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 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.

For more details please contact:
Dr Saidi Reddy Parne
Coordinator - GIAN Course on ACM

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

About Prof. J. N. Reddy

Prof. JN Reddy is a Distinguished Professor and inaugural holder of the Oscar S. Wyatt Endowed Chair in Mechanical Engineering at Texas A&M University, College Station, Texas, USA. Prof Reddy has authored over 450 journal papers and 16 text books on theoretical formulations and finite-element analysis of problems in solid and structural mechanics (plates and shells), composite materials, computational fluid dynamics, numerical heat transfer, and applied mathematics. He is internationally known for his research on mechanics of composite materials and for computational methods. The shear deformation plate and shell theories that he developed and bear his name in the literature are well known, and finite element models he developed have been implemented into commercial software like ABAQUS, NISA, and HYPERFORM. Such an eminent record of research has earned Prof Reddy numerous national and international awards, including the Charles Russ Richards Memorial Award and the Worcester Reed Warner Medal of the American Society of Mechanical Engineers. Prof Reddy presented the prestigious ‘The 2009 Landis-Epic Lecture’ at the University of Pittsburgh, and received Honoris Causa, Honorary degree, from the Technical University of Lisbon, Portugal. Prof JN Reddy can be contacted by email on jn_reddy@yahoo.com and jnreddy@tamu.edu

About Dr. A. Rajagopal

Dr. A. Rajagopal is an Assistant Professor, Dept. of Civil Engineering, IIT Hyderabad.

Dr. A. Rajagopal’s research expertise is on computational in elasticity, finite element and mesh free methods. Earlier to joining IIT Hyderabad he worked as a post doctoral researcher at the Chair of applied mechanics, University of Erlangen, Nuremberg, Germany, under the guidance of Prof. Paul Steinmann. During this time he has worked in the area of polygonal finite element and mesh free methods applied to nonlinear gradient elasticity and phase field simulations. Earlier he has obtained his Ph.D from IIT Madras, on developing Finite Element Mesh adaption techniques based on mechanics of material / configurational forces for plane problems, bimaterial interfaces and composite plates under guidance of Prof. C.S. Krishnamoorthy and Prof M. Sivakumar. He has authored several papers in these areas in leading journals

About Dr. Saidi Reddy Parne

Dr. P.S. Reddy is an Assistant Professor of Physics at NIT Goa.

Dr. P. S. Reddy’s 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.
Many of the mathematical models of natural phenomena are based on funda-
mental scientific laws of physics or otherwise, extracted from centuries of
research on the behavior of physical systems under the action of natural
forces. Today this subject is referred to simply as mechanics - a phrase that
encompasses broad fields of science concerned with the behavior of fluids,
solids, and complex materials. Mechanics is vitally important to virtually
every area of technology and remains an intellectually rich subject taught in all major
universities. It is also the focus of research in departments of Aerospace,
Chemical, Civil, and Mechanical engineering, Engineering Science and Mechan-
ics, as well as applied mathematics and physics. The last several decades have
witnessed a great deal of research in continuum mechanics and its application
to a variety of problems. As most modern technologies are no longer
discipline-specific but involve multidisciplinary approaches, scientists and
engineers should be trained to think and work in such environments. There-
fore, it is necessary to introduce the subject of mechanics to senior undergrad-
uate and beginning graduate students so that they have a strong background in
the basic principles common to all major engineering fields. A course on contin-
uum mechanics is the one that provides the basic principles of mechanics and
prepares engineers and scientists for advanced courses in traditional as well as
emerging fields such as biomechanics and nanomechanics.

Objectives of the Course

The objective of the course is to facilitate an easy understanding of the basic
concepts of continuum mechanics with applications to elasticity, fluid mechan-
ics, and heat transfer. The course presents the main concepts of continuum
mechanics in easy to understand fashion yet mathematically rigorous enough
in providing the invariant form as well as component form of the governing equa-
tions for analysis of practical problems of engineering. In particular, the course
contains formulations and applications to specific problems from heat transfer,
fluid mechanics, and solid mechanics. This course is intended to provide graduate students, engineers, and research-
ers from different disciplines (e.g., Aerospace, Automotive, Civil, Mechanical engineering, Applied physics and Mathematics) as well as materials scientists
with the theory and applications of applied continuum mechanics concepts.

Who can attend?

The course is aimed at students and researchers who are involved with the
formulation and analysis of problems arising in the fields of engineering and
applied science. Participants are assumed to have knowledge of the basic
courses of engineering (i.e., an undergraduate degree in engineering or equiva-
 lent). Prior knowledge of mechanics of materials, statics, and dynamics is an
advantage, but not essential.

Course Contents

Mathematical Preliminaries
- Vector Algebra and Calculus
- Second order tensors
- Coordinate Systems and the Del Operator
- Index notation, principal values of second-order tensors

Descriptions of motion
- Kinematics deformation
- Green and Euler strain measures

Measures of stress
- Stress vector
- Stress tensor
- Cauchy’s formula
- Principal values of stress and strain and principal planes

Conservation of mass
- Eulerian and Lagrangian forms in vector and component forms

Conservation of linear momentum in vector and component forms
- Conservation of angular momentum in vector and component forms
- Conservation of energy in vector and component forms
- Derivation of field equations in cylindrical and spherical coordinate systems

Constitutive models
- Generalized Hooke’s law
- Fourier heat conduction law
- Newtonian fluids

Benefits of attending the course

Persons who have attended the course and followed the material well should
benefit in strengthening their background in the following areas:
- A strong understanding of the fundamental concepts of the measures of
  stress, strain, and constitutive models.
- In-depth understanding of the physical principles of engineering (conservation
  of mass and balance of linear and angular momentum and energy).
- Solution of boundary-value problems of elasticity, fluid mechanics, and heat
  transfer.

Evaluation and Grading

There will be 3 evaluations on the understanding of the concepts by the
participant made during the course. Based on the evaluations finally a letter
grade will be awarded to the participant. A completion certificate shall also be
issued.

The participation fees for taking the course is as follows:
- Participants from abroad: US $500
- Participants from Industry: Rs. 8000/-
- Participants from Academic/Research Organisations: Rs 7,000/-
  (For SC/ST students: Rs. 1000/-)
- Students and research scholars: Rs.2000/-

The above fee includes all instructional materials, computer use for tutorials
and assignments, laboratory equipment usage charges and free internet facility.
The participants will be provided with accommodation and food on payment
basis.

Payment should be made in the form of Demand Draft to be paid in favor of
“The Director, NIT Goa”. The DD together with registration form should be
sent to

Dr. Saidi Reddy Parne,
Coordinator - GIAN course on Applied Continuum Mechanics,
National Institute of Technology Goa
Farmagudi, Ponda, Goa-403 401, India
Phone No.: 0832-2404201, Fax: 0832-2404202
Mobl: 09049 (108036, e-mail: preddy@nitgoa.ac.in

Intimation to participants: 15 November 2016
Course Dates: 15-25 December 2016

Registration

Fee