About Faculty

Prof. Karan S. Surana

Karan S. Surana was born in India, he went to undergraduate school at Birla Institute of Technology and Science (BITS), Pilani, India and received a B.E. degree in Mechanical Engineering in 1965. He then attended the University of Wisconsin, Madison where he obtained M.S. and Ph.D. in Mechanical Engineering in 1967 and 1970. He worked in industry in research and development in various areas of computational mechanics and software development for fifteen years: SDRC, Cincinnati (1970-1973), EMRC, Detroit (1973-1978) and McDonnell Douglas, St. Louis (1978-1984). In 1984, he joined The University of Kansas, Department of Mechanical Engineering faculty where he is currently serving as Deane E. Ackers University Distinguished professor of Mechanical Engineering.

His areas of interest and expertise are computational mathematics, computational mechanics and continuum mechanics. He is author of over 350 research reports, conference papers and journal papers. He has served as advisor and chairman of 50 M.S. students and 22 Ph.D. students at the University of Kansas in the department of Mechanical Engineering in various areas of Computational Mathematics and Continuum Mechanics. His most notable contributions include: large deformation finite element formulations of shells, p-version hierarchical formulations for shells and beams and laminated composite shells and beams for finite deformation and heat conduction, k-version of finite element method, operator classification and variationally consistent integral forms in methods of approximations and ordered rate constitutive theories for solid and fluent continua. He has authored text book entitled 'Advanced Mechanics of Continua,' CRC/Taylor & Francis, 2014. A more complete resume with links to journal articles can be found at

http://me.engr.ku.edu/about/people/surana.html

Dr. Ravi Ragoju

Ragoju Ravi was born in India, He received B.Sc degree from Osmania University, in 2007. Obtained M.Sc (Applied Mathematics) and PhD degrees from NIT Warangal, Warangal, in 2009 and 2013 respectively. He worked at VIT Vellore for a year as an Assistant Professor (2012-2013). Currently he is working as an Assistant Professor of mathematics in the Department of Humanities and sciences at National Institute of Technology Goa, India. His area of interest is Linear and Nonlinear Stability analyses of convective flows, Fluid Mechanics.

About NIT Goa

The National Institute of Technology Goa (NIT Goa) is a premier technical Institute of the region. NIT Goa was established in the year 2010 by an act of parliament (NIT act 2007) and it is declared as 'Institute of National Importance'. NIT Goa is an autonomous institute and functioning under the aegis of Ministry of human Resource Development (MHRD), Govt. of India. The campus is located at Farmagudi, Ponda approximately 29 km southeast of Panaji, the capital of Goa and it is a temporary campus. The state of Goa is well connected by road ways, rail ways and air ways with various parts of the country

The Institute offers under Graduate and Post Graduate courses in three Engineering Departments: (1) Computer Science and Engineering (2) Electronics and Communication Engineering and (3) Electrical and Electronics Engineering. The Institute also offers Ph.D in all the three above mentioned engineering departments. Along with that the Institute offers Ph.D in Mechanical Engineering, Physics, Chemistry, Mathematics, Economics and English.

The Institute admits students into the B.Tech degree program on the basis of ranks obtained in the Joint Entrance Examination JEE(Main) and the scheme of Direct Admission to Students Abroad (DASA) with an intake of 30 students in each branch. The institute is sincerely attempting to deliver quality education and to achieve excellence in teaching, learning and research with high professional ethics.

For M.Tech Programme, the Institute admits students through valid GATE score followed by CCMT (Centralized Counselling for M.Tech Admissions). Each department is offering 20 seats for the said programme, out of which 18 seats will be filled up through CCMT and the remaining 2 seats are meant for the sponsored candidates.

http://www.nitgoa.ac.in/

For more details please contact

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GLOBAL INITIATIVE OF ACADEMIC NETWORKS

GLOBAL INITIATIVE ON ACADEMIC NETWORK (GIAN)

10 Days Course on

Computational Mathematics and Finite Element Method

1-11 July 2016

under the aegis of

Government of India
Ministry of Human Resource Development

सत्यमेव जयते

Venue:

National Institute of Technology Goa
Farmagudi, Ponda, Goa-403401

Overview of the Course

Computational mathematics is a branch of applied mathematics in which we develop and study various computational methods that can be used to obtain numerical solutions of the mathematical models derived for physical systems of interest. In this specific course we concentrate on techniques, methods, and infrastructure that can be applied for obtaining numerical solutions of mathematical models consisting of differential and partial differential equations describing stationary and time dependent processes i.e. boundary value problems (BVPs) and initial value problems (IVPs). It is now well established that the finite element method (FEM) is the most superior current computational technique for accomplishing this. Thus, the objective of this course is to study the mathematics of computations for BVPs and IVPs using finite element technique such that the totality of all BVPs and IVPs are addressed in the most general, consistent, and rigorous manner without problem specific and ad-hoc treatments.

Course Objectives

The objective of the course is to

- Present mathematics of computations, computational infrastructure details, and its applications to BVPs and IVPs such that numerical solutions of all BVPs and IVPs are considered in a consistent and application independent fashion.
- Understand the mathematical classification of the differential operators appearing in the totality of all BVPs and IVPs and consideration of the methods of approximation for these operators to establish using the elements of calculus of variations which integral forms yield unconditionally stable computations (VC integral forms).
- Teach details of a computational framework that enables computations of theoretical solutions numerically for BVPs as well as IVPs regardless of the complexities of the mathematical models, their origin, or the field of application.

Course Outline

- Mathematical classification of the differential operators for BVPs and IVPs
- Methods of approximation for BVPs and IVPs
- Integral forms : VC and STVC of the integral forms : unconditional stability
- FEM for BVPs
- Space-time decoupled and space-time coupled FEMs for IVPs.
- Higher order spaces, convergence, stability, accuracy and adaptivity.

Expected Outcome

Those who attend the course and follow the material will benefit in strengthening their knowledge in the following areas.

- Mathematical framework needed for computing solutions of PDEs for BVPs and IVPs
- Necessity of mathematical classification of differential operators and their use in conjunction with methods of approximation and calculus of variations to ensure unconditionally stable computations
- The approach and methodology presented in the course precludes the use of ad-hoc and problem dependent approaches such as SUPG, SUPG/DC, SUPG/DC/LS and their many variations that have no mathematical and physical basis
- Choices of minimally conforming approximation spaces and their impact in error computation and adaptivity enables the methods and techniques presented in the course to yield computed solutions that are as good as the theoretical solutions of the BVPs and IVPs. This feature provides incomparable computational infrastructure to exploit theoretical solutions of various mathematical models incorporating complex physics.

Who Can Attend ?

- Researcher as well as practitioners in the field of computations of the solutions of PDEs.
- Specific students, researchers, postdoctoral fellows in all areas of engineering, applied mathematics, mathematical physics, and those in physical sciences
- Undergraduate degree in engineering, mathematics, or any of applied disciplines of physical sciences.

Important Dates

Last date for receiving applications :
15 May 2016

Intimation to participants :
1 June 2016

Course Dates :
1-11 July 2016

Registration Fee

The participation fees for taking the course is as follows:

Participants from abroad : US $500

Participants from Industry: Rs. 8000/-

Participants from Academic/Research Organizations: Rs 7,000/-

Students and research scholars:Rs.2000/-
(For SC/ST students : Rs 1,000/-)

The above fee includes all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, free internet facility.

The participants will be provided with accommodation and food on payment basis.

To register for the course, visit :
http://www.nitgoa.ac.in/gian/

Course Co-ordinators

Dr. Saidi Reddy Parne

Dr. P. S. Reddy's (born in 1981 in Andhra Pradesh, India) research expertise is on Sensors, Photonics and Renewable energy. Prior to joining NIT Goa, he worked as a sensors specialist at Pricol Technologies limited, Coimbatore. He has obtained his Ph. D from NIT Warangal. He has authored several papers in these areas in reputed journals.
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Dr. Velavan Kathirvelu

Dr. Velavan Kathirvelu is currently an assistant professor in Department of Humanities and sciences at NIT Goa. His research interest includes, distance measurement by EPR spectroscopy, electron spin relaxation of organic free radicals and transition metal ions.

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