, and therefore it is anticipated that they will have activity similar to that of platinum(II) antitumor drugs. However, compared to the corresponding platinum(II) complexes, gold(III) complexes have not been well explored chemically possibly because few gold(III) complexes have been shown to be sufficiently stable in aqueous solution

In this project we will synthesize new complexes  $[\text{Au}(^{15}\text{N}_2\text{en})\text{Cl}_2]\text{Cl}\cdot 2\text{H}_2\text{O}$ ,  $[\text{Au}(^{15}\text{N}_2\text{prop})\text{Cl}_2]\text{Cl}$  and  $[\text{Au}(^{15}\text{N}_2\text{but})\text{Cl}_2]\text{Cl}$  (where *en* = ethylenediamine (1,2-diaminoethane), *pn* = 1,3-diamino propane and *bn* = 1,4 diaminobutane) and their structure will be determined by solid and solution NMR studies. The synthesis will be extended to other diamines like *N,N'*-*en*, *N,N'*-*pn*, *N,N'*-*bn* (where N or N' = Methyl, Ethyl, Propyl or *iso*-Propyl groups. These complexes will then be utilized to study the interactions with biomolecules such as Cysteine, Glutathione, Methionine, Captopril and Imidazoline-2-thione and its derivatives.  $^1\text{H}$ ,  $^{13}\text{C}$ ,  $^{15}\text{N}$  NMR of solid as well as solution NMR will be carried out.

**34. Project No. MS/Inviscid/375      Principal Investigator: Dr. Rajai Al-Assar**

Title: Transient Inviscid Flow Past Two Cylinders

**Abstract**

An exact solution of the transient problem of inviscid flow past two circular cylinders is to be obtained. The two cylinders may be of different diameters and located at any distance from each other. Two main cases are to be considered. The first is when the fluid moves perpendicular to the center-to-center line, and the second is when the fluid moves parallel to it (tandem cylinders). The stream function formulation will be used. The pressure distribution around the surfaces of the two cylinders will be calculated. The effect of the axis ratio of the two cylinders and the center-to-center distance on the flow field will be studied.



**35. Project No. EE/Low Density/376****Principal Investigator: Dr. Mohammad Adnan Landolsi****Co-Investigator: Dr. Aimen El-Maleh (COE)**

Title: Design and Implementation of Interconnect-Efficient Low Density Partly  
Check Error Connecting Codes

**Abstract**

There has been a strong interest in full-hardware implementations of advanced Forward Error Correcting (FEC) codes because of the intensive processing required by the iterative decoding algorithms used with these codes. In this regard, LDPC codes are widely seen to offer a distinctive advantage over their main competitors (turbo codes) since they are amenable to high parallelization, thereby enabling efficient implementation in VLSI technology. However, many of the recently introduced LDPC code designs produce complex (random-like) code structures that focus solely on improving error performance, but do not fully address hardware issues. In particular, because iterative decoding uses intensive “message passing” between the codeword variable and check bit nodes (which are randomly dispersed in random code structures), long interconnect wires are likely to become a limiting factor in hardware implementations, and this is the main motivation for the research work presented in this proposal.

More specifically, long interconnect wires increase the load capacitance resulting in slower designs and higher power dissipation. In addition, random code designs result in interconnect routing congestion, which reduces the chip area utilization. In this context, we propose to investigate the design of LDPC codes that lead to interconnect-efficient structures, while at the same time maintaining good error performance capability (by taking code girth conditioning aspects into consideration). The proposed work includes both theoretical design and hardware prototyping phases, and is expected to produce competitive LDPC codes in terms of error correcting capability and hardware decoding complexity.

**36. Project No. COE/Network/377    Principal Investigator: Dr. Tarek Sheltami****Co-Investigator: Dr. Ashraf Mahmoud**

Title: Maximizing the Number of Hops in Video Streaming Over Mobile Ad Hoc  
Networks Using Artificial Intelligence

**Abstract**

Wireless mobile ad hoc network data transmission between multiple senders and receivers is becoming increasingly important in nowadays networks. There are many applications for sending data from a single source to multiple destinations (e.g. broadcasting) or from multiple senders to multiple receivers (e.g. teleconference).

A wireless mobile ad hoc, or a multi-hop network (MANET) is a collection of wireless mobile hosts forming nodes that arbitrarily and randomly change their locations. No centralized administration or infrastructure is supported, and each host communicates via

radio packets. Nodes are responsible for establishing and maintaining connections between themselves. Such dynamic topology of MANET leads to several unique design issues that do not exist in other wireless networks.

Video transport over ad hoc networks is more challenging than over other wireless networks. The wireless links in an ad hoc network are not error resilient and can go down frequently because of node mobility, interference, channel fading, and the lack of infrastructure. Moreover, typical video applications may need a higher bandwidth and higher reliability connection than that provided by a single link in current or emerging wireless networks. On the other hand, it is possible to establish multiple paths between a source and a destination. Transporting video over wireless networks is further constrained by: delay limits, power issues and quality of service (QoS) parameters. All of these points should be handled carefully in video transport services.

This research is composed of the following

1. Comprehensive review of different video encoding and transport control techniques, and form a candidate set of solutions suitable for deployment over ad-hoc networks.
2. Build a thorough simulation code/tool for evaluation of performance of ad-hoc networks in terms of offered quality of service as a function of network parameters.
3. Evaluate the performance of the candidate set of solutions and form a reference performance figure for the network.
4. Design an energy-aware routing protocol and evaluate its performance over realistic deployment scenarios. The evaluation should consider variations of designed routing protocol (e.g. direct routing and cooperative routing) and test power models that are typically used in the literature.
5. Enhance the performance of the new protocol by applying Artificial Intelligence and Fuzzy Logic routines for better prediction of traffic routes.
6. Implement an ad-hoc wireless using laptops and/or handheld PCs supporting audio, video, and possibly other service over multi-hops.

The main goal of this proposal is to calculate the maximum number of hops the ad hoc network can support while satisfying delay, power, and QoS bounds. The outcomes of this proposal are applicable to many types of wireless networks. Examples of these applications include, but not limited to, on-the-fly conferencing applications, and integration scenarios between infrastructure-less and infrastructure networks (such as internet or cellular networks) to enhance the coverage. Finally, the implemented network can be deployed at any of KFUPM's conference/meeting facilities to provide immediate infrastructure-less connectivity as a prime example of former type of applications.

### **37. Project No. MS/WAVELET-2/378**

**Principal Investigator: Dr. Mohammad El-Gebeily**

Co-Investigator: Mr. Shafiqur Rahman (Res. Institute)

Title: Wavelet and Fractal Methods for the Analysis of Meteorological Data of Saudi Arabia: Phase 2

### **Abstract**

Wavelets and wavelet-based multi-fractals are becoming quite popular in the scientific study of real world problems, particularly climatic data. The Kingdom of Saudi Arabia possesses about 20 meteorological stations distributed throughout the country, where metrological parameters such as wind speed, wind direction, temperature, humidity and rainfall are continuously observed and recorded. We propose to use wavelet methods in time series analysis including the use of Walsh type wavelet packets for the analysis of weather related data such as rainfalls, wind speed, atmospheric pressure...etc. This work is a continuation and extension in several directions of a similar project, labeled phase I that resulted form the study of data from 9 stations in the kingdom.

**38. Project No. CY/BENZENE/379 Principal Investigator: Dr. Bassam El-Ali**  
Co-Investigator: Dr. Jimoh Tijani

Title: Rhodium-Catalyzed one Pot Hydroformylation-Cyclization Reactions of Allylbenzene Derivatives

#### **Abstract**

The principal objective of this project is the one pot catalytic conversion of allylbenzene derivative into aldehydes and naphthols by rhodium-catalyzed hydroformylation-cyclization processes. The allylbenzene derivatives that will be considered in this study are eugenol, eugenol methyl ether, estragole and their isomers. The products have biological activities and they are also used in flavor, perfume, and pharmaceutical industries. They are also versatile intermediates for the production of various fine chemicals. The study will focus on the effects of phosphine ligands and additives on the conversion of allylbenzene derivatives, on the regioselectivity of the reaction toward branched or linear aldehydes or naphthols as products. The recycling efficiency of the expensive rhodium catalyst will be also considered.

**39. Project No. PETE/SANDSTONE/380 Principal Investigator: Dr. Gharib Hamada**  
Co-Investigator: Dr. Moustafa El-Shafei

Title: Using Neural Networks to Estimate Petrophysical Properties of Sandstone Reservoirs from NMR Measurements

#### **Abstract**

Due to reservoir heterogeneity; many cores were acquired in different wells covering different reservoir units to create the proper porosity-density and permeability models for each. The uncertainty associated with identification of the proper porosity and permeability model for each unit is high, which could result in high permeability estimation far below the actual well performance. Therefore, integration on non standard tools like NMR with conventional tools and SCAL in the petrophysical evaluation is essential to reduce the uncertainty beyond the limitations of each tool in individual bases, especially in gas reservoirs. The aiming is to establish facies independent porosity and permeability models and capillary pressure curve.

The main task is to develop an Artificial Neural Network (ANN) approach to predict the most important petrophysical properties using NMR and conventional logging data for studied tight gas sand reservoir and also to validate the model in similar fields. The advantage of the ANN approach is to deal with new zones where there is no logging data; this is in addition to produce good estimate of the reservoir petrophysical parameters.

**40. Project No. CIM/GENDER/381    Principal Investigator: Dr. Mourad Mansour**  
Co-Investigator: Dr. Mustapha Achoui

Title: Gender and Job Satisfaction among Employees in Saudi Arabia

#### **Abstract**

Job satisfaction has been widely studied over the years. Tziner and Vardi (1984) define work satisfaction as an effective response or reaction to a wide range of conditions or aspects of one's work such as pay, supervision, working conditions, and/or the work itself. Others define it as an effective orientation towards anticipated outcome (Wanous and Lawler, 1972) or a statement that describes the feelings of employees about their work (Arches, 1991). This study is intended to investigate the perceived relationship between gender and job satisfaction among employees in Saudi Arabia. A questionnaire will be designed for this study and distributed in the three main regions in the Kingdom in private companies as well as governmental agencies. The findings of this study will shed some light and contribute to the cross-cultural literature on work and demographic related issues and should be useful to researchers, policy makers, academic leaders and educators.

**41. Project No. PH/CRYSTAL/382    Principal Investigator: Dr. Abdullah Alsunaidi**

Title: Dynamics and Morphology of Phase Separating Liquid-Crystal/Polymer Blends

#### **Abstract**

The morphology and kinetics of phase separating liquid crystal-polymer blends are expected to be different from those in simple fluids as a result of dynamical asymmetry and orientational ordering (nematic, smectic and crystallization) of the liquid crystal molecules. Here, we investigate the effect of these two processes on the phase separation of three-dimensional rod-coil mixtures. In the first part of the project the coexistence curve (phase diagram) for rod-coil mixtures interacting via a soft potential will be constructed using the Gibbs ensemble Monte Carlo method. After that, the dissipative particle dynamics method (DPD) is used to simulate the dynamics of phase separation in these mixtures. Our parameters will be the volume fraction of the rods ( $\phi$ ) and the quench temperature  $T$ . Quenches in the isotropic-isotropic, isotropic-nematic and isotropic-smectic regions of the phase diagram will lead to different growth rates. Also, critical quenches ( $\phi = 0.5$ ) and off-critical quenches ( $\phi \neq 0.5$ ) are expected to exhibit different morphologies in the early stages of phase separation. In this study, we will also consider the effect of an external electric field on the phase separation process.

**42. Project No. ICS/LINUX/383    Principal Investigator: Dr. Khaled Salah**

Title: Improving the Performance of Linux Networking Subsystem

**Abstract**

The latest version of Linux networking subsystem (known as NAPI) was designed to improve Linux performance to suit today's Gigabit traffic. NAPI is definitely a major step up from earlier Linux versions. However, NAPI has shortcomings and its performance can be enhanced considerably. In previous work, we proposed a hybrid interrupt handling scheme to improve the performance of Gigabit network hosts in terms of throughput, latency, and CPU availability. Our proposed hybrid scheme switches between the scheme of interrupt disabling-enabling and polling. We proved theoretically and using simulation that our hybrid scheme outperforms NAPI. In this research we intend to modify the latest version of Linux to implement efficiently our proposed scheme. We will also ensure that our hybrid scheme include efficient algorithms and techniques to overcome the shortcomings of NAPI and to improve its performance considerably. We intend to prove experimentally that our proposed scheme outperforms NAPI under different system configurations and load conditions.

**43. Project No. PH/MULTIPLE-QUESTIONS/384**

**Principal Editor: Dr. Abdulaziz Aljalal**

**Co-Editors: Dr. Ibrahim Nasser**

**Mr. Khateeb-ur-Rahman**

Title: Publishing the book (Manual Editing) entitled "General Physics: Multiple-Choice Questions: Waves, Thermodynamics, Electricity and Magnetism

**Abstract**

General Physics Multiple-Choice Questions book is a collection of about 950 multiple-choice questions in the area of waves, thermodynamics, electricity, and magnetism. Each question has five choices one of which is correct. These questions have been used to test KFUPM students taking Phys 102 over a period of couple of years. The questions are organized according to the sections of Phys 102 textbook Fundamental of Physics by Halliday, Resnick and Walker, 6<sup>th</sup> edition. Phys 102 covers 15 chapters, namely, chapter 17 to chapter 31. Whenever available, difficulty and discrimination level extracted from the performance of KFUPM students are included in the top of the question. The answer keys are gathered at the end of the book.

This book will be of special value to KFUPM physics faculty members, especially, in preparing quizzes and new questions for exams. Because it is arranged according to section numbers, it will help in seeing the type of questions asked to test certain concepts. The difficulty level included with some questions gives an accurate quantitative evaluation of the difficulty of some type of questions and it sets a good reference to compare performances.

The book will be also very helpful for KFUPM students. In particular, when a student feels he has some weaknesses in understanding some concepts. He can study the questions listed in the section he would like to understand more. Students are encouraged to solve the problems themselves and find out if they got the right answer from the answer key at the end of the book. Moreover, the questions in the book will be quite useful for any teacher or student taking general physics with multiple-choice tests.

**44. Project No. EE/OPTICAL/385 Principal Investigator: Dr. Abdel Aal Mantawy**

**Co-Investigator-1: Dr. Mohammad Shwehdi**  
**Co-Investigator-2: Dr. Jamil Bakhshwain**

Title: Distributed Generation Integration for Optimal Operation and Improved Performance of Distribution System

**Abstract**

This research proposal is prepared for KFUPM Research Committee to be done partially during sabbatical leave. Distribution system expansion planning is crucial due to the unexpected ascend of electrical demand. Nowadays, Distributed Generation (DG) is a new approach in the electricity industry to meet the electrical demand growth in a suitable manner. DG is expected to become more important in the future generation system. A study by the *Electric Power Research Institute* (EPRI) indicates that by the year 2010, 25% of the new generation will be distributed. The proper integration of DG in the distribution system design may lead to many system support benefits including; loss reduction, improved utility system reliability, voltage support, improved power quality, transmission and distribution capacity release. This research work aims to study different issues related to integrating the DG in electrical distribution system. The study will investigate different technology available, optimal size, optimal location and the effects of DG on distribution system performance. The proposed solution algorithm is used to optimally find the distribution system design that meets the demand growth with improved system performance. The performance measure includes; reduced system losses, reduced system voltage drop, increased system reserve and improved voltage stability. As the DG technology is in operation in many places in Saudi Arabia such as for example in ARAMCO and SABIC (SADAF) companies, the developed algorithm will be applied to two of these real distribution systems to demonstrate applicability of this research to Saudi Arabia progressing industry. Finally the obtained results from this research work of the systems under study will be revised and guidelines for distribution system expansion planning will be established.

**45. Project No. ICS/ALGORITHM/386    Principal Author: Dr. Nasir Al-Darwish**

Title: A Practitioner's Guide to Developing and Programming Algorithms

**Abstract**

This book is intended to provide a thorough treatment of fundamental algorithmic concepts while balancing coverage between theory and implementation. The standard text books on algorithms limit the presentation of many algorithms to high-level pseudo code description and omit details associated with proper data structures needed for algorithm implementation. On the other hand, this book advocates an approach that emphasizes programming algorithms and their utilization in some interesting applications.

The author believes that students will enhance their understanding of algorithms and become more motivated if they are also taught how to become better programmers, say by presenting *well-coded complete* programs. To achieve this end, the book is accompanied by a CD-ROM with complete programs for many of the algorithms and solved exercises covered in the book. Furthermore, the book discusses several interesting complete

applications demonstrating useful data structures, algorithms and programming techniques.

The book is intended primarily for use as a primary or reference textbook for undergraduate courses in algorithms. It can also be used for self-study by computer science professionals since it discusses technical issues in algorithm design as well as programming aspects.

**46. Project No. COE/Nanoscale/387    Principal Investigator: Dr. Aimen El-Maleh  
Co-Investigator: Dr. Ahmed Al-Yamani**

Title: Transistor-Level Defect Tolerant Digital System Design at the Nanoscale

**Abstract**

Nanotechnology-based fabrication is expected to offer the extra density and potential performance to take electronic circuits beyond the scaling limits reached by CMOS technology. Industrial research is indicating that nanodevices-based circuit design will be based on the acceptance that a certain percentage of devices in the design will be defective. In this work, we investigate a defect-tolerant technique that adds redundancy at the transistor level and provides built-in immunity to permanent defects. The investigated technique is based on replacing each transistor by an  $N^2$ -transistor structure ( $N=2, 3, \dots, k$ ). An  $N^2$ -transistor structure guarantees defect tolerance of all defects of multiplicity  $\leq (N-1)$  in each transistor structure. Thus, a large number of multiple defects, distributed among the structures, can be tolerated. In addition, interconnect defects can be equally tolerated. Our initial results on the tolerance of stuck-open and stuck-short defects based on the quadded-transistor structure ( $N=2$ ) are promising. Further analysis and extension of the technique for tolerance of bridging faults is required to demonstrate the applicability of the technique to practical designs. Extension of the technique to handle soft errors will also be proposed. An important advantage of the proposed transistor-level defect tolerant technique is that it fits well in existing design and test methodologies. Comparison of defect tolerance of this approach against other recently proposed defect-tolerant approaches will be evaluated experimentally. Furthermore, comparison of defect tolerance between circuits implemented based on the quadded-transistor structure and those implemented based on transistors with quadruple the feature sizes will be conducted based on inductive fault analysis. We predict that the combination of defect tolerance at both the transistor level and gate level will result in a significant improvement in circuit defect tolerance. For example, implementing majority gates with the  $N^2$ -transistor structure in Triple Modular Redundancy defect-tolerant techniques is considered promising and will be investigated in this work. Finally, the application of the quadded-transistor structure in the defect tolerance of logic implemented based on crossbar switches and FPGAs will be investigated. The regularity in crossbar switches and FPGAs make them excellent candidates for implementations based on nanotechnology. This will be evaluated and compared against recently proposed defect avoidance techniques.

**47. Project No. PH/Cancer/388    Principal Investigator: Dr. Nabil Maalej  
Co-Investigator #1: Dr. Akhtar Naqvi**

## **Co-Investigator #2: Dr. Mohammad Deriche**

**Title:** Cancer Treatment Dosimetry Using Monte Carlo Simulation of Photon Beam Interaction with Body Tissues

### **Abstract**

The aim of this project is to develop tools for accurate simulation of particle interaction with the human body. The most accurate method for simulating particle interaction with tissues is the Monte Carlo (MC) simulation method. In this project, we plan to develop MC based dose calculation for photon beam interaction with human tissues. We plan to use general purpose MC programs and develop tools to study particle interaction and dose deposition in the human body. We will start by using the MC simulation of interaction with body tissues and organs obtained from the Visible Human Project (VHP) data that is the most elaborate and complete computerized database of the human body assembled by the US National Library of Medicine. Then we will use MC simulation to study particle interaction with body tissues and organ obtained from segmented and processed Computerized Tomography (CT) images of cancer patients. We will compare dose distribution obtained from MC and the commonly used convolution superposition method in treatment planning software (PlanUNC) for the VHP data and for real patient CT data. Finally, we will perform dose measurement in a human body phantom to validate the MC dose calculation tools. Through this project we plan to build our KFUPM medical physics group expertise in human body dosimetry using MC Methods. We will also be able to significantly contribute to key research question related to dose measurement and calculation inside the human body during clinical radiation therapy, diagnostic imaging and nuclear medicine procedures.



### 3. RESEARCH/BOOK-WRITING PROJECTS CURRENTLY SUPPORTED BY THE UNIVERSITY

College / Department -----	Principal Investigator / Co-Investigator(s) -----	Title of the Project and its Code -----
<b>College of Engineering Sciences</b>		
Aerospace Engineering	<b>Dr. Hanafy M. Omar</b> <b>Dr. Mohammad Abido (EE)</b>	Optimal Design of Fuzzy-Based Guidance Law for Homing Noisy Measurements Using Multi-objectives Evolutionary Algorithms <b>(AE/OPTIMAL/372)</b>
Chemical Engineering	<b>Dr. Usamah Al-Mubaiyedh</b>	The Stability and Dynamics of Non-Isothermal Taylor-Coutte Flow: Influence of Viscous Heating, Buoyancy and Fluid Thermal Sensitivity <b>(CHE/TAYLOR-FLOW/262)</b>
Chemical Engineering	<b>Dr. Muhammad Al-Arfaj</b> <b>Dr. Hussain Al-Duwaish (EE)</b>	Development and Application of State Estimators in Control of Reactive Distillation <b>(CHE/DISTILLATION/272)</b>
Chemical Engineering	<b>Dr. Nadhir Al-Baghli</b>	Photoxidation of MTBE in the Presence of Hydrogen Peroxide <b>(CHE/MTBE/275)</b>
Chemical Engineering	<b>Dr. Basel Abu Sharkh</b> <b>Dr. Shaikh Asrof Ali (Chem)</b> <b>Dr. Ibnelwaleed Hussain</b> <b>Dr. Hasan Al-Mualem (Chem)</b>	Influence of Hydrophobe Architecture on Self-Assembly, Rheology, and Interfacial Properties of Amphiphilic oleyelectrolyte, Polyampholyte and Neutral Co-Polymers. <b>(CHE/ COPOLYMERS/292)</b>
Chemical Engineering	<b>Dr. S.M. Javaid Zaidi</b> <b>Dr. Sleem ur Rahman</b> <b>Dr. Ibnelwaleed Hussain</b>	Development of Highly Conductive Composite Membranes for Medium Temperature PEM Fuel Cell <b>(CHE/PEM FUEL CELL/294)</b>

<b>College / Department</b> -----	<b>Principal Investigator / Co-Investigator(s)</b> -----	<b>Title of the Project and its Code</b> -----
Chemical Engineering	<b>Dr. Saleem ur Rahman (Che)</b> <b>Dr. Ahmad Yamani (EE)</b>	Development of Solid-Liquid Mass Transfer Probe Based on Limiting Diffusion Current: Application to Stirred Tanks <b>(CHE/MASS/302)</b>
Chemical Engineering	<b>Dr. Sulaiman Al-Khattaf</b> <b>Mr. Nasiru Tukur (Che)</b>	Novel process for Methanol Alkylation of Toluene to Produce Xylene <b>(CHE/ALKYLATION/ 317)</b>
Chemical Engineering	<b>Dr. Ramazan Kahraman</b> <b>Dr. Saleem ur Rahman</b> <b>Dr. Mesfer Al-Zahrani (CE)</b> <b>Dr. Salah Al-Dulaijan (CE)</b>	Corrosion Investigation of Stainless Steel and Stainless Steel Clad Reinforcing Bars <b>(CHE/STEEL/ 320)</b>
Chemical Engineering	<b>Dr. Habib Al-Ali</b> <b>Dr. Habib Zughbi (Consultant)</b>	Investigation of the Hydrodynamics of a Moving Bed Reactor. <b>(CHE/MOVING BED/328)</b>
Chemical Engineering	<b>Dr. Saleem ur Rahman (Che)</b> <b>Dr. O.S.B. Al-Amoudi (CE)</b> <b>Dr. Shamshad Ahmad (CE)</b>	An Exploratory Study on Corrosion Protection of Reinforcing Steel in Concrete Using Conducting Polymers <b>(CHE/POLYMER/329)</b>
Chemical Engineering	<b>Dr. Javaid Z.M. Zaidi (Che)</b> <b>Dr. Ibnelwaleed Hussain (Che)</b> <b>Dr. Usamah Mubaiyedh (Che)</b>	Separation of Binary Organics Mixtures Using Novel Composite Polymeric Membranes by Pervaporation <b>(CHE/Binary/341)</b>
Chemical Engineering	<b>Dr. Ibnelwaleed A. Hussein,</b> <b>Dr. Basel F. Abu Sharkh,</b> <b>Dr. Muhammad Al-Arfaj,</b> <b>Dr. João B.P. Soares,</b> <b>Professor of Chemical Eng., University of Waterloo, Canada, Consultant</b>	Synthesis; Solution, Melt, and Solid-State Properties; and Modeling of Metallocene Polyolefins with Controlled Long Chain Branching <b>(CHE/Metallocene/347)</b>

<b>College / Department</b> -----	<b>Principal Investigator / Co-Investigator(s)</b> -----	<b>Title of the Project and its Code</b> -----
Chemical Engineering	<b>Dr. Habib Al-Ali</b>	Cost Effective and Optimum Strategies for Emission Reduction in Refineries <b>(Sabbatical Leave Project) (Che/Refineries/348)</b>
Civil Engineering	<b>Dr. Ali Al-Gadhib</b>	Numerical Simulation of the Evolved Physico-Chemical Distress in Concrete Repairs and Concrete Structures (Sabbatical Leave) <b>(CE/CONCRETE/313)</b>
Civil Engineering	<b>Dr. M.H. Blauch Dr. Ali Al-Gadhib Dr. Ahmad S. Al-Gahtani Dr. M. Kalimur Rahman</b>	Engineering Guidelines for Application and Design of Prestressed Precast Hollow Core Concrete Slabs Strengthened with CFRP Sheets <b>(CE/Design/336)</b>
Electrical Engineering	<b>Dr. Ahmad Yamani Dr. Mohammed Deriche</b>	Extraction of Optimal Features from Ultrasonic NDT Signals Using Time-Frequency and Time-Scale Distributions <b>(EE/ULTRASONIC/318)</b>
Electrical Engineering	<b>Dr. A. Zerguine Dr. L. Cheded Dr. Asrar Sheikh</b>	Performance Evaluation of a Soft Decision Based Least Mean Fourth (LMF) Algorithm: Applications to Wireless Communications <b>(EE/LEAST-MEAN/327)</b>
Electrical Engineering	<b>Dr. Husain Masoudi (EE)</b>	Broad-Band Time-Domain Beam Propagation Method (Sabbatical leave proposal) <b>(EE/TIME DOMAIN/315)</b>
Electrical Engineering	<b>Dr. Husain Al-Zaher (EE) Mr. Mohd. K. Al-Ghamdi Mr. Noman Tassaduq</b>	CMOS LOWPASS Filters for Dual Bluetooth/WLAN Direct-Conversion Receiver <b>(EE/LOW-PASS/324)</b>

Electrical Engineering	<b>Dr. Mohammad Adnan Landolsi</b> <b>Dr. Wajih Abu-Al-Saud</b> <b>Engr. Ahmad Abul-Hussain</b>	Development of a Software-Defined Radio Platform for Communication System Design <b>(EE/Platform/332)</b>
<b>College / Department</b> -----	<b>Principal Investigator / Co-Investigator(s)</b> -----	<b>Title of the Project and its Code</b> -----
Electrical Engineering	<b>Dr. M. Mohandes (EE)</b> <b>Dr. Maan Kousa (EE)</b> <b>Dr. S. Al-Shahrani (EE)</b> <b>Mr. A. Abul Hussain (EE)</b>	RFID Wristband Tag for Pilgrims Identification <b>(EE/Wristband/340)</b>
Electrical Engineering	<b>Dr. Tarek Y. Al-Naffouri</b>	The Effect of Spatial Correlation on the Capacity of Multi-Input Multi-Output Broadcast Channels with Partial Side Information <b>(EE/Spatial/342)</b>
Electrical Engineering	<b>Dr. Shaikh Sharif Iqbal (EE)</b> <b>Dr. Saad Al-Shahrani (EE)</b>	Design of Active 24-GHz Micro Strip Linear Phased Array-Antenna for Microwave Sensors <b>(EE/Microwave/345)</b>
Electrical Engineering	<b>Dr. Tarek Y. Al-Naffouri</b>	Broadcasting Data to Multiple User Groups: Information Theoretic Investigation of the wide Band Case <b>(EE/Data/373)</b>
Electrical Engineering	<b>Dr. Abdel-Aal Mantawy</b> <b>Dr. Mohammad H. Shwehdi</b> <b>Dr. Jamil Bakhawain</b>	Distributed Generation Integration for Optimal Operation and Improved Performance of Distribution System <b>(EE/Optimal/385)</b>
Electrical Engineering	<b>Dr. Mohammad Adnan Landolsi (EE)</b> <b>Dr. Aimen Al-Maleh (COE)</b>	Design and Implementation of Interconnect-Efficient Low Density Parity Check Error Connecting Codes <b>(EE/Density/376)</b>

Mechanical Engineering	<b>Dr. Zaki Ahmad (ME)</b>	Principles of Corrosion Engineering and Corrosion Control (Book-writing Project) <b>(ME/COR. ENG. /258)</b>
Mechanical Engineering	<b>Dr. Mohammad Antar Dr. Maged El-Shaarawi</b>	Entropy Generation Around a Solid/Liquid Sphere in a Gas Stream <b>(ME/ENTROPY/261)</b>
<b>College / Department</b> -----	<b>Principal Investigator / Co-Investigator(s)</b> -----	<b>Title of the Project and its Code</b> -----
Mechanical Engineering	<b>Dr. Zaki Ahmad Dr. Maysser Al-Haddad Mr. B.J. Abdul-Aleem</b>	Exploring the Corrosion Behavior of New Generation Scandium Reinforced Aluminum Alloys for Service Performance <b>(ME/ALLOYS/288)</b>
Mechanical Engineering	<b>Dr. Mohammad Antar</b>	Accurate Estimation of Heat Leak Through Hollow Building Blocks <b>(ME/HOLLOW/323)</b>
Mechanical Engineering	<b>Dr. Amro Al-Qutub Dr. Mohammad Allam Mr. M. Abdul Samad</b>	A Study on the Dry Sliding Wear of 6061 Al/Al <sub>2</sub> O <sub>3</sub> Particulate Reinforced Aluminum Alloys Against Automobile Brake Materials <b>(ME/Sliding Wear/352)</b>
Mechanical Engineering	<b>Dr. Esmail Mokheimer Dr. Tarek Abdel-Galil Dr. Faleh Al-Sulaiman Dr. Tarek Abdel-Galil (Consultant)</b>	Techno-Economic Feasibility Study for Implementing Efficient Air Conditioning Technologies for Local Manufacturers of small Central Air Conditioners <b>(ME/AC Technology/350)</b>
Mechanical Engineering	<b>Dr. Amro Al-Qutub Mr. M. Abdul-Samad</b>	Development of Further Capabilities for the ME High Temperature Tribometer <b>(ME/Turbo/359)</b>

Petroleum Engineering	<b>Dr. Gharib M. Hamada</b> <b>Dr. Moustafa El-Shafei</b> <b>(SE)</b>	Using Neural Networks to Estimate Petrophysical Properties of Sandstone Reservoirs from NMR Measurements <b>(PETE/SANDSTONE/380)</b>
<b>College of Comp. Sci. &amp; Engg.</b> Information & Computer Science	Dr. M. Sarfraz	Interactive Curve Design with Applications in Computer Graphics, vision and Image Processing <b>(ICS/GRAPHICS/306)</b>
<b>College / Department</b> -----	<b>Principal Investigator / Co-Investigator(s)</b> -----	<b>Title of the Project and its Code</b> -----
Information & Computer Science	Dr. M. Sarfraz	Reverse Engineering for Geometric Models Using Evolutionary Heuristics <b>(ICS/REVERSE ENG/312)</b>
Information & Computer Science	Dr. Wasfi Al-Khatib <b>Dr. Sabri A. Mahmoud</b>	Toward Content-Based Indexing and Retrieval of Arabic Manuscript <b>(ICS/INDEX/325)</b>
Information & Computer Science	Dr. M. Sarfraz <b>Dr. Sabri A. Mahmoud</b>	Toward Content-Based Indexing and Retrieval of Arabic Manuscript <b>(ICS/Optical Test/337)</b>
Information & Computer Science	Dr. Khaled Salah <b>Dr. Mohammad Sqalli</b>	Intelligent Firewall DoS Attacks and Countermeasures <b>(ICS/Fire-Wall/361)</b>
Information & Computer Science	Dr. Krishna Rao	Learnability Results for Logic Programs and Term Rewriting Systems (Release Time) <b>(ICS/Logic/370)</b>
Information & Computer Science	Dr. Farag Azzedine	Reputation Assessment Process in Peer-to-Peer Systems <b>(ICS/Peer/365)</b>
Information & Computer Science	Dr. Khaled Salah	Improving the Performance of Linux Networking Subsystem <b>(ICS/Linux/383)</b>

Computer Engineering Department	Dr. Mohammad Sadiq Sait <b>Dr. A.S. Abdul Waheed</b> <b>Mr. Mahmoud R. Minhas</b>	Parallel Iterative Heuristics for Performance-Driven Low- Power VLSI Standard Cell Placement <b>(COE/CELL.PLACE/263)</b>
Computer Engineering	<b>Dr. Muhammad El-Rabaa</b> <b>Dr. Abdelhafid Bouhraoua</b>	Developing a Network-on- Chip for Field Programmable Gate Arrays <b>(COE/GATE/367)</b>
Computer Engineering	<b>Dr. Aimen El-Maleh</b> <b>Dr. Ahmad Al-Yamani</b>	Transistor-Level Defect Tolerant Digital System Design at the Nanoscale <b>(COE/Nanoscale/387)</b>
<b>College / Department</b> -----	<b>Principal Investigator / Co-Investigator(s)</b> -----	<b>Title of the Project and its Code</b> -----
Systems Engineering	<b>Dr. Umar Al-Turki</b> <b>Dr. Shokri Z. Selim</b> <b>Dr. Abdulbasit Andijani</b>	On Stochastic Single Mac-hine Early-Tardy Scheduling <b>SE/SCHEDULE/191</b>
Systems Engineering	<b>Dr. Malick Ndiaye</b>	Locating Facilities with Various Distance Functions <b>(SE/LOCATION/307)</b>
Systems Engineering	<b>Dr. Salih O. Duffuaa</b> <b>Dr. Mohammad Darwish</b> <b>Dr. Ahmed Haron</b>	Multi-Objective Mathematical Models for Process Targeting <b>(SE/MATH MODEL/321)</b>
Systems Engineering	<b>Dr. Muhammad Shafiq</b> <b>Dr. Fouad Al-Sunni</b>	Adaptive Tracking of Non- Minimum Phase Discrete-Time Plants Using Inverses of Signals <b>(SE/DISCRETE TIME/323)</b>
Systems Engineering	<b>Dr. Mohammad Ben Daya</b> <b>Dr. Salih Duffuaa</b> <b>Dr. Abdul Raouf</b>	Maintenance Engineering and Management (Book Editing Project) <b>(SE/Maint.Mgt/331)</b>
<b>College of Industrial Management</b> Accounting & MIS	<b>Dr. Haider Madani</b>	Corporate Disclosure and Reporting Practices in the Gulf Cooperative Council Countries: A Cross-National Comparative Investigation <b>(CIM/DISCLOSE/248)</b>

Accounting & MIS		<b>Dr. Ahmad Abu Musa</b> <b>Dr. Jasem Al-Rumaihi</b> <b>Dr. Mohammad Al-Khaldi</b>	Evaluating the Security Controls of Computerized Accounting Information Systems in Saudi Arabian Banks <b>(CIM/SECURITY/303)</b>
Accounting & MIS		<b>Dr. Mustafa Eid</b> <b>Dr. Salem Al-Ghamdi</b> <b>Dr. Mohammad Al-Ahmadi</b> <b>Mr. Irfan Ahmad Ilyas</b> <b>Mr. Mubashir Hussein</b>	A Conceptual IT-Based Model for Collaborative Research <b>(ACT/IT-Model/363)</b>
Department Management Marketing	of &	<b>Dr. Alhassan Abdulmuhmin</b> <b>Mr. Irfran Ilyas (Mgt &amp; Mkt)</b>	Awareness, Adoption and Maturity Level of Customer Relationship Management (CRM) Practices in Saudi Companies <b>(CIM/Customer/338)</b>
<b>College / Department</b> -----		<b>Principal Investigator / Co-Investigator(s)</b> -----	<b>Title of the Project and its Code</b> -----
Department Management Marketing	of &	<b>Dr. Mansour Murad</b> <b>(Management &amp; Marketing)</b>	An Empirical Study on the Factors Influencing Employer Decisions in Hiring and Retaining Individuals with Disabilities in the Arab World <b>(Mgt/Hiring/349)</b>
Department Management Marketing	of &	<b>Dr. Asad M. Sadi</b> <b>Dr. Salem Al-Ghamdi</b>	Franchising a Gizmo for Small-Medium Sized Enterprises (SME) Development in Industrialized Economies: A Saudi Arabian Investigation <b>(MGT/Gizmo/366)</b>
Department Management Marketing	of &	<b>Dr. Mourad Mansour</b> <b>Dr. Mustapha Achoui</b>	Gender and Job Satisfaction among Employees in Saudi Arabia <b>(MGT/Gender/381)</b>
<b>College of Sciences</b> Chemistry		<b>Dr. Bassam El Ali</b> <b>Dr. Basel Abu Sharkh (Che)</b> <b>Dr. Mohammad Morsy</b> <b>Dr. Mohammad Fettouhi</b>	Regioselective Catalytic Hydrocarboxylation of Alkynes by Palladium Complexes. Effects of the type of Ligands and Additives. Computational Study of the Mechanisms of Reaction <b>(CY/PALLADIUM/295)</b>



Chemistry	<b>Dr. Hassan M. Badawi</b> <b>Dr. Wolfgang Forner</b>	Potential Surfaces and Vibrational Analysis of Some Halo Propanols <b>(CY/PROPONELS/297)</b>
Chemistry	<b>Dr. M. Fettouhi (Chem)</b> <b>Dr. Bassam El Ali (Chem)</b> <b>Dr. Khalil Ziq (Phys)</b>	New Group 10 Metal Complexes Based on Chelate Ligands Bearing Nitroxide Radicals. Magnetic Properties and Catalytic Performance in Oxidation Reactions of Alcohols <b>(CY/METAL/301)</b>
Chemistry	<b>Dr. Hasan Badawi (Chem)</b> <b>Dr. Abdulaziz Alsuwaiyan (Chem)</b> <b>Dr. Wolfgang Forner (Chem)</b>	Analysis of Vibrational Spectra and Ring-Puckering of Some Heterocyclic Compounds <b>CY/ROTATION/309)</b>
Chemistry	<b>Dr. Mohammed A. Al-Daous (Chem)</b>	Growth of Uniform Zeolite Layers on 3D Ordered Macroporous Anion Modified Zirconia: Synthesis, Characterization, and Catalytic Evaluation <b>(CY/Zeolite/344)</b>
Chemistry	<b>Dr. Anvarhusain Isab</b> <b>Dr. Mohammad I.M. Wazeer (Chemistry)</b>	Synthesis of Gold(III)-Diamines complexes and their Interactions with Biological Molecules Studies by solid and solution NMR <b>(CY/GOLD/374)</b>
Chemistry	<b>Dr. Bassam El-Ali</b> <b>Dr. Jimoh Tijani (Chemistry)</b>	Rhodium-Catalyzed one Pot Hydroformylation-Cyclization Reactions of Allybenzene Derivatives <b>(CY/BENZENE/379)</b>
Earth Sciences	<b>Dr. Mohammad Makkawi</b>	Groundwater Resources and Environmental Management: Industrial Experience in Modeling Groundwater Aquifers <b>(ES/GROUND-WATER/290)</b>

Earth Sciences	<b>Dr. Mahbub Husain (Release Time Proposal)</b>	Application of Trace and Rare Earth Elements (REE) in Tectonic Interpretations of the Exposed Cretaceous Wasia Formation in Al-Kharj and Riyadh Area <b>(ES/RARE EARTH/308)</b>
Mathematical Sciences	<b>Dr. Mohammad El-Gebeily Dr. Khaled Furati Dr. Hattan Tawfiq</b>	Approximating Singular ODEs by Nearby Regular Ones: Theoretical and Computational Issues <b>(MS/SINGULAR ODE/274)</b>
Mathematical Sciences	<b>Dr. Jawad Abuilhail</b>	Primeness and Coprimeness Conditions for Comodules and Corings <b>(MS/ CORINGS/296)</b>
Mathematical Sciences	<b>Dr. Mohammad Samman</b>	Some Development in Near-Ring Theory (Sabbatical leave proposal) <b>(MS/NEAR-RING/314)</b>
<b>College / Department</b> -----	<b>Principal Investigator / Co-Investigator(s)</b> -----	<b>Title of the Project and its Code</b> -----
Mathematical Sciences	<b>Dr. Naser-Eddine Tatar Dr. Mohammad R. Alamia</b>	Stabilization of a Partially Viscoelastic Material <b>(MS/VISCO/326)</b>
Mathematical Sciences	<b>Dr. Hassan Muttalak (Math) Mr. Marwan Al-Momani Mr. Mohammad Saleh</b>	Estimating $P(Y < X)$ Using Ranked Set Sampling in Case of the Exponential Distribution <b>(MS/Set-Sampling/330)</b>
Mathematical Sciences	<b>Dr. Abdeslem Lyaghfour (Math)</b>	On the Continuity of the Free Boundary in a Class of Elliptic Free Boundary Problems with Neumann Boundary Condition <b>(MS/Neumann/333)</b>
Mathematical Sciences	<b>Dr. Salim Messaoudi (Math)</b>	General Decay in Viscoelastic Damped Equations <b>(MS/Decay/334)</b>

Mathematical Sciences	<b>Dr. Ibrahim Rahimov (Math)</b>	Functional Limit Theorems for Branching Stochastic processes with Time-Dependent Immigration <b>(MS/Theorems/335)</b>
Mathematical Sciences	<b>Dr. Jawad Abuihlail (Math)</b> <b>Mr. Mohammad Jarar (Math)</b>	The Structure of Tilting Modules Over Commutative Rings <b>(MS/Rings/351)</b>
Mathematical Sciences	<b>Dr. Abdulrahman Alshuaibi (Math)</b>	Regularization and the Inverse Laplace Transform (Sabbatical leave proposal) (Host Institute: University of West Georgia, USA) <b>(MS/Laplace/354)</b>
Mathematical Sciences	<b>Dr. Kassem Mustapha (Math)</b>	An Alternative Direction Implicit Quadrative Petrov-Galerkin Method for Solving a Class of Time-Dependent Problem <b>(MS/QUADRATIVE/356)</b>
Mathematical Sciences	<b>Dr. Qamrul Hasan Ansari</b> <b>Dr. Soliman Alhomidan (Math)</b>	Multiobjective Optimization and Vector Variational Inequalities <b>(MS/VECTOR/357)</b>
<b>College / Department</b> -----	<b>Principal Investigator / Co-Investigator(s)</b> -----	<b>Title of the Project and its Code</b> -----
Mathematical Sciences	<b>Dr. Abdul Rahim Khan</b> <b>Dr. Soliman Alhomidan</b> <b>Dr. Qamrul Hasan Ansari</b> <b>Mr. Shamsuddeen Khan</b>	Iterative Methods for Solving Variational Inequalities with Applications <b>(MS/Applications/362)</b>
Mathematical Sciences	<b>Dr. Said Berrimi (DCC)</b> <b>Dr. Salim Messaoudi</b>	Study of Decay in Some Thermoelastic Systems <b>(MS-DCC/Decay/360)</b>
Mathematical Sciences	<b>Dr. Salah-Eddine Kabbaj</b>	Trivial Ring Extensions Defined by Gaussian Conditions <b>(MS/Ring/368)</b>
Mathematical Sciences	<b>Dr. Salah-Eddine Kabbaj</b>	Subalgebras of Affine Domains Over a Noetherain Domain <b>(MS/Domain/369)</b>

Mathematical Sciences	<b>Dr. Rajai Al-Assar</b>	Transient Inviscid Flow Past Two Cylinders <b>(MS/Inviscid/375)</b>
Mathematical Sciences	<b>Dr. Mohammad El-Gebeily</b> <b>Mr. Shafiqur Rahman (RI)</b>	Wavelet and Fractal Methods for the Analysis of Meteorological Data of Saudi Arabia: Phase 2 <b>(MS/WAVELET-2/378)</b>
Physics	<b>Dr. S.M. Al-Amoudi</b> <b>Dr. H. Bahlouli</b>	Real-Time Dynamics of Bose-Einstein Condensates <b>(PH/BOSE/241)</b>
Physics	<b>Dr. Abdullah Alsunaidi (Phys)</b> <b>Dr. Basel Abu Sharkh (Che)</b>	Self-Assembly in Confined Semiflexible Copolymers <b>(PH/COPOLYMERS/268)</b>
Physics	<b>Dr. G.D. Khattak (Phys)</b> <b>Dr. A. Mekki (Physics)</b>	Direct Current (DC) Conductivity Studies of Strontium-Borate Vanadate Glasses. <b>(PH/Glasses/346)</b>
Physics	<b>Dr. Mohammad Al-Kuhaili</b> <b>Dr. S.M.A. Durrani</b> <b>Dr. E.E. Khawaja (Consultant)</b>	Development of a New Method for Determining the Optical Constants (n and k) of Thin Inhomogeneous Films <b>(PH/OPTICAL/286)</b>
<b>College / Department</b> -----	<b>Principal Investigator / Co-Investigator(s)</b> -----	<b>Title of the Project and its Code</b> -----
Physics	<b>Dr. M.I. Al-Jarallah</b>	Radon Gas and Radiation Dangers (Sabbatical leave to write a book) <b>(PH/RADON GAS/315)</b>
Physics	<b>Dr. Nouar Tabet</b> <b>Dr. A. Mekki</b> <b>Dr. K. Mezghani (Mech Engg.)</b>	DC-Magnetron Sputtering Synthesis and Characterization of the Physical Properties of Zinc Oxide Thin Films <b>(PH/DC-MAGNETRON/299)</b>
Physics	<b>Dr. A.A. Naqvi (Phys)</b> <b>Dr.M.M. Nagadi (Phys)</b> <b>Dr. Omar Al-Amoudi (CE)</b> <b>Dr. M. Maslehuddin (RI)</b>	Measurement of Chloride Concentration in Silica Fume and Fly Ash Cement Concretes Using PGNAA Technique <b>(PH/FLY ASH/305)</b>

Physics	<b>Dr. S.M.A. Durrani (Phys)</b> <b>Dr. M.F. Al-Kuhaili (Phys)</b> <b>Mr. B.J. Abdul-Aleem (ME)</b>	Cerium Oxide Tin Film Gas Sensor for Monitoring of Carbon Monoxide <b>(PH/CERIUM/355)</b>
Physics	<b>Dr. A.K. Aksoy (Physics)</b> <b>Mr. Mohammad Raashid (Physics)</b>	Enhancement of Technical Capability of the 14 MeV FNAA Facility at KFUPM <b>(PH/FNAA Facility/357)</b>
Physics	<b>Dr. Khalil Ziq</b> <b>Mr. A. Ghannam</b> <b>Mr. A.F. Salem</b>	Magnetic Properties of ZnO-TM Semiconductor <b>(PH/Magnetic/364)</b>
Physics	<b>Dr. Abdullah Alsunaidi</b>	Dynamics and Morphology of Phase Separating Liquid-Crystal/Polymer Blends <b>(PH/Crystal/382)</b>
Physics	<b>Dr. Abdulaziz Aljalal</b> <b>Dr. Ibrahim Nasser</b> <b>Mr. Khateeb-ur-Rahman</b>	Manual Editing entitled General Physics: Multiple-Choice Questions: Waves, Thermodynamics, Electricity and Magnetism <b>(PH/Multiple Questions/384)</b>
<b>College / Department</b> -----	<b>Principal Investigator / Co-Investigator(s)</b> -----	<b>Title of the Project and its Code</b> -----
<b>College of Environmental Design</b> Architecture Department	<b>Dr. Rabee Reffat (ARC)</b> <b>Dr. Emad El-Sebakhy (ICS)</b>	A Semantic Based Virtual Design Environment for Digital Designing in Architecture <b>(ARC/SEMANTIC/311)</b>
Construction Engineering & Management Dept.	<b>Dr. Mohammad Al-Khalil</b>	<b>The Value Engineering Experience at Saudi Aramco</b> <b>(CEM/VALUE ENG/276)</b>
City & Regional Planning Dept.	<b>Dr. Adel Aldosary</b> <b>Mr. Syed Masiur Rahman</b>	<b>Localization in Saudi Arabia: Social and Economic Perspectives</b> <b>(CRP/Localization/353)</b>

Architecture Department	<b>Dr. Hamoud Dehwah (ARE)</b> <b>Dr. Mohd. Maslehuddin (RI)</b> <b>Dr. Omar B. Al-Amoudi (CE)</b>	Optimization of Mix Design and Durability of Self-Compacted Concrete <b>(ARE/Concrete/343)</b>
<b>College of Industrial Management</b> Department of Management & Marketing Department of Management & Marketing	<b>Dr. Mohammad Bureay</b>  <b>Dr. Muhammad A. Sadi</b> <b>Dr. Mohammad Al-Bureay</b>	Islamic Management and Administration <b>(CIM/ISLAMIC MGT/289)</b>  <b>An Examination of Saudization Policy in the Service Sector: The Replacement of Foreign Workers with Locals in Saudi Arabia</b> <b>(CIM/Saudization/339)</b>

#### **4. RESEARCH PROPOSALS UNDER REVIEW**

##### **SUBMITTED IN 2005-2006**

#	Name of Faculty & Department	Title of Research Proposal
1.	Dr. Zain Yamani (Phys) Dr. M.A. Gondal (Phys) Mr. Talib Husain (Phys)	Laser Induced Breakdown Spectrometer for Trace Element Analysis.
2.	Dr. Ahmed Z. Algarni Dr. Ayman H. Kassem (Aerospace Engg.)	A Toolbox for Remote-Sensing-Satellite Mission-Analysis and Design
3.	Dr. Abdullah Alsunaidi (Phys) Dr. H. Bahlouli (Phys)	Dynamics and Morphology of Phase Separating Liquid-Crystal/Polymer Blends

##### **2006-2007**

#	Name of Faculty	Department	Title of the Research Proposal
IP-2007-03	Dr. Imad Jabir, Asst. Prof.,	Finance & Economics	Preparation for the End of the Fossil Fuel Era Duration: 12 months Budget: SR. 15,000
IP-2007-04	Dr. Imad Jabir, Asst. Prof., and Mr. Lurion Demello, Lecturer.,	Finance & Economics	Asymmetric Adjustment Towards Long-Run Equilibrium of the U.S. GDP and Energy Consumption Duration: 12 months Budget: SR. 33,400
IP-2007-07	Dr. Amjad Khalil and Dr. Abdulhafez Selim	Physics Physics	Isolation and Characterization of Thermostable Enzymes (Amylases, Lipases and Glucosidases) from Thermophilic Bacteria Isolated from Desert Sand and Hot Spring in Saudi Arabia for Industrial Applications Budget: SR. 65,400 Duration: 18 months
IP-2007-13	Dr. Sadiq Sohail	Management & Marketing	IT Outsourcing in Saudi Arabia: Perspectives from Employees Duration: 12 months Budget: SR. 54,300
IP-2007-16	Dr. T.M. Mustafa Dr. H. Azad	Mathematical Sciences Math. Sci	Symmetry Analysis of Some Nonlinear Klein-Gordon Equations on Sphere Duration: 20 months Budget: SR. 76,500

<b>IP-2007-17</b>	Dr. Kassem Mustapha	Mathematical Sciences	An Alternative Direction Implicit Quadrature Petrov-Galerkin Method for Solving a Class of Time-Dependent problem Duration: 12 months Budget: SR. 39,900
<b>IP-2007-27</b>	Dr. Ismail Budaiwi Dr. Adel Abdou Dr. Maatouk Khoukhi	Architectural Engineering Dept.	The Impact of Moisture Content on the Thermal Conductivity of Fibrous Insulation Materials Duration: 18 months Budget: SR. 104,500
<b>IP-2007-31.</b>	Dr. Mohammad Hawwa	Mechanical Engg.	Ultrasonic Characterization of Inhomogeneous Cladded Plates Duration: 12 months Budget: SR. 29,100
<b>IP-2007-35.</b>	Dr. H.M. Masoudi Dr. M.A. Gondal Dr. E. Hegazi Dr. J. Pola (Consultant )	EE Dept. Physics Physics Consultant from Czech Republic	Laser Approach to Metal Nanoalloys, Its Optimization and Search for Novel Alloy Nanostructures Duration: 36 months Budget: 1,191,900
<b>IP-2007-41.</b>	Dr. Mahmoud O. Elish,	ICS Dept.	Object-Oriented Software Maintainability Forecasting Models Based on Computational Intelligence: Methodology and Applications Duration: 28 months Budget: SR. 195,000
<b>IP-2007-43.</b>	Dr. Muhd. Mudawar Dr. A. Bou-haraoua, Dr. Abdulrahim Nasser	Computer Engg. Computer Engg., Computer Engg.	The Design and Simulation of a Multicore Vector Processor Duration: 24 months Budget: SR. 232,800
<b>IP-2007-44.</b>	Dr. Chawki Fedjki Dr. Salih Duffuaa	Systems Engg. (Asst. Prof) Systems Engg. (professor)	Heuristics for QAP Using a New Characterization of a Local Star Minimum Duration: 18 months Budget: SR. 86,800
<b>IP-2007-45.</b>	Dr. Roland Kok-Kheng Yeo	Mgt. & Mkt.	Corporate Image and Reputation of Large Commercial Banks in Saudi Arabia: An Exploratory Study Duration: 12 months Budget: SR. 61,300



<b>IP- 2007- 47.</b>	Mr. Syed Arshad Raza, Dr. Sadiq Sohail and Mr. Muhammad Fareed	Lecturer, Acct. & MIS  Mgt. & Mkt.  Electrical Engineering	Development of a Neural Network based Predictive Model for Revealing Customers' Perceptions of Foreign Products in Saudi Market Duration: 18 months Budget: SR. 83,600
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**PROPOSALS SUBMITTED UNDER JUNIOR FACULTY RESEARCH GRANTS**  
**DURING THE ACADEMIC YEAR 2006-2007**

#	Name of Faculty	Department	Title of the Research Proposal
1.	Dr. Salem A.S. Al-Dini, Dr. Bekir S. Yilbas, (Consultant) (JFRP-2007-01)	Mechanical Engg. Mechanical Engg.	Formulation of Entropy Generation in Micro-Channel Flow: Flow Between Micro-Channel Formed by Parallel Plates: A Case study. Duration 11 months Budget: SR. 50,000
2.	Dr. Abdulrahman M. Jarad (JFRP-2007-02)	Earth Sciences Department	Univariate and Bivariate Statistical Analyses of the $P_2O_5$ , $Al_2O_3$ , $MgO$ , $SiO_2$ , $Fe_2O_3$ and $U_3O_8$ in the Thanyat Turayf Phosphorite Deposits, Sirhan-Turayf Sub-basin, NW Saudi Arabia Duration: 11 months Budget: SR. 45,200
3.	Dr. Samir Al-Ghadiban (JFRP-2007-03)	Electrical Engg.	Uplink MIMO Scheduling Design and Evaluation for V-Blast Users Duration: 11 months. Budget: 38,500
4.	Dr. Ebrahim Malalla, Asst. Prof. (JFRP-2007-04) Dr. Naser Darwish (Consultant)	ICS Dept.	Open Addressing Hashing Schemes with Constant Worse-Case Search Time Duration: 11 months. Budget: 50,000
5.	Dr. Mohammad Yousef Dr. F.D. Zaman (Consultant)	Math Dept.	PDE Approach for Valuation of Complex Derivative Securities under Stochastic Volatility Duration: 11 months Budget: SR. 38,000
6.	Dr. J.H. Mutawa Dr. B. Chanane (Consultant)	Math Dept.	Identification of Nonlinear State Space Model with Observation Outliers Based on Leave-K-Out Diagnostics Duration: 12 months Budget: SR. 43,500
7.	Dr. Mohammad Eleiche Dr. K. Faisal (Consultant)	ICS Dept.	Metrics-based Identification and Characterization of Change Prone Packages in Object-Oriented Designs Duration: 11 months Budget: SR. 45,000
8.	Dr. Lahouri Ghouti Dr. A. Zerguine (Consultant)	ICS Dept. EE Dept.	Fingerprint Images: A powerful Tool for Biometric Authentication
9.	Dr. Khalid Al-Ramadan Dr. Muhittin Senalp (Consultant, Sadi Aramco)	Earth Sciences	Unravelling the Digenetic Alterations and Related Reservoir Quality Evolution Along Sequence Boundaries of the Siliciclastic Deposits Duration: 12 months Budget SR: 50,000

<b>10.</b>	Dr. Abdulaziz Abdulrahman Sadi (JFRP-2007-10) Consultant: Dr. Hassan Badawi, Chemistry	Chemistry	Ab Initio and DST Investigation of the Molecular Structure and Vibrational Spectra of Silacyclopent-3-Enes Duration: 11 months Budget: SR. 53,950
<b>11.</b>	Dr. Obaid Al-Shuridah. Consultant: Dr. Alhassan Abdulmuhmin, CIM.	Management & Marketing	Factors Influencing Attitude and Intention to Use Internet Banking in Saudi Arabia Duration: 11 months Budget: SR. 47,400
<b>12.</b>	Dr. Nu'man Abu-Dhier	Mechanical Engg.	Vibration-Assisted Arc Welding of Oil-Pipes Steel Duration: 11 months Budget: SR. 50,000
<b>13.</b>	Dr. Mamdouh Al-Harthi, Chemical Engg. Dept. Consultant: Dr. Joao Soares, University of Waterloo, Canada	Chemical Engg.	Mathematical Modeling and Experimental Studies of Atom Transfer Radical Copolymerization Duration: 11 months Budget: SR. 50,000

**5. BOOK-WRITING PROPOSALS SUBMITTED FOR FUNDING**  
**WHICH ARE UNDER REVIEW**

#	Name of Faculty	Department	Title of the Research Proposal
1	Dr. Smail Bezzazi, ELC Director,	Hail Community College	Reading Brainwaves 2 ISBN # 9960-9815-0-9
2.	Dr. Ahmed Sedky Budget: SR. 42,000, including SR. 20,000 as copyright fee to be paid to the publishers for 100 copies). Duration: 13 months.	Architecture Dept.	An Introduction to Area Conservation in the Arabic-Islamic City Publishers: Intellect Book Publishers, PO Box 862, Bristol BS99 1DE, UK (email: <a href="mailto:Masoud@intellectbooks.co.uk">Masoud@intellectbooks.co.uk</a> )

## 6. SABBATICAL LEAVE PROPOSALS RECEIVED FOR 2007/2008

#	Name of Faculty	Department	Title of the Research Proposal
1	Dr. Habib Al-Ali	Chemical Engineering	Title: Cost Effective and Optimum Strategies for Emission Reduction in Refineries Host Institute: University of Waterloo, Waterloo, Canada. Sabbatical year: 2007-08
2.	Dr. Abdulwahab A. Abokhodair	Earth Sciences	Title: Numerical Tools for Geoscience Computations Host Institute: Department of Geology, UAE University, UAE Sabbatical year: 2007-2008 Budget: SR. 33,500
3.	Dr. Abdulaziz Al-Shuaibi	Mathematical Sciences Dept.	Title: Regularization and the Inverse Laplace Transform Host Institute: University of West Georgia, USA. Sabbatical year: 2007-08 Budget: SR.

**7. SABIC AND FAST TRACK PROPOSALS RECEIVED FOR FUNDING DURING  
NOVEMBER/DECEMBER 2006 FOR FUNDING**

<b>S. No.</b>	<b>Name of Faculty</b>	<b>Department</b>	<b>Title of the Proposal</b>
<b>SF-2007-01</b>	Dr. M.A. Gondal Dr. Abdulrahman Al-Arfaj Dr. Z.H. Yamani	Physics Chemistry Physics	Laser-Induced Photo-Catalytic Degradation of Phenol Using Different Semiconductor Catalysts
<b>SF-2007-02</b>	Dr. Bekir Sami Yilbas Dr. Shahzada Z. Shuja Dr. Shafiq M. A. Khan Mr. Abdul Aleem, B.J.	Mech. Engg. Mech. Engg. Mech. Engg. Mech. Engg.	Surface Improvement of Cemented Carbide Cutting Tool: Method of Laser Treatment
<b>SF-2007-03</b>	Dr. Abul Fazal M. Arif Dr. Anwar K. Sheikh	Mech. Engg. Mech. Engg.	Effect of Billet Quality on the Hot Extrusion Die Life
<b>SF-2007-04</b>	Dr. Abul Fazal M. Arif Dr. Bekir Sami Yilbas	Mech. Engg. Mech. Engg.	Numerical and Experimental Investigation of Thermal Stress Development During Laser Cutting of Sheet Metal
<b>SF-2007-05</b>	Dr. Iyad Al-Zaharnah Dr. Saif Al-Kaabi Dr. Bekir Sami Yilbas	Mech. Engg. Mech. Engg. Mech. Engg.	Flexural Behavior of a Cantilever Plate During the Welding Process
<b>SF-2007-06</b>	Dr. A. Mimouni	Math. Sciences	Ratliff-Rush Closures of Ideals in Integral Domains
<b>SF-2007-07</b>	Dr. Salim Messaoudi and two others from outside the University.	Math. Sciences	Uniform Stabilization in Systems of Non-Classical Thermo-elasticity
<b>SF-2007-08</b>	Dr. Ali Hussein Muqaibel Mr. Omar Johar	Electrical Engg. Electrical Engg.	Directional UWB Channel Characterization
<b>SF-2007-09</b>	Dr. Mohammad Nahid Siddiqui	Chemistry	Investigating the Reactivity Behavior of Arabian Asphaltenes
<b>SF-2007-10</b>	Dr. Jaafar H. Al-Mutawa Dr. Fouad Al-Sunni	Math. Sciences Systems Engg.	Identification of Errors in Variables Model with Observation Outliers
<b>SF-2007-11</b>	Dr. Husain A. Al-Jamid Mr. Mohd. Zaheed Khan	Electrical Engg. HFCC College	Analysis of Full-Vectorial Three Dimensional Optical Waveguides with Multiple Longitudinal Discontinuities Using Pade Approximants
<b>SF-2007-12</b>	Dr. Ashraf Elazouni Dr. Mohammad Abido	CEM Dept. Electrical Engg.	Finance-based Scheduling of Multiple Simultaneous Construction Projects

<b>SF-2007-13</b>	Dr. Maatouk Khoukhi	Architectural Engg.	The Use of Desiccant Cooling System Coupled to Solar Collector in the Kingdom of Saudi Arabia: Feasibility Study
<b>SF-2007-14</b>	Dr. H.E. Emara-Shabaik Dr. M.A. Habib	Systems Engg. Mech. Engg.	Dynamics of Drum Boiler with Non-Uniform Heat Flux Distribution
<b>SF-2007-15</b>	Dr. Ahmad Z. Al-Garni Dr. Farooq Saeed	Aerospace Eng Aerospace Eng.	Aerodynamic Performance and Directional (Yaw) Stability Analysis of Delta and Double-Delta Wing Configurations
<b>SF-2007-16</b>	Dr. Farooq Saeed Dr. Ahmad Z. Al-Garni Mr. Ahmad Jamal	Aerospace Eng. Aerospace Eng. Aerospace Eng.	Numerical Modeling and Investigation of Novel Design Arrangements for Improving Surface Heat Transfer From an Aircraft Hot air Anti-Icing System
<b>SF-2007-17</b>	Dr. Abdul-wahid A. Saif Dr. Moustafa El-Shafei Dr. M.A. Habib	Systems Engg. Systems Engg. Mech. Engg.	Estimation of Quality of Reduction Iron in Direct Reduction Furnaces
<b>SF-2007-18</b>	Dr. Mazen Khaled Dr. Bekir Sami Yilbas Dr. Omar Al-Amoudi	Chemistry Mech. Engg. Civil Engg.	Surface Modification of Steel by HVOF for Corrosion Protection in Simulated Concrete Pore Environment.
<b>SF-2007-19</b>	Dr. A.A. Isab Dr. M.I.M. Wazeer	Chemistry Chemistry	Solid and Solution NMR Studies of $^{113}\text{Cd}$ and $^{199}\text{Hg}$ Complexes with the Constituents of DNA and Proteins
<b>SF-2007-20</b>	Dr. Hassan A. Muallem Dr. Shaikh Asrof Ali	Chemistry Chemistry	Synthesis of Polyisoxazolidines: A Novel Class of Polymers for Inhibition of Mild Steel Corrosion
<b>SF-2007-21</b>	Dr. Salahaddin Mohammad Dr. Emad El-Sebakhy Dr. Abdulhafez Selim	ICS Dept.  ICS Dept. Biophysics Dept.	Prediction of Relative Solvent Accessibility of Residues in Proteins Using Data Mining Framework: As an Application in Bioinformatics
<b>SF-2007-22</b>	Dr. Jauhar Ali Dr. Sahalu Junaidu Mr. Saquib Razak	ICS Dept. ICS Dept. ICS Dept.	A Visualization Tool for Basic ICS Courses Allowing Students to Visualize Data Structures
<b>SF2007-23</b>	Dr. Samir Al-Ghadban Dr. Salam Zummo	EE Dept. EE Dept.	New Adaptive Schemes for Wireless Networks Based on Multi-Layer Space-Time Transmission
<b>SF-2007-24</b>	Dr Salam Zummo	Elec. Engg.	Performance of Forward Error Correction in Wireless Ad Hoc Networks

<b>SF-2007-25</b>	Dr. A. Abulkibash	Chemistry	Determination of pH Using Sequential Injection Analysis Combined with Differential Electrolytic Potentiometry
<b>SF-2007-26</b>	Dr. Mohammad Youssef Dr. Salem Alghamdi	Mgt & Mkt Mgt & Mkt.	Chain Management Practices and Its Impact on the Competitive Advantage of Saudi Arabian Companies
<b>SF-2007-27</b>	Dr. Anwar Khalil Sheikh Mr. Ahmed Mohiuddin	Mechanical Eng Mechanical Eng.	Quality Assurance in Submerged Arc Welding (SAW)
<b>SF-2007-28</b>	Dr. Maan Kousa Dr. Sadiq Sait Mr. Ahmar Shafi Mr. Ajmal Khan	Electrical Engg. Computer Eng. Electrical Eng. Electrical Eng.	Investigation and Performance Evaluation of IP Telephony (IPT) and Voice over IP (VoIP) in University Network
<b>SF-2007-29</b>	Dr. Hussain Alzaher Mr. Noman Tasadduq	Electrical Eng. Electrical Eng.	An Integrable 60 Hz Notch Programmable Filter
<b>SF-2007-30</b>	Dr. Mohammad Abido	Electrical Engg.	Optimal Power Flow Using Multiobjective Particle Swarm Optimization
<b>SF-2007-31</b>	Dr. Wasfi Al-Khatib Dr. L. Cheded	ICS Dept. Systems Engg.	Detection of Q/A Segments in Arabic Audio Lectures
<b>SF-2007-32</b>	Dr. Salem Al-Ghamdi Dr. Mohammed Youssef	Mgt & Mkt Mgt & Mkt	Influence of Commitment and Islamic Ethics on Organizational Change
<b>SF-2007-33</b>	Dr. Mehmet Sunar Dr. Lahouari Cheded	Mechanical Eng Systems Eng.	Application of Wavelet Techniques to Vibration Analysis of Rotating Machinery
<b>SF-2007-34</b>	Dr. M.H. Shwehdi Dr. Jamil Bakhashwain Mr. Umar Johar	Electrical Engg. Electrical Engg. Electrical Engg.	Investigating the Influence of KFUPM Personal Computers Processing Modes on Line Current Harmonics and Harmonic Content
<b>SF-2007-35</b>	Dr. Uthman Baroudi	Computer Engg.	Cross-Layer Optimization for Ad Hoc Wireless Networks



<b>SF-2007-36</b>	Dr. Uthman Baroudi Mr. Saquib Razzaq	Computer Engg. ICS Dept.	Characterizing Link Behavior over Wireless Ad Hoc Networks
<b>SF-2007-37</b>	Dr. Uthman Baroudi	Computer Engg.	Cross-Layer Optimization for Wireless Sensor Networks
<b>SF-2007-38</b>	Dr. Ahmet Z. Sahin Dr. Syed M. Zubair	Mechanical Eng Mechanical Eng.	Exergy Analysis of Process Heaters
<b>SF-2007-39</b>	Dr. Esmail Mokheimer Dr. Hassan M. Badr	Mechanical Eng Mechanical Eng	Validity of Computational Models for Simulation of Heat Transfer in Ground Heat Exchangers
<b>SF-2007-40</b>	Dr. Abul Kalam Azad Dr. Shamshad Ahmad	Civil Engg. Civil Engg.	Post-Initiation Corrosion State of Reinforced Concrete: A Phenomenological Study
<b>SF-2007-41</b>	Dr. Kassem Mustapha	Mathematical Sciences	An Efficient Numerical Solution for Semi-Linear Fractional Order Partial Differential Equations
<b>SF-2007-42</b>	Dr. A.R. Khan Dr. N. Hussain (KAAU)	Mathematical Sciences	Coincidences and Approximation of Non-Commuting Multi-Valued Maps with Applications
<b>SF-2007-43</b>	Dr. Khalid Masood Dr. Muhammad Tahir Mustafa	Math. Sciences Math. Sciences	Investigation and Regularization of Initial Inverse Heat Conduction Problem in Two Dimensions by total Variation and Spline Methods
<b>SF-2007-44</b>	Dr. Nasser-eddine Tatar	Math. Sciences	New Families of Relaxation Functions in Viscoelasticity
<b>SF-2007-45</b>	Dr. Mohammad H. Umar Dr. Anwar Joarder	Math. Sciences Math Sciences	A Study of the Bivariate Unit-Gamma LogNormal (BUGL) Distribution

<b>SF-2007-46</b>	Dr. Salim Messaoudi Dr. Nasser-eddine Tatar	Math. Sciences Math. Sciences	Critical Exponent for a Viscoelastic Problem in $R^N$
<b>SF-2007-47</b>	Dr. Qamar Hasan Ansari Dr. Soliman Alhomidan	Math. Sciences Math Sciences	Vector Quasi Equilibrium Problems and Their Applications
<b>SF-2007-48</b>	Dr. H.M.S. Bahidarah	Mechanical Engineering	Numerical Investigation on Flow Fluid and Heat Transfer Characteristics of Converging-Diverging Shape Edge-Shaped Wavy-Channels
<b>SF-2007-49</b>	Dr. Hanafy Omar Dr. Mohammed Abido	Aerospace Eng Electrical Eng.	Optimal Design of Fuzzy-based Guidance Law for Homing Missiles with Noisy Measurements Using Multi-Objectives Evolutionary Algorithms

## **8. PUBLICATIONS IN REFEREED JOURNALS REPORTED AFTER JANUARY, 2007**

### **College of Engineering**

#### **Civil Engineering**

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### College of Sciences

#### Chemistry Department

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5. "Catalytic regioselective hydrocarbonylation of Alkynes by Palladium and phosphine", **Jimoh Tijani, Rami Suleiman, Mohammad Morsy and Bassam El Ali**, Conference and Exhibition on Catalysis in GCC Countries: Innovations in Catalysis Research and Applications, Kuwait, Kuwait, December 10 – 13, 2006.
6. "Oxo Aldehydes by modified Oxo process: Rhodium Catalyzed Biphasic Hydroformylation of Alkenes", **Jimoh Tijani, Rami Suleiman, Mohammad Morsy and Bassam El Ali**, Chemindex International Conference, Manama, Bahrain, March 26-28, 2007.
7. "Differential Electrolytic Potentiometry As Detector in Flow Injection and Flow/Sequential Injection Analysis", **A.M.S. Abulkibash, T.A. Saleh and S.M. Fraihat**, National Chemistry Conference, Um Al-Qura University, Mekkah, 15-17 April 2007.
8. "Spectroscopic and ab initio studies on the conformations and intramolecular hydrogen bonding of 2-indanol", **Abdulaziz A. Al-Saadi, Martin Wagner and Jaan Laane**, The Fall 2006 Joint Meeting of the Texas Section of the American Physical Society (APS), University of Texas at Arlington, Arlington, Texas, USA, 7 October 2006.
9. "Thermodynamics of Solution of Non-Mesomorphic Solutes in the p-n-hexyl-p'-cyanobiphenyl (6CB) Liquid Crystal Solvent", **G.A. Oweimreen**, oral presentation, The 12<sup>th</sup> International Symposium on Solubility Phenomena and Equilibrium Proceses, TU Bergakademie Freiberg, 23-28 July, 2006, Freiberg, Germany.

#### Department of Mathematics and Statistics

1. "Elliptic problems with time-fractional dynamic boundary conditions", Workshop on Partial Differential Equations in Modern Physics and Applied Mathematics", **Tatar, N.**, King Abdulaziz City for Science and Technology, Riyadh, (Feb. 13, 2007).
2. "Symmetry solutions for some nonlinear partial differential equations", Workshop on Partial Differential Equations in Modern Physics and Applied Mathematics", **Zaman, F.D.**, King Abdulaziz City for Science and Technology, Riyadh, (Feb. 13, 2007).
3. "On the uniform decay in a semilinear Integro-differential elastic equation", **Messaoudi S.A. and Nuha A. Al-Jebr**, the Third Saudi Science Conference, Riyadh, (March 13, 2007).
4. "Fractional derivatives and viscoelasticity, Third Saudi Science Conference", **N. Tatar**, King Saud University, Riyadh, (March 10-13, 2007).

5. “Stabilizing systems with fractional damping, The Second Biannual Conference on Modeling, Simulation and Applied Optimization”, **N. Tatar**, ICMSAO, The Petroleum Institute, Abu-Dhabi, UAE, (March 24-27, 2007).
6. “General Decay of solutions of a semilinear viscoelastic equation”, **Messaoudi S.A.**, Workshop on PDE’s in Modern Mathematical Physics and Applied Mathematics, KACST, Riyadh, (Feb., 13, 200).
7. “Decay in viscoelastic system of Timoshenko-type”, **Messaoudi S.A.**, the Second International Conference on Modeling, Simulation and Applied Optimization (ICMSAO-07), Abu Dhabi, (March 25-27, 2007).
8. “Frictional versus viscoelastic damping for Timoshenko-type systems”, **Messaoudi S.A. and Guesmia A.**, the Fifth UAE Math Days, Etissalat University College, Sharjah, (April 28-29, 2007).
9. “Application of orthogonal exponential zero-interpolants in optimal control problems”, **Bokhari, M.A. and Sadek, I.**, Second International Conference on Modeling Simulation and Applied Optimization, Abu-Dhabi, UAE, [CD-ROM: Talk# 55], (2007).
10. “Finite element approximation of a Ladyzhenskaya model for viscous flow in streamfunction form”, **Fairag, F.**, Proceeding Conference on Numerical Methods for Fluid Dynamics CD of ICFD, University of Reading, Reading, UK, (2007).
11. “Students’ perception of their readiness versus their ‘True’ performance in pre-calculus algebra examination”, **Dr. Yushau, B. and Omar, M.**, in third proceedings of the Middle East Teachers of Mathematics, Science and Computing (MetsMac-3), (March 2007).
12. “Positive solutions of differential equations with integral boundary conditions”, **Boucherif, A.**, King Abdulaziz City for Science and Technology, Riyadh, (May 30, 2007).
13. “Topological properties of Delta-open Sets” **Latif, R.M.**, Sixth Italian-Spanish Conference on General Topology and Applications, University of Padova, Bressanone, Italy, (June 26-29, 2007).
14. “On a finer topological space than  $t_q$  and some maps,” **Latif, R.M.**, Sixth Italian-Spanish Conference on General Topology and Applications, University of Padova, Bressanone, Italy, (June 26-29, 2007).
15. “On the Smoothing of Crank-Nicolson Method and Higher order Methods for Pricing Barrier Options under Stochastic Volatility”, **Yousuf, M.**, 6<sup>th</sup> International Congress on Industrial and Applied Mathematics, Zurich, Switzerland, (July 16 – 20, 2007).

1. "Response Calibration of a PGNAA Setup using Silica fume cement Samples", **Naqvi A. A., M. M. Nagadi**, O.S. B. Al-Amoudi<sup>2</sup> and M. Maslehuddin;. Paper presented in Third Saudi Science Conference held on March 10-13, 2007 at King Saud University, Riyadh, Saudi Arabia
2. "<sup>2</sup>Response Tests of a <sup>3</sup>H(p,n) Reaction based Moisture Measurements Setup- a Monte Carlo Study", **Naqvi A. A. , M. S. Abdelmonem**, Hanan Al-Ghamdi and Ghada Al-Misned. Paper presented in Third Saudi Science Conference held on March 10-13, 2007 at King Saud University, Riyadh, Saudi Arabia
3. "Elemental Analysis of Blended Cement Samples using PGNAA Technique", **Naqvi A. A., M. M. Nagadi**, M. Maslehuddin and O.S B. Al-Amoudi;. Paper presented in Third Saudi Science Conference held on March 10-13, 2007 at King Saud University, Riyadh, Saudi Arabia
4. "Dose Calculation From an Accelerator-based Neutron Source in a Knee Phantom for BNCS Application", **Khalid Abdalla, A. A. Naqvi, N. Maalej and B. El-Shehat**, Paper presented in Third Saudi Science Conference held on March 10-13, 2007 at King Saud University, Riyadh, Saudi Arabia.
5. "Performance of Anti-scatter Grids in Mammography Imaging", **M. A. Al Kafi, N Maalej and A A Naqvi**. Paper presented in Third Saudi Science Conference held on March 10-13, 2007 at King Saud University, Riyadh, Saudi Arabia.
6. " Elemental Analysis of Coal Samples using PGNAA Technique", Fatima Al-Shehri, **A. A. Naqvi** and A. Ashry. Paper presented in Third Saudi Science Conference held on March 10-13, 2007 at King Saud University, Riyadh, Saudi Arabia.
7. "Sensitivities of short- lived Radioisotopes of T < 10 min by Neutron activation analysis technique at KFUPM", **Aksoy, A** , 3<sup>rd</sup> Saudi Science Conference", March 10-13 (2007) KSU, Riyadh, Saudi Arabia.
8. "Synthesis and Characterization of ZnO Nanostructures", **M. Faiz and N. Tabet**, First Sharja International Conference on Nanotechnology and its Applications, Sharja, 10-12 April, 2007.
9. "Growth of ZnO nanorods from Zn and Zn- Zn<sub>3</sub>N<sub>2</sub> films" A. Toumiat, S. Zerkout, S. Achour, **N . Tabet**, and L. Guarbous , First Sharja International Conference on Nanotechnology and its Applications, Sharja, 10-12 April, 2007.
10. "Synthesis and XRD/PL studies of pure and Sb<sub>2</sub>O<sub>3</sub> doped ZnO nanophases"N. Boulares, K. Guergouri, **N. Tabet**, C. Monty, First Sharja International Conference on Nanotechnology and its Applications, Sharja, 10-12 April, 2007.
11. "Microwave Synthesis of Nanostructured ZnO" **S. Al-Quraishi and N. Tabet**, First Sharja International Conference on Nanotechnology and its Applications,

- Sharja, 10-12 April, 2007.
12. “DC Magnetron Synthesis of Nanostructured ZnO Thin Films at High Pressure” **M. Hezam, N. Tabet, A. Mekki**, First Sharja International Conference on Nanotechnology and its Applications, Sharja, 10-12 April, 2007.
  13. “Isolation of three thermophilic bacterial strains (lipase, cellulose, and Amylase producers) from hot springs in Jordan, **Amjad Khalil**, 3<sup>rd</sup> Saudi Science Conference”, March 10-13 (2007) KSU, Riyadh, Saudi Arabia.
  14. “Determination of trace elements in arabian crude oil using laser radiations” **M. A. Gondal**, T. Hussain, and **Z.H. Yamani**, International Conference on Chemistry in Industry (CHEMINDIX 2007), Manama, Bahrain ( March 26-28, 2007).
  15. “Photocatalytic degradation of phenol from water using semiconductor catalysts irradiated with strong uv laser” **M. A. Gondal**, Z. Siddigi and M. N. Sayeed, International Conference on Chemistry in Industry (CHEMINDIX 2007), Manama, Bahrain ( March 26-28, 2007).
  16. “Detection of hazardous metals in waste water collected from plastic syringes manufacturing plant using laser induced breakdown spectrometry”, T. Hussain, **M. A. Gondal** and M.A. Baig, International Conference on Chemistry in Industry (CHEMINDIX 2007), Manama, Bahrain ( March 26-28, 2007).
  17. “High sensitive electronically modulated photoacoustic spectrometer for detection of trace gases” **M. A. Gondal** , **Z. H. Yamani**, **A. Dasatgeer** and **I. A. Bakhtiari**, International Conference on Chemistry in Industry (CHEMINDIX 2007), Manama, Bahrain ( March 26-28, 2007).
  18. “Determination of chloride content in different types of cements with Laser Induced Breakdown Spectroscopy” **M. A. Gondal** , T. Hussain, **Z. H. Yamani** and O.S.B Al-Amoudi, 3<sup>rd</sup> Saudi Science Conference , Riyadh, Saudi-Arabia (March 10-14, 2007)
  19. “Determination of elemental composition in iron slag waste using laser induced breakdown spectroscopy” **M. A. Gondal**, T. Hussain, , **Z. H. Yamani** and A. Bakari, 3<sup>rd</sup> Saudi Science Conference , Riyadh, Saudi-Arabia (March 10-14, 2007).
  20. “Influence Of Ambient Gas Pressure On Performance Of Laser- Induced Breakdown Spectrometry For Planetary Science Applications” **M. A. Gondal**, T. Hussain, , **Z. H. Yamani**, Saudi Physical Society Annual Meeting , Riyadh, Saudi-Arabia (December 16-18, 2006).
  21. Effects of Al<sub>2</sub>O<sub>3</sub> Nano-Particles on the Irreversible Properties of MgB<sub>2</sub> Superconductor **Kh. A. Ziq**, M. Shahabuddin, Intikhab A. Ansari, **A. F. Salem**, H. Kishan First Sharja International Conference on Nanotechnology and its Applications, Sharja, 10-12 April, 2007.

22. "High-temperature ferromagnetism in Fe-doped ZnO:Cu" **Kh. A. Ziq** and **Afef I. Taleb** Third Saudi Science Conference" New Horizons In Science And Their Applications " 10-13 March 2007.
23. "Non-local effects in  $TlBa_2Ca_2Cu_3O_9$  superconductor" Dalal Alshagetti and **Kh. A. Ziq**, Third Saudi Science Conference" New Horizons In Science And Their Applications, 10-13 March 2007
24. "Thermodynamic critical field Scaling of the critical current density and pinning forces in  $GdBa_2Cu_3O_7$  superconductor" **Kh. A. Ziq** and Hala AlHashem Third Saudi Science Conference" New Horizons In Science And Their Applications "10-13 March 2007
25. "On the magnetic state of  $R_{0.55}Sr_{0.45}MnO_3$ " **Kh. A. Ziq, B. Alharthi**, Third Saudi Science Conference" New Horizons In Science And Their Applications " 10-13 March 2007
26. "Hydrogenation effects on critical current density and pinning forces in  $GdBa_2Cu_3O_7$  superconductor" **Kh. A. Ziq** and Haifa Qadi Third Saudi Science Conference" New Horizons In Science And Their Applications" 10-13 March 2007.
27. "Thermodynamic Critical Field in  $MgB_2$  Superconducting Samples Doped with Ti" **A. F. Salem, K. A. Ziq, A. A. Ghannam and F. Enaya** " Third Saudi Science Conference" New Horizons In Science And Their Applications" 10-13 March 2007.
28. "Pinning forces and critical current density in Carbon doped  $MgB_2$  Superconducting" **K. A. Ziq, F. Enaya A. F. Salem, A. and A. Ghannam** Third Saudi Science Conference" New Horizons In Science And Their Applications " 10-13 March 2007.
29. Giant magnet-resistance in  $Sm_{0.55}Sr_{0.45}MnO_3$ " M. Abdelhadi and **Kh. A. Ziq** Third Saudi Science Conference" New Horizons In Science And Their Applications" 10-13 March 2007
30. "Influence of Schottky Contacts on the Sensitivity of Electron Beam Evaporated  $SnO_2$  Gas Sensors" **Al-Shukri, A.M.**, Physics & Astronomy: 229, 3rd Saudi Science Conference: New Horizons in Science and Their Applications, KSU, in Riyadh, Phys 27, March 10-13, 2007.
31. Electromagnetic Occupational Exposure Under a 132 kV Power Line, **Nabil Maalej** , Chokri Belhaj Ahmed , T. K. Abdel-Gali1 , Ibrahim O. Habiballah and Khaled Al-Soufi.. The Third Saudi Science Conference, Riyadh, March 2007.
32. The KFUPM Experience in Teaching and Training Medical Physicists in Collaboration with Local and National Hospitals in the Kingdom, **Nabil Maalej, Anan Al-Karmi, Ibrahim Al-Jarallah**. 2<sup>nd</sup> International Saudi Symposium on Medical Physics May 2007.

33. IMRT Patient Dose Verification Using Radiochromic Film, 2–D Array, and Electronic Portal Imaging Device (EPID) **Ganiyu Adeniyi Asuni, Nabil Maalej, Bela meftah.** 2<sup>nd</sup> International Saudi Symposium on Medical Physics May 2007.
34. Radiochromic Film Measurement and Monte Carlo Calculation of Surface Dose from 6 MV Beam, **Saleh A. Al-Ashrah, Nabil Maalej, Esam Eldeen Rahmatalla,** Hasan Al-Gamdi, Belal Meftah... 2<sup>nd</sup> International Saudi Symposium on Medical Physics May 2007.
35. Monte Carlo Technique for Simulating Total Skin Electron Therapy **Mamoun Zakariya Shehadeh, Mostafa Hossny Elsobky, Nabil Maalej,** 2<sup>nd</sup> International Saudi Symposium on Medical Physics May 2007.
36. Simulation and Verification of Stereotactic Radiosurgery Beam **Eyad Ali Hasan Al-Hakeem,** Uber Myola, **Nabil Maalej.** 2<sup>nd</sup> International Saudi Symposium on Medical Physics May 2007.
37. Density of States Associated with Jacobi Matrices, **H. Bahlouli,** Third Saudi Science Conference, Riyadh, 2007.

### **College of Computer Sciences and Engineering**

#### **Information & Computer Science**

1. “Visualization Taxonomy for Software Metrics,” **Ibrahim M. Al-Harazin, Muhammad Shafique, Jarallah S. Alghamdi, Muhammed Saleh Al-Mulhem,** Sixteenth International Conference on Software Engineering and Data Engineering (SEDE- 2007) Las Vegas, Nevada USA, July 9 - 11, 2007.
2. “Solving the minimum-cost constrained multipath routing with load balancing in MPLS networks using an evolutionary method,” **E. El-Alfy, S. Selim and S. Mujahid,** In Proc. of the IEEE Congress on Evolutionary Computation (CEC 2007), Singapore, Sept. 2007. Accepted.
3. “On optimal firewall rule ordering,” **E. El-Alfy and S. Selim,** In Proc. of the IEEE International Conference on Computer Systems and Applications, May 2007.
4. “A recurrent neural network for sequential estimation of examinees' knowledge state,” **E. El-Alfy and S. Jafri,** ICBL 2007, IEEE Student Track, Brazil, May 2007.
5. “A neural network approach for estimating examinees’ proficiency levels in computerized adaptive testing,” **E. El-Alfy and S. Jafri,** In Proc. of IASTED International Conference on Web-based Education (WBE’07), France, March 2007.

6. "A heuristic approach for firewall policy optimization," **E. El-Alfy**, In Proc. of IEEE International Conference on Advanced Communications Technology (ICACT'07), Republic of Korea, February 2007.
7. "Non-uniform Randomized Balanced Allocations," **E. Malalla**, in: Proceedings of the 1st International Conference on Digital Communications and Computer Applications, pp. 1-13, March 2007.
8. "Modeling and Analysis of Interrupt Disable-Enable Scheme," **Salah, K., and El-Badawi, K.**, Proceedings of the IEEE 21st International Conference on Advanced Information Networkign and Applications (AINA-07), Niagara Falls, Canada, May 21-23, 2007, pp. 1000-1005.
9. "Content-based Image Retrieval using Shape Descriptors", **Sarfraz, M. and Ridha, A.** (2007), The Proceedings of The ACS/IEEE International Conference on Computer Systems and Applications (AICCSA-07), May 13-16, 2007, in Amman, Jordan , pp. 621 – 626, IEEE Computer Society Press.
10. "A Randomized Knot Insertion Algorithm for Outline Capture of Planar Images using Cubic Spline", **Sarfraz, M. and Rashid, A.** (2007), The Proceedings of The 22th ACM Symposium on Applied Computing (ACM SAC-07), Seoul, Korea, pp. 71 – 75, ACM Press.
11. "Arabic Character Recognition using Particle Swarm Optimization with Selected and Weighted Moment Invariants", **Sarfraz, M. and Al-Awami, A.T.A.** (2007), The Proceedings of The International Symposium on Signal Processing and its Applications in conjunction with the International Conference on Information Sciences, Signal Processing and its Applications (ISSPA 2007), 12 - 15 February 2007, Sharjah, United Arab Emirates (U.A.E.), ISBN 1-4244-0779-6, IEEE Computer Society Press.
12. "A methodology for Integrating Heterogeneous Databases Using a Global Schema", **Muhammad Shafique and M. S. Al-Shashtawi**, The sixth IASTED International Conference on Communications, Internet, and Information Technology (CIIT 2007) July 2 – 4, 2007 Banff, Alberta, Canada.
13. "Infusing Critical Thinking Skill Classification into a Software Engineering Course," **Muhammad Shafique, Kanaan A. Faisal, and M. R. K. Krishna Rao**, The 2007 International Conference on Frontiers in Education: Computer Science and Computer Engineering (FECS'07: June 25-28, 2007), Las Vegas, USA
14. "Visualization Taxonomy for Software Metrics," **Ibrahim M. Al-Harazin, Muhammad Shafique, Jarallah S. Alghamdi, Muhammed Saleh Al-Mulhem**, Sixteenth International Conference on Software Engineering and Data Engineering (SEDE- 2007) Las Vegas, Nevada USA, July 9 - 11, 2007
15. "Solving the minimum-cost constrained multipath routing with load balancing in MPLS networks using an evolutionary method," **E. El-Alfy, S. Selim and S.**

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27. “Neuro-Fuzzy Inference Systems in Identifying Flow-Regimes and Liquid-Holdup in Horizontal Multiphase Flow” **Emad A. El-Sebakhy**, Yasser Shaaban, Iputu Raharja, and Yaman Khaeruzzaman, ICMSAO’ 07. Second International Conference on Modeling, Simulation and Applied Optimization, March 24 – 27, 2007. The PI, Abu Dhabi, UAE. Page(s): 217 – 225.
28. “Neuro-Fuzzy Systems Modeling Tools for Bacterial Growth” **Emad A. El-Sebakhy, S. Adam, I. Raharja, and Y. Khaeruzzaman, (2007)** AICCSA-07. 2007, the 5<sup>th</sup> ACS/IEEE International Conference on Computer Systems and Applications, AICCSA ‘2007. May 13-16, pp. 374-380, 2007, Amman, Jordan.
29. “Support Vector Machines Framework for Predicting the PVT Properties of Crude Oil Systems, **E. El-Sebakhy, T. El-Shaltami, S. Al-Bukhitan, Y. Shabaan, I. Raharja, and Y. Khaeruzzaman**, The SPE 15th Middle East Oil Show held in Bahrain, 11–14 March 2007. SPE105698.
30. “The Capability of Neuro-Fuzzy Systems in Predicting Permeability and Porosity from Well-Log” Abdulraheem, **E. El-Sabakhy, M. Ahmad, Arif Vantala, Gabor Korvin, and I. Raharja**, The SPE 15th Middle East Oil Show held in Bahrain, 11–14 March 2007. SPE105350

#### Computer Engineering Department

1. “Defect-Tolerant N<sup>2</sup>-Transistor Structure for Reliable Design at the Nanoscale,” **Aiman EL-MALEH, Bashir AL-HASHIMI, Ahmad AL-YAMANI**, 12th IEEE European Test Symposium, Freiburg, Germany, May 20-24, 2007.
2. “A Reconfigurable Broadcast Scan Compression Scheme Using Relaxation Based Test Vector Decomposition,” **Aiman EL-MALEH, Mustafa ALI, Ahmad AL-YAMANI**, 12th IEEE European Test Symposium, Freiburg, Germany, May 20-24, 2007.
3. “Functional Networks as a Novel Approach for Prediction of Permeability in a Carbonate Reservoir,” **El-Sebakhy E., Abdulraheem A., Ahmed M., Al-Majed A., Raharja P., Azzedin F., and Sheltami T.**, 10th International Conference on Engineering Applications of Neural Networks 29-31 August 2007. Thessaloniki, Hellas.
4. “Delay and Power Efficient on Voice Transmission over MANET,” **Md. Golam Kaosar, Tarek R. Sheltami, Ashraf S. Hasan Mahmoud**, to appear The IEEE International Conference on Communications (ICC 2007), Glasgow, Scotland, June24-28, 2007.

5. "Power and Delay Analysis of The WEAC Protocol Based MANET Under Video Transport," **Asif Hafiz and T. Sheltami**, The IEEE 21st International Conference on Advanced Information Networking and Applications (AINA-07), Niagara Falls, Canada, May 21-23, 2007, pp 15-22.
6. "Coding Erasures with Cooperative Diversity for wireless Ad Hoc Networks", **Hazem Selmi and Uthman Baroudi**, the Second International Conference on Modeling, Simulation and Applied Optimization (ICMSAO-07), March 24-27, 2007.
7. "EQOSA: Energy and QoS Aware MAC for Wireless Sensor Networks," **Uthman. Baroudi**, submitted to the 20<sup>th</sup> International Symposium on Signal Processing and its Applications (ISSPA 2007), Feb. 12-15, 2007.
8. "Utilizing Extension Character 'Kashida' With Pointed Letters For Arabic Text Digital Watermarking", **Adnan Gutub, Lahouari Ghouti, Alaaeldin Amin, Talal Alkharobi, and Mohammad K. Ibrahim**, International Conference on Security and Cryptography - SECRYPT, Barcelona, Spain, July 28 - 31, 2007.
9. "Novel Arabic Text Steganography Method Using Letter Points and Extensions", **Adnan Gutub and Manal Fattani**, WASET International Conference on Computer, Information and Systems Science and Engineering (ICCISSE), Vienna, Austria, May 25-27, 2007.
10. "Parallelizing GF(P) Elliptic Curve Cryptography Computations for Security and Speed", **Adnan Gutub, Mohammad Ibrahim, and Turki Al-Somani**, IEEE International Symposium on Signal Processing and its Applications in conjunction with the International Conference on Information Sciences, Signal Processing and their Applications (ISSPA), Sharjah, United Arab Emirates, February 12-15, 2007.

#### Systems Engineering Department

1. "Strategic Partnership with Industry to Enhance Engineering Education and Training: The Learning Factory Concept", **T. Ayar and Mohand-Said Oukil**, 2<sup>nd</sup> International Conference on Engineering Education and Training (ICEET-2), April 9-11, 2006, Kuwait
2. "Assessment of Individual Student Performance in Team Projects", **T. Ayar and Ramazan Kahraman**, 2<sup>nd</sup> International Conference on Engineering Education and Training (ICEET-2), April 9-11, 2006, Kuwait.
3. "Revising the Industrial and Systems Engineering Program at KFUPM", **H. K. Al-Fares**, 2<sup>nd</sup> International Conference on Engineering Education and Training (ICEET-2), April 9-11, 2006, Kuwait
4. "A Mathematical Model for Optimum Petrochemical Multi-Grade Selection, Production, and Sequencing", **H. K. Al-Fares**, The 6<sup>th</sup> Conference on the Analysis of Manufacturing Systems (AMS 2007), May 11-16, 2007, Lunten, The

Neitherlands, 199-204.

5. "Objectivity of Students' Evaluation of Faculty", **A. E. Haroun and U. M. Al-Turki**, 2<sup>nd</sup> International Conference on Engineering Education and Training (ICEET-2), April 9-11, 2006, Kuwait
6. "Vibration Monitoring and Fault Detection Using Wavelet Techniques", **B. Al-Saeed, L. Cheded and F. Al-Badou**, International Symposium on Signal Processing and its Application, February 12-15, 2007, Sharjah, U. A. E.
7. "Application of P. S. O. to Channel Equalization", **Awami, W. A. Al-Saif, A. Zerguine, A. Zidouri, L. Cheded**, International Symposium on Signal Processing and its Application, February 12-15, 2007, Sharjah, U.A.E.
8. "Stabilizing Time Delay Systems via Rational Stable Controllers", **Abdul-Wahid A. Saif and Mujahid Dhaifullah**, 4<sup>th</sup> IEEE International Multi-Conference on Systems, Signal and Devices (SSD'07), March 19-22, 2007, Hammamet-Tunisia
9. "Neural Network Identification of Hydrocarbon Potential of Shaly Sand Reservoirs", **M. Elshafei and G. Hamada**, SPE-KSA 2007 Conference, Dhahran, Saudi Aramco, Society of Petroleum Engineering (paper# SPE 110959, 2007)
10. "Evaluation of Petrophysical Properties of Sandstone Reservoirs Using Artificial Neural Networks", **G. Hamada and M. Elshafei**, Proceeding of Second International Conference on Modeling, Simulation and Applied Optimization (ICMSAO'07), Abu-Dhabi, March 24-27, 2007
11. "Dynamic Programming Algorithm for Training Functional Networks", **E. A. El-Sebakhy, S. A. Mohammed and M. Elshafei**, Proceedings of the 2007 International Conference on Artificial Intelligence, (ICAI'07), June 25-28, 2007, USA.

### **College of Industrial Management**

#### **Finance & Economics Department**

1. "Does the Environmental Kuznets Curve exist? An Application of Long-Run Structural Modelling to Saudi Arabia, **Mansur Masih**, and **Lurion De Mello** 30<sup>th</sup> Conference of the International Association for Energy Economics , Wellington, New Zealand , February 2007
2. "Price Dynamics of crude Oil and Regional Petrochemical Markets" **Mansur Masih, Ibrahim Algahtani**, and **Lurion De Mello**, Global Petrochemicals Conference, 4<sup>th</sup> Annual meeting , Frankfurt, Germany, March 2007
3. "Price Dynamics of crude Oil and Regional Petrochemical Markets", **Mansur Masih, Ibrahim Algahtani**, and **Lurion De Mello**, 30<sup>th</sup> Conference of the International Association for Energy Economics, Wellington, New Zealand, February, 2007, Wellington, New Zealand, February, 2007

Department of Management & Marketing

1. “The Perceived Regiocentric Determinants of Foreign Direct Investment in United Arab Emirates”. Anwar, S. A., **Sohail, M. Sadiq** and Fam, K.S (2007) 5<sup>th</sup> International Business Research, Dubai (UAE), April 26 & 27, 2007.
2. “The Effect of Internet Service Quality in Developing Value and Loyalty Relationships: A Conceptual Model” **Sohail, Sadiq** and **Shaikh, Nassar M.** (2007) 2007 Academy for Global Business Advancement World Congress, Penang, Malaysia, May 21-25, 2007.
3. “Consumers’ Spending and Credit Card Usage: Does it Affect Credit Debt?” Ishak Ismail, **Sohail, M. Sadiq** and Hasbalaila Alias,(2007). 2007 Academy for Global Business Advancement World Congress, Penang, Malaysia, May 21-25, 2007.
4. “Learning the ropes, strategizing the way, developing the learning organization; A Singapore case, **Yeo R. K.** Eighth International Conference on HRD Research & Practice Across Europe, Oxford, UK 27-29 June, 2007.
5. “Barriers to Organizational Creativity: a Marketing Executive Perspective in Saudi Arabia”, **Sadi, M.A.** Appeared in the Proceedings of the 4<sup>th</sup> World Congress of the Academy for Global Business Advancement held at Parkroyal Hotel, Penang, Malaysia.

## **10. BOOKS PUBLISHED AND CONTRIBUTIONS**

### **Electrical Engineering Department**

1. "Technical Computation and Visualization in MATLAB for Engineers and Scientists," **Mohammad Nuruzzaman**, Author House, Indiana, USA, February, 2007.

### **Physics Department**

1. "Ionizing Radiation and Indoor Radon Concentration Measurement in the Dwellings of Al-Jauf Region of Saudi Arabia" by **Prof. M.I. Al-Jarallah**.

### **Information & Computer Science**

1. Interactive Curve Modeling with Applications to Computer Graphics, Vision and Image Processing", **Sarfraz, M.** (2008), ISBN: 978-1-84628-870-8, Springer Verlag.
2. "Soft Computing in Industrial Applications: Recent and Emerging Methods and Techniques", **Saad, A., Avineri, E., Dahal, K., Sarfraz, M., Roy, R. (Eds.)**, (2007), Series: *Advances in Soft Computing*, Vol. 39, ISBN: 978-3-540-70704-2, Springer Verlag.
3. "Object Recognition using Particle Swarm Optimization on Fourier Descriptors", **Sarfraz, M. and Al-Awami, A.T.A.** (2007), Soft Computing in Industrial Applications: Recent and Emerging Methods and Techniques, Series: *Advances in Soft Computing*, Saad, A., Avineri, E., Dahal, K., Sarfraz, M., Roy, R. (Eds.), Vol. 39, ISBN: 978-3-540-70704-2, Springer Verlag.
4. "Interactive Curve Modeling with Applications to Computer Graphics, Vision and Image Processing", **Sarfraz, M.** (2008), ISBN: 978-1-84628-870-8, Springer Verlag.
5. "Soft Computing in Industrial Applications: Recent and Emerging Methods and Techniques", **Saad, A., Avineri, E., Dahal, K., Sarfraz, M., Roy, R. (Eds.)**, (2007), Series: *Advances in Soft Computing*, Vol. 39, ISBN: 978-3-540-70704-2, Springer Verlag.
6. "Object Recognition using Particle Swarm Optimization on Fourier Descriptors", **Sarfraz, M. and Al-Awami, A.T.A.** (2007), Soft Computing in Industrial Applications: Recent and Emerging Methods and Techniques, Series: *Advances in Soft Computing*, Saad, A., Avineri, E., Dahal, K., Sarfraz, M., Roy, R. (Eds.), Vol. 39, ISBN: 978-3-540-70704-2, Springer Verlag.

## **11. TECHNICAL REPORTS, FUNDED PROJECTS AND PATENTS**

### **College of Engineering**

#### **Civil Engineering Department**

1. "Multi-Criterion Optimal Design of Reinforced Concrete Beams and Columns: Experimental and Analytical Studies", **Alghamdi, S.A. and Ahmad, S.**, 3<sup>rd</sup> Progress Report, KACST Project AT-23-21, April 18, 2007.
2. "Hydraulic Analysis of Al-Khobar Water Distribution System", **Al-Zahrani, M. and Al-Ghamdi, A.**, Final Report, KACST Research No. APR-22-003, 2007.

#### **Aerospace Engineering Department**

1. "Designing An Optimal Attitude Fuzzy Logic Controller For Three-Axis Stabilized Satellite Using Genetic Algorithms", **Omar, H.M.**, Final Technical Report for The Junior Faculty Project JF2005/12, KFUPM, March, 2007.
2. "Submersible Craft for Water Purification," **Al-Garni, A. Z., Saeed, F., and Al-Asaly, A.**, US Patent 7,168,387, Issued on January 30, 2007, by the U. S. Patent and Trademark Office (USPTO), USA.

### **College of Sciences**

#### **Chemistry Department**

1. "Potential Scans and Vibrational Analyses of Some Halopropanols", **H. M. Badawi** (PI), W. Forner (Co-I), CY-Propanols-297, KFUPM, 2006-2008.
2. "Analysis of Vibrational Spectra and Ring Inversion of Some Heterocyclic Compounds", **H. M. Badawi** (PI), A. Suwaiyan (Co-I) and W. Forner (Co-I), CY-Rotation-309, KFUPM, 2006-2008.
3. "Polyolefin Project (PN 21164) Phase III – "Scale-up and Pilot Plant Study", **Sk. Asrof Ali and Hasan A. Al-Muallem**, SABIC.
4. "Development of Novel Thermoplastic/Polymer Performance Promoters , **Sk. Asrof Ali and Hasan A. Al-Muallem** , CIBA .
5. "Mark space biased and dc differential electrolytic potentiometry combined with flow injection as a potential detector for the determination of cyanide", **A. M.S. Abulkibash**, A SABIC, SAb /2005-19.
6. "Construction of a new detector for ion chromatography, hplc ,flow injection analysis", **A. M.S. Abulkibash, B. El-Ali and M. Alabsi**, A KACST project APR-26-72.

7. “Multinuclear NMR Study of the Interactions of some Sulfur Containing Biologically Important Ligands” , **Fettouhi, Mohammad**, KFUPM funded project.
8. “Primer Coating for corrosion protection by multilayer polyelectrolyte Nanofilms”, **Khaled, M.**, US Patent Application, 2007.

#### Department of Mathematics and Statistics

1	“Bayesian Estimation in Some Power Series Distributions”, <b>Hassan, A., Joarder, A.H and Ahmad, P.B.</b> , Technical Report# 368, (December 2006).
2	“General decay of solutions of a viscoelastic equation”, <b>Messaoudi, S.A.</b> , Technical Report# 369, (December 2006).
3	“On the Central Moments of the Bivariate Beta Distribution”, <b>Omar, M.H. and Joarder, H.A.</b> , Technical Report# 370, (December 2006).
4	“Orthogonal Exponential Zero-Interpolants: Theoretical and Computational Aspects”, <b>Bokhari, M.A.</b> , Technical Report# 371. (January 2007)
5	“On the Bivariate Dirichlet Distribution” , <b>Omar, M.H.</b> , Report# 372, Jan 2007.
6	“Common Fixed Points Iteration Process for a Finite Family of Asymptotically Quasi-nonexpansive Mapping” , <b>Khan, A.R., Domlo, A.A.</b> , and <b>Fukhar-ud-din, H.</b> , Technical Report# 373, (January 2007).
7	“Higher Order Mass Identities, <b>Hossain, M.F.</b> and <b>Joarder, A.H.</b> , Technical Report# 374, (January 2007).
8	“Branching processes with incubation”, <b>Rahimov, I.</b> and <b>Chanane, B.</b> , Technical Report# 375, (May 2007).
9	“Convergence of a non-homogeneous immigration-branching process”, <b>Rahimov, I.</b> , Technical Report# 376, (May 2007).
10	“Stiffly Stable Linear 3-step Methods”, <b>Beg, G.K.</b> , Report# 377, (May 2007).

#### **Monographs, Patents and Books Published:**

1. “Random Coincidence Points of Multivalued Contractive Random Operators”, **A.R. Khan**, in Proceedings of the International conference on Nonlinear analysis and Convex Analysis (2005), Okinawa; Yokohama Publishers, Japan, 2007, pp.215-226.

#### College of Computer Science & Engineering

##### Systems Engineering Department

1. “Community Service Study Report”, AAFAQ Project, February 20, 2007, **H. K. Al-Fares**



## **12. INTERNAL LECTURES AND SEMINARS OFFERED BY KFUPM**

### **FACULTY**

#### **Chemical Engineering Department**

1. Speaker : Ghazi Hamed Al-Utaibi  
Title : Investigations of Mixing in Mechanically Stirred Tanks  
Date : November 22, 2006

#### **Electrical Engineering Department**

1. Speaker : Dr. M.H. Shwehdi  
Topic : Power Transmission and Distribution Systems: Design and Performance  
Date : 15th April 2007.
2. Speaker : Dr. M.H. Shwehdi  
Topic : Performance improvement of Distribution systems with capacitors  
Date : 16<sup>th</sup> of April, 2007
3. Speaker : Dr. M. H. Shwehdi  
Topic : Grounding methods of Power Systems  
Date : 17th April 2007
4. Speaker : Dr. T.Y. Naffouri  
Topic : Broadcasting Data to Multiple User Groups: Information Theoretic Investigation of the wide Band Case.  
Date : Dhahran, Saudi Arabia, May 1st, 2007.
5. Speaker : Dr. Salam Zummo  
Topic : An Overview on Broadband Wireless Access Technologies  
Date : May 6-7, 2007
6. Speaker : Dr. T.Y. Naffouri  
Topic : The Potential of Adaptive Filtering for Seismic Signal Processing.  
Date : Dhahran, May 15, 2007.
7. Speaker : Dr. T.Y. Naffouri  
Topic : Scaling Laws of Multiple Antenna Group-Broadcast Channel  
Date : France, June 20, 2007
8. Speaker : Dr. M. H. Shwehdi  
Topic : Photovoltaic (Pv) Generation Systems; Probabilistic Assessment.  
Date : June 21, 2007
9. Speaker : Dr.T.Y. Al-Naffouri  
Topic : How Much Does Transmit Correlation Affect the Sum-Rate

Date : of MIMO Broadcast Channels  
France, June 21, 2007.

Mechanical Engineering Department

1. Speaker : Muneer Al-Qadhi  
Topic : Development of Overall Thermal Transfer Value Equation for Commercial Building in Saudi Arabia  
Date : January 16, 2007
2. Speaker : Abdullah A. Al-Mesfer  
Topic : Effect of the Fluid Hydrodynamics on Calcium Sulfate  $\text{CaSO}_4$  Deposition on Aluminum Metal Surface  
Date : January 16, 2007
3. Speaker : Tariq A. Al-Ghamdi  
Topic : Proper Sleeving Procedure for Internal FBE Pipelines  
Date : January 16, 2007
4. Speaker : Dr. Mohammed Antar  
Topic : Generation of entropy due to forced convection fluid flow about a solid sphere  
Date : February 27, 2007
5. Speaker : Dr. Amro Al-Qutub  
Topic : Development of Further Capability for the ME High Temperature Tribometer  
Date : March 06, 2007
6. Speaker : Dr. Shafique A. Khan  
Topic : Modeling Geometrically Necessary Dislocation Boundaries  
Date : March 13, 2007
7. Speaker : Hameed Al-Badair  
Topic : The Oxidation Behaviour of High Temperature of Stainless Steels : - SEM, TEM, Auger and Steam Investigations  
Date : March 20, 2007
8. Speaker : Dr. Rohan Abeyaratne & Dr. Kamel Youcef-Toumi, MIT  
Topic : Opportunities and Challenges in Mechanical Engineering Education and Research  
Date : March 27, 2007
9. Speaker : Prof. Kenji Oosawa  
Topic : Nanotechnology in Gunma University, Japan  
Date : April 03, 2007
10. Speaker : Mirza Burtuza Ali Baig  
Topic : Friction and Wear of 20% Volume Fraction Submicron

- |     |         |   |   |
|-----|---------|---|---|
|     |         |   | Al <sub>2</sub> O <sub>3</sub> /6061 Aluminum Alloy Composite for Brake System Application                      |
|     | Date    | : | April 10, 2007  |
| 11. | Speaker | : | Dr. Gasem Fallatah  |
|     | Topic   | : | Long-Term Behaviour of Aramid Fibre   |
|     | Date    | : | April 24, 2007  |
| 12. | Speaker | : | Dr. A.A.N. Shuaib   |
|     | Topic   | : | Integrity of Roller Expanded Tube-to-tubesheet Joints with Over-Enlarged Tubesheet Holes                        |
|     | Date    | : | May 01, 2007  |
| 13. | Speaker | : | Dr. John M. Bell  |
|     | Topic   | : | Nanotechnology Applied to Solving Environmental Issues – Water and Energy                                       |
|     | Date    | : | May 08, 2007  |
| 14. | Speaker | : | Prof. Yehia A. Khulief  |
|     | Topic   | : | Numerical & Experimental Investigation of Drillstring Vibration   |
|     | Date    | : | May 15, 2007  |
| 15. | Speaker | : | Asrarul Kounain   |
|     | Topic   | : | Impact Damage & Burst Test Characterization of GFRP Composites  |
|     | Date    | : | May 22, 2007  |
| 16. | Speaker | : | Syed Nizamuddin   |
|     | Topic   | : | Weathering Effects of Tensile and Creep Strength of Glass Fiber Vinylester and Epoxy Reinforced Thermoset Pipes |
|     | Date    | : | May 22, 2007  |
| 17. | Speaker | : | Hasan Baig  |
|     | Topic   | : | A Numerical Analysis of conjugate Conduction-Natural Convection in a Hollow Building Block                      |
|     | Date    | : | May 22, 2007  |
| 18. | Speaker | : | Ahmad Saleh Al-Omari  |
|     | Topic   | : | Finite Element Modeling of Ring Splitting Test to Predict Residual Stresses in Spiral Welded Pipe               |
|     | Date    | : | May 29, 2007  |
| 19. | Speaker | : | Fathi N. Mayoof   |
|     | Topic   | : | Vibration in Systems Involving Carbon Nanotubes   |
|     | Date    | : | May 29, 2007  |

20. Speaker : Abdullah M. Al-Qahtani  
 Topic : Design and Operate a Fouling Monitoring Device to Study Fouling Twisted Tube  
 Date : May 29, 2007

21. Speaker : Imtiyaz Kazi  
 Topic : Effect of Variable Properties on Area Allocation in Heat Exchanger  
 Date : May 30, 2007

1. " Intellectual property and Technology transfer in Universities and Research and development institutions", **A.M. Al-Qutub**, World intellectual property organization (WIPO) Regional Seminar For Arab Countries on the Intellectual property and transfer of technology organized by World intellectual property organization and Islamic development bank in corporation with Ministry of commerce and industry of kingdom of Saudi Arabia held in Riyadh June 4 to 6-2007.

#### Chemistry Department

1. Speaker : **Dr. Mohammad Nahid Siddiqui**  
 Topic : On Line Application Submission for Conference Attendance-a Live Example  
 Date : 27 February, 2007

2. Speaker : **Dr. Anvarhusein A. Isab**  
 Topic : Multinuclear NMR Study of Interactions of Sulfur Containing Biologically Important Legends  $CD^{2+}$  and  $Hg^{2+}$  Ions  
 Date : 5 May, 2007

3. Speaker : **Dr. Dr. Anvarhusein A. Isab**  
 Topic : Synthesis of Gold(III)-Diamines complexes and their Interactions with Biological Molecules Studies by solid and solution NMR  
 Date : 12 May, 2007

4. Speaker : **Dr. Bassam El Ali**  
 Topic : Rhodium- catalyzed one pot hydroformylation – Cyclization Reactions of allylbenzene derivatives  
 Date : 15 May, 2007

7. Speaker : **Dr. Abdulazeez Al-Saadi**  
 Topic : Conformational Properties of 2-Indanol and 3-Cyclopentenol: Spectroscopic and Computational Studies.  
 Date : 29 May, 2007

Department of Mathematics and Statistics

**Lecturers/Seminars by Math Faculty:**

1	Speaker Title Date	: : :	Dr. Q.H. Ansari Multi-objective Optimization and Vector Variational Inequalities Wednesday, February 28, 2007
2	Speaker Title Date	: : :	Drs. A.R. Khan and Q.H. Ansari Iterative Methods for Solving Variational Inequalities with Applications Sunday, March 04, 2007
3	Speaker Title Date	: : :	Prof. A.H. Bokhari Ricci Collineations of Space-Times Sunday, March 04, 2007
4	Speaker Title Date	: : :	Dr. J. AlMutawa Stochastic Subspace Identification of Linear Systems with Observation Outliers Sunday, March 11, 2007
5	Speaker Title Date	: : :	Dr. R.M. Latif Topological Properties of Theta Open Sets Sunday, March 18, 2007
6	Speaker Title Date	: : :	Prof. M.A. ElGebeily Identification of the Blur Operator and Image Restoration Via Minimization of Variation Sunday, 1 <sup>st</sup> April 2007
7	Speaker Title Date	: : :	Dr. M.A. Bokhari On Gauss-Radual/Lobatto Quadrature Rules Tuesday, May 8, 2007
8	Speaker Title Date	: : :	Dr. Rajai Alassar Transient Inviscid Flow past Two Cylinders Tuesday, May 8, 2007
9	Speaker Title Date	: : :	Dr. Messaoudi, S.A. Elastic versus viscoelastic materials, <b>[First Theoretical Physics day in Phy. Dept. KFUPM]</b> Sunday, May 13, 2007
10	Speaker Title Date	: : :	Dr. Umar, Abdullahi Semi-Group of Order-Decreasing Transformations on Posts Tuesday, May 15, 2007
11	Speaker Title Date	: : :	Dr. Jawad Abuhlail Corings and Comodules Almost Everywhere Sunday, May 20, 2007
12	Speaker Title Date	: : :	Profs. Mohamed ElGebeily and Abul Hasan Siddiqi Wavelet Based Methods for Meteorological Data Processing Tuesday, May 22, 2004
13	Speaker Title Date	: : :	Dr. Latif M. Raja Characterizations of Mappings in Theta-Open Sets Tuesday, May 29, 2007
14	Speaker Title Date	: : :	Dr. F.D. Zaman On ISI Quality Measures <b>(A presentation to the Earth Sciences Dept. Council, KFUPM)</b> January 2007

15	Speaker	:	Dr. M. Yousuf
	Title	:	Numerical Solution for Inverse Initial Problems in Heat Equation Using Positivity Preserving Padé Schemes”
	Date	:	Tuesday, April 17, 2007

#### Math Education Seminars

1	Speaker	:	Prof. Mourad H. Ismail ( <i>Univ. of Central Florida, USA</i> )
	Title	:	Some Applications of Special Functions
	Date	:	Tuesday, May 01, 2007
2	Speaker	:	Sir Michael Atiyah (Video lecture)
	Title	:	Geometry and Physics from Plato to Hawking
	Date	:	Tuesday, May 22, 2007

#### Lectures/Seminars by outside speakers

1	Speaker	:	Dr. Kahar El-Hussein, ( <i>Dept. of Math. Al-Jouf Univ. (KSU)</i> )
	Title	:	Heisenberg Group and the Invalidity of the Theory of Hormander for Partial Differential Equations
	Date	:	Sunday, February 18, 2007
2	Speaker	:	Prof. Abdul Hamid Kara, ( <i>Univ. of Witwatersrand, Johannesburg, South Africa</i> )
	Title	:	Noether Symmetries Versus Killing Vectors and Isometries of Spacetimes
	Date	:	Sunday, February 25, 2007
3	Speaker	:	Dr. Mohamed Medjden (I) ( <i>USTHB, Algiers, Algeria</i> )
	Title	:	The Navier-Stokes Equations in Arbitrary Three-dimensional Domains. Introduction and Linear Case.
	Date	:	Sunday, March 18, 2007
4	Speaker	:	Dr. Mohamed Medjden (II) ( <i>USTHB, Algiers, Algeria</i> )
	Title	:	The Navier-Stokes Equations in Arbitrary Three-dimensional Domains. Introduction and Linear Case.
	Date	:	Sunday, March 20, 2007
5	Speaker	:	Dr. Ali Sahin, ( <i>R.I. KFUPM</i> )
	Title	:	Estimation of Regionalized Variables
	Date	:	Sunday, March 20, 2007
6	Speaker	:	Prof. A. Potra Florian, ( <i>Univ. of Maryland, USA</i> )
	Title	:	Interior Point Methods for Mathematical Programming
	Date	:	Sunday, April 08, 2007
7	Speaker	:	Prof. Mourad H. Ismail, ( <i>Univ. of Central Florida, USA</i> )
	Title	:	Some Applications of Special Functions
	Date	:	Tuesday, May 06, 2007

#### Research (StaR) Group Seminar

1	Speaker	:	Dr. M.H. Omar
	Title	:	Bootstrapping and the Standard Error of Equating
	Date	:	Tuesday, March 13, 2007
2	Speaker	:	Dr. I. Rahimov
	Title	:	Closure of the Sub-Exponential Class Under the Convolution
	Date	:	Tuesday, March 27, 2007

3	Speaker Title Date	: : :	Dr. A.H. Joarder On the Multivariate Pearson Type II Distribution Tuesday, April 10, 2007
4	Speaker Title Date	: : :	Dr. H. Muttalak & Mr. A. Muazu Monitoring the Process Mean and Variance Using Ranked Set Sampling and Its Modification Tuesday, May 22, 2007
5	Speaker Title Date	: : :	Mr. M.R. Abujiya Technology and Statistics Education Tuesday, April 24, 2007

#### **DERL (Differential Equations Research Lab)**

1	Speaker Title Date	: : :	Dr. M. Kassem An Alternating Direction Implicit Method for Solving Time Dependent Problems Tuesday, February 27, 2007
2	Speaker Title Date	: : :	Dr. A. Boucherif Positive Solutions of Second Order Boundary Value Problems Tuesday, April 3, 2007
3	Speaker Title Date	: : :	Dr. A. R. Khan Coupled Fixed Points and Boundary Value Problems Tuesday, April 24, 2007
4	Speaker Title Date	: : :	Dr. K. Furati Differential Inequalities for Fractional Differential Equations Tuesday, May 8, 2007
5	Speaker Title Date	: : :	Dr. K. Al-Shammari Solutions to Discontinuous Differential Equations Tuesday, May 15, 2007

#### **Commutative Algebra Weekly Seminar (Organizer: Dr. S. Kabbaj), March–May 2007 (Seminars given by the following faculty members)**

1	Speaker Title	: :	Mr. A. Ben-Obaïd Star-Operation Induced by Overrings (1)
2	Speaker Title	: :	Mr. A. Ben-Obaïd Star-Operation Induced by Overrings (2)
3	Speaker Title	: :	Mr. A. Ben-Obaïd Star-Operation Induced by Overrings (3)
4	Speaker Title	: :	Mr. K. Al-Hazmy Reductions of Ideals in Local Rings (1)
5	Speaker Title	: :	Mr. K. Al-Hazmy Reductions of Ideals in Local Rings (2)
6	Speaker Title	: :	Mr. K. Al-Hazmy Reductions of Ideals in Local Rings (3)
7	Speaker Title	: :	Mr. M. Jarrar Star-Modules Over Valuation Rings (1)
8	Speaker Title	: :	Mr. M. Jarrar n-Star Modules and n-Tilting Modules (2)
9	Speaker Title	: :	Mr. M. Jarrar Equivalence and Tilting Theory (3)

10	Speaker Title	:	Dr. S. Kabbaj -- <b>Special Seminar [Commutative Algebra Research Lab (CARL)]</b> Subalgebras of affine domains over noetherian domains
11	Speaker Title	:	Dr. S. Kabbaj -- <b>Special Seminar [Commutative Algebra Research Lab (CARL)]</b> Trivial extensions defined by Gaussian conditions

### Students Seminar

1	Speaker Title Date	:	Mr. Ali S. Al-Qahtani First Order Impulsive Integro-Differential Equations Tuesday May 29, 2007
2	Speaker Title Date	:	Mr. Ali S. Al-Qahtani Impulsive Control Systems Sunday, June 03, 2007
3	Speaker Title Date	:	Mr. M. Islam Math 699 [Oral Comprehensive and Proposal Defense] Sunday, June 03, 2007
4	Speaker Title Date	:	Mr. M.S. Jarrar Math 699 [Oral Comprehensive and Proposal Defense] Sunday, June 03, 2007

### Physics Department

1. “Biotechnology/genetic Engineering Principles and Applications”, **Amjad Khalil**, 16<sup>th</sup> December 2006 , KFUPM, Dhahran.
2. “Is Nanotechnology going to be the center of technology of the 21<sup>st</sup> century”, Munir Nayfeh, University of Illinois, USA, 26 May 2007, KFUPM, Dhahran.

Speaker : F. Z. Khiari  
 Title : Students’ Difficulties with Physics Concepts in Introductory Mechanics Courses  
 Date : February 25, 2007

Speaker : A.Aksoy  
 Title : Enhancement of Technical Capability of the 14 MeV FNAA Facility at KFUPM  
 Date : February 27, 2007

Speaker : M.Elshafei  
 Title : Recent issues in Bioinformatics: The protein folding pr  
 Date : March 11, 2007

Speaker : A.Al-Karmi  
 Title : Actions of Radiations on Living Cells  
 Date : April 1, 2007

Speaker : N. Maalej  
 Title : Entrepreneurships & Innovation program a Singapore Experience



Date : April 8, 2007  
 Speaker : K.A. Ziq  
 Title : Magnetic properties of ZnO-TM semiconductor  
 Date : April 24, 2007  
 Speaker : Amjad Khalil  
 Title : Principles and applications of Biotechnology.  
 Date : April 29, 2007  
 Speaker : N. Maalej  
 Title : Cancer treatment dosimetry using monte carlo simulation of photon beam interaction with body tissues  
 Date : May 6, 2007  
 Speaker : A. Al-Sunaidi  
 Title : Dynamics and morphology of phase separating liquid crystal-polymer blends  
 Date : May 6, 2007  
 Speaker : Rashad Al-Gashani  
 Title : Design of a microwave heater  
 Date : May 20, 2007  
 Speaker : Saifuddin Burhan  
 Title : Photoacoustic trace gas analysis  
 Date : May 29, 2007  
 Speaker : Hashem Al-Attas & Shoaib Quraishi  
 Title : KFUPM Library E-Resources and Services  
 Date : June 03, 2007  
 Speaker : Hocine Bahlouli  
 Title : Density of States Associated with Tridiagonal Hamiltonians  
 Date : March 1, 2007, University of Al-Ain, UAE

### **SEMINARS OFFERED BY OUTSIDE SPEAKERS IN PHYSICS**

- Speaker : Esam E.Abel Hady, El-Minia University, Egypt  
Title : Application of Positron Lifetime Spectroscopy to the Study of Microstructural Defects in Polymers  
Date : March 13, 2007
- Speaker : Y. MESSADEQ, Institute of Chemistry, Sao Paulo, Brazil  
Title : Photoinduced Effects in Chalcogenide Glasses: Properties and Applications  
Date : March 18, 2007
- Speaker : Y. MESSADEQ, Institute of Chemistry, Sao Paulo, Brazil  
Title : Development of Optical Fibers Based on GeO<sub>2</sub> for S-band telecommunication Window  
Date : March 20, 2007
- Speaker : Santiago Ruiz De Velasco, Pearson Education, Dubai  
Title : University Physics by Young – 12<sup>th</sup> Edition  
Date : March 27, 2007
- Speaker : Riazuddin, National Center for Physics, Pakistan  
Title : Astroparticle physics, dark energy and accelerating universe  
Date : April 22, 2007
- Speaker : Munir Nayfeh, University of Illinois, USA  
Title : Silicon nanoparticles: nanomaterial at the transition between solid and molecule  
Date : May 27, 2007

### **Theoretical Physics Day Event 13 May 2007**

- Speaker: Mourad Ismail , University Central Florida, USA,  
Title: “Certain Aspects of Second Order Operator Equations”
- Speaker: A.D. Al-Haidari and M.S. Abdelmonem, Shura Council and Physics Department, KFUPM.  
Title: “Tridiagonal Physics and its applications”
- Speaker: Gabor Korvin, Earth Sciences department, KFUPM  
Title: “A new rock physical Model”
- Speaker: Mohamed El-Gebeily, Mathematical Sciences department, KFUPM.  
Title: “Axioms and fundamental equations of image scale space”
- Speaker: Bekir Yilbas, Mechanical Engineering department, KFUPM.  
Title: “Electron Kinetic Theory Approach Pertinent to Laser Pulsed Heating”
- Speaker: Salim Messaoudi, Mathematical Sciences department, KFUPM.

Title: “Elastic versus viscoelastic materials”

Speaker: Djamel Dou, Physics Department, KSU.

Title: “Black Holes and the Entropy of Entanglement”

Information & Computer Science Department

1. Speaker : Dr. Mohammad Sarfraz  
Title : On Bookwriting (Arabic Computing Group)  
Date : May 2, 2007

Computer Engineering Department

1. Speaker : Dr. Aiman El-Maleh  
Title : Defect-Tolerant N<sup>2</sup>-Transistor Structure for Reliable Design at the Nano-scale  
Avenue : Design Automation and Test in Europe Workshop titled “Robust Computing with Nano-scale Devices: Progresses and Challenges”, Nice, France.  
Date : April, 2007
2. Speaker : Engr. Majed Al-Shangiti  
Manger, Systems Administration at SABEC  
Title : The Journey of Majed Al-Shangiti: From a Computer Engineering Student to Manager at SABEC.  
Date : April 30, 2007
3. Speaker : Dr. Ahmad A. Masoud  
EE Department, KFUPM  
Title : A Discrete Harmonic Potential Field for Optimum Point-to-point Routing on a Weighted Graph.  
Date : May 1, 2007

**COE Seminars:**

1. Speaker : Mr. Muhammad Aabed  
COE MS Student (R.A.)  
Title : Downlink Traffic Power Characterization for Multi-Rate Wireless CDMA Data Networks  
Date : March 13, 2007
2. Speaker : Mr. Syed Asadullah  
COE Part-Time MS Student  
Title : Engineering Modern Iterative Heuristics to Solve OSPF Weight Setting Problem  
Date : April 3, 2007
3. Speaker : Mr. Umair Farooq Siddiqi  
COE MS Student (R.A.)

- |    |         |   |  |
|----|---------|---|--|
|    | Title   | : | Parallel Algorithms for Look-up Table (LUT) Inverse Halftoning |
|    | Date    | : | April 3, 2007  |
| 4. | Speaker | : | Mr. Nayef F. Mendahawi<br>COE Part-Time MS student             |
|    | Title   | : | Parallel Algorithms for Look-Up Table (LUT) Inverse Halftoning |
|    | Date    | : | April 24, 2007   |
| 5. | Speaker | : | Mr. Bandar Al-Sulaimani<br>COE Part-Time MS Student            |
|    | Title   | : | Voice over IP call Hijacking                                   |
|    | Date    | : | May 8, 2007  |

#### Systems Engineering Department

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|----|---------|---|---|
| 1. | Speaker | : | Mr. Atiq Siddiqui, Lecturer   |
|    | Title   | : | “Scenario-Based E-Learning Products/Tools (SBELPs) to Enhance Student Learning & Motivation: An Experience Sharing” |
|    | Date    | : | May 1, 2007   |
| 2. | Speaker | : | Mr. Syed Naqeebuddin  |
|    | Title   | : | “Multi-Objective Traffic Engineering Optimization over the Internet”  |
|    | Date    | : | May 15, 2007  |

#### Finance and Economics Department

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|----|---------|---|---|
| 1. | Speaker | : | Prof. Mansur Masih<br>Invited Keynote Speech as the holder of Saudi Aramco<br>Chair Professor of Energy Economics |
|    | Title   | : | Recent Developments in the Economics of Renewable Energy: Directions for Future Research                          |
|    | Date    | : | May 1, 2007   |
|    | Venue   | : | The International Workshop of the Center of Research Excellence in Renewable Energy held at KFUPM                 |

### **13. SEMINARS OFFERED BY OUTSIDE SPEAKERS IN THE UNIVERSITY**

#### Petroleum Engineering Department

- |    |         |   |   |
|----|---------|---|---|
| 1. | Speaker | : | Abdul-Jaleel Al-Khalifah, 2007 President of SPE<br>International<br>Saudi Aramco                              |
|    | Topic   | : | Advancing Industry-Academia Collaboration   |
|    | Date    | : | 5 <sup>th</sup> March 2007  |
| 2. | Speaker | : | Fikri Kuchuk, Chief Reservoir Engineer,<br>Schlumberger Testing Services, Schlumberger                        |
|    | Topic   | : | Emerging Technologies for Determining In-Situ Flow<br>Properties and Recovery Efficiency                      |
|    | Date    | : | 6 <sup>th</sup> March 2007  |
| 3. | Speaker | : | Maytham Ismael, Production Engineer<br>Saudi Aramco   |
|    | Topic   | : | Programs offered by SPE to Develop the Technical and<br>Leadership Skills of Students and Young Professionals |
|    | Date    | : | 9 <sup>th</sup> April 2007  |
| 4. | Speaker | : | George J. Hirasaki<br>Chemical Engineering Department, Rice University,<br>Houston, Texas, USA.               |
|    | Topic   | : | Alkaline Surfactant Flooding with Foam Mobility Control   |
|    | Date    | : | 30 <sup>th</sup> April 2007   |
| 5. | Speaker | : | Hazim Abbas, Petroleum Engineering Specialist<br>Saudi Aramco   |
|    | Topic   | : | Geomechanical Problems/Applications in Petroleum<br>Engineering   |
|    | Date    | : | 14 <sup>th</sup> May 2007   |
| 6. | Speaker | : | Bandar Al-Malki, Senior Reservoir Engineer<br>Saudi Aramco  |
|    | Topic   | : | Successful Hydraulic and Acid Fracturing Campaign in the<br>Pre-Khuff and Khuff Reservoirs                    |
|    | Date    | : | 21 <sup>st</sup> May 2007   |
| 7. | Speaker | : | Amin H. Nasser, Vice President of Petroleum Engineering<br>& Development, Saudi Aramco                        |
|    | Topic   | : | New Upstream Challenges & Opportunities   |
|    | Date    | : | 21 <sup>st</sup> May 2007   |

### Chemistry Department

1. Speaker : Dr. Eid Al-Harby  
Topic : Characteristics of a Good-Multiple Choice Item  
Date : 4 March, 2007
2. Speaker : Dr. Esam E, Abdel-Hady  
Topic : Positron Annihilation Spectroscopy for Non Destructive Characterization of Materials  
Date : 20 March, 2007
3. Speaker : Prof. Richard R. Ernst (Noble Laureate)  
Topic : Fourier Transform Methods in NMR and in other Spectroscopies  
Date : 24 March, 2007
4. Speaker : Mr. Hood M. Zaher  
Topic : Lab Safety  
Date : 8 May, 2007
5. Speaker : Prof. Robert Baldwin  
Topic : Applications of Molecular Modeling in Chemical Engineering Education  
Date : 14 May, 2007
6. Speaker : Dr. Munir Nayfeh  
Topic : Luminescent Silicon nanoparticles: a new generation of highly fluorescent markers for living cell analysis  
Date : 22 May, 2007

### Department of Mathematics and Statistics

#### **Seminars Outside KFUPM**

1	Speaker	:	Dr. Messaoudi, S.A.
	Title	:	How to write and evaluate a thesis (in Arabic), Math department
	Location	:	Dammam, Girls College
	Date	:	May 15, 2007
2	Speaker	:	Dr. Bokhari, M.A.
	Title	:	How to Generate Research Problems”, CASPAM, BZU, Pakistan
	Date	:	February 2007
3	Speaker	:	Dr. Bokhari, M.A.
	Title	:	Mixing Interpolation with Orthogonality Beyond Compact Interval”,
		:	Center for Physics and Mathematics, National University of Sciences and Technology, Pakistan
	Date	:	February 2007
4	Speaker	:	Dr. Joarder, A.H.
	Title	:	A Bivariate Chi-square Distribution and Some of its Properties (KSU, Riyadh)
	Date	:	March 11, 2007

5	Speaker Title Date	: : : :	Dr. Joarder, A.H. Evaluation of Mean and Variance Integrals without Integration <i>KSU (Riyadh)</i> March 11, 2007
6	Speaker Title Date	: : : :	Dr. Khan, A.R. Fixed Points of a Mixed Monotone Mapping—An Overview; Centre for Advanced Studies in Pure and Applied Mathematics, Bahauddin Zakariya, Univ, Multan, Pakistan February 13, 2007
7	Speaker Title Date	: : : :	Dr. Khan, A.R. A Unified Iteration Scheme for Asymptotically Nonexpansive Mapping, Center for Advanced Studies in Pure and Applied Mathematics, Bahauddin Zakariya, Univ, Multan, Pakistan February 14, 2007

#### Physics Department

1. Speaker : Dr. F. Z. Khiari  
Title : Students' Difficulties with Physics Concepts in Introductory  
Mechanics Courses  
Date : February 25, 2007
2. Speaker : Dr. A. Aksoy  
Title : Enhancement of Technical Capability of the 14 MeV FNAA  
Facility at KFUPM  
Date : February 27, 2007
3. Speaker : Dr. M. Elshafei  
Title : Recent issues in Bioinformatics: The protein folding pr  
Date : March 11, 2007
4. Speaker : Dr. A. Al-Karmi  
Title : Actions of Radiations on Living Cells  
Date : April 1, 2007
5. Speaker : Dr. N. Maalej  
Title : Entrepreneurships & Innovation program a Singapore  
Experience  
Date : April 8, 2007
6. Speaker : Dr. K.A. Ziq  
Title : Magnetic properties of Zn-TM semiconductor  
Date : April 24, 2007
7. Speaker : Dr. Amjad Khalil  
Title : Principles and applications of Biotechnology.  
Date : April 29, 2007
8. Speaker : Dr. N. Maalej  
Title : Cancer treatment dosimetry using monte carlo simulation of

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|-----|---------|---|--|
|     | Date    | : | photon beam interaction with body tissues<br>May 6, 2007                     |
| 9.  | Speaker | : | Dr. A. Al-Sunaidi  |
|     | Title   | : | Dynamics and morphology of phase separating liquid<br>crystal-polymer blends |
|     | Date    | : | May 6, 2007  |
| 10. | Speaker | : | Dr. Rashad Al-Gashani  |
|     | Title   | : | Design of a microwave heater   |
|     | Date    | : | May 20, 2007   |
| 11. | Speaker | : | Saifuddin Burhan   |
|     | Title   | : | Photoacoustic trace gas analysis   |
|     | Date    | : | May 29, 2007   |
| 12. | Speaker | : | Dr. Hashem Al-Attas & Mr. Shoaib Quraishi                                    |
|     | Title   | : | KFUPM Library E-Resources and Services                                       |
|     | Date    | : | June 03, 2007  |
| 13. | Speaker | : | Hocine Bahlouli  |
|     | Title   | : | Density of States Associated with Tridiagonal Hamiltonians                   |
|     | Date    | : | March 1, 2007, University of Al-Ain, UAE                                     |

#### **SEMINARS OFFERED BY OUTSIDE SPEAKERS IN PHYSICS**

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|-----|---------|---|--|
| 14. | Speaker | : | Dr. Esam E. Abdel Hady, El-Minia University, Egypt   |
|     | Title   | : | Application of Positron Lifetime Spectroscopy to the Study<br>of Microstructural Defects in Polymers |
|     | Date    | : | March 13, 2007   |
| 15. | Speaker | : | Dr. Y. Messadeq, Institute of Chemistry, Sao Paulo, Brazil   |
|     | Title   | : | Photo-induced Effects in Chalcogenide Glasses: Properties<br>and Applications                        |
|     | Date    | : | March 18, 2007   |
| 16. | Speaker | : | Dr. Y. Messadeq, Institute of Chemistry, Sao Paulo, Brazil   |
|     | Title   | : | Development of Optical Fibers Based on GeO <sub>2</sub> for S-band<br>telecommunication Window       |
|     | Date    | : | March 20, 2007   |
| 17. | Speaker | : | Dr. Santiago Ruiz De Velasco, Pearson Education, Dubai   |
|     | Title   | : | University Physics by Young – 12 <sup>th</sup> Edition   |
|     | Date    | : | March 27, 2007   |
| 18. | Speaker | : | Dr. Riazuddin, National Center for Physics, Pakistan   |



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|-----|---------|---|--|
|     | Title   | : | Astroparticle physics, dark energy and accelerating universe                     |
|     | Date    | : | April 22, 2007   |
| 19. | Speaker | : | Dr. Munir Nayfeh, University of Illinois, USA                                    |
|     | Title   | : | Silicon nanoparticles: nanomaterial at the transition between solid and molecule |
|     | Date    | : | May 27, 2007   |

### **Theoretical Physics Day Event 13 May 2007**

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|-----|---------|---|--|
| 20. | Speaker | : | Mourad Ismail , University Central Florida, USA,                                     |
|     | Title   | : | “Certain Aspects of Second Order Operator Equations”                                 |
| 21. | Speaker | : | Dr. A.D. Al-Haidari and M.S. Abdelmonem, Shura Council and Physic Department, KFUPM. |
|     | Title   | : | “Tridiagonal Physics and its applications”   |
| 22. | Speaker | : | Dr. Gabor Korvin, Earth Sciences department, KFUPM                                   |
|     | Title   | : | “A new rock physical Model”  |
| 23. | Speaker | : | Dr. Mohamed El-Gebeily, Mathematical Sciences Department, KFUPM.                     |
|     | Title   | : | “Axioms and fundamental equations of image scale space”                              |
| 24. | Speaker | : | Dr. Bekir Yilbas, Mechanical Engineering department, KFUPM.                          |
|     | Title   | : | “Electron Kinetic Theory Approach Pertinent to Laser Pulsed Heating”                 |
| 25. | Speaker | : | Dr. Salim Messaoudi, Mathematical Sciences Department, KFUPM.                        |
|     | Title   | : | “Elastic versus viscoelastic materials”  |
| 26. | Speaker | : | Dr. Djamel Dou, Physics Department, KSU.   |
|     | Title   | : | “Black Holes and the Entropy of Entanglement”  |

### Systems Engineering Department

1. Speaker : Dr. D.N.P. Murthy, Research Professor, University of Queensland, Australia  
Title : Engineering Education  
Date : March 14, 2007
2. Speaker : Dr. D.N.P. Murthy, Research Professor, University of Queensland, Australia  
Title : New Research in Maintenance  
Date : March 14, 2007
3. Speaker : Dr. Lahoucine Ettaleb, Pulp and Paper Research Institute, Canada  
Title : Control Loop Performance Monitoring for SISO and MIMO Systems  
Date : March 27, 2007
4. Speaker : Dr. Lahoucine Ettaleb, Pulp and Paper Research Institute, Canada  
Title : How to Audit a Process Unit in Order to Improve Its Quality Uniformity  
Date : March 27, 2007
5. Speaker : Dr. Lahoucine Ettaleb, Pulp and Paper Research Institute, Canada  
Title : Level Control of an Integrating Process Having a Large Time Delay and Large Disturbances  
Date : April 1, 2007
6. Speaker : Dr. Moncer Hariga, School of Engineering, American University of Sharjah, UAE  
Title : Stochastic Inventory Problems with Space Limitation  
Date : April 1, 2007
7. Speaker : Prof. Florian Potra, Department of Mathematics and Statistics, University of Maryland, Baltimore County, USA  
Title : Applications of Numerical Optimization in Bioinformatics  
Date : April 10, 2007