NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA
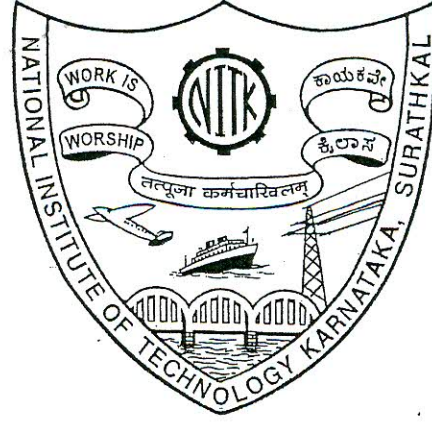SURATHKAL

AGENDA ITEMS (2011)

OF

20th MEETING OF

BOARD OF STUDIES

Date : 31.10.2011 (Monday)
Time : 02.00 PM
Venue : Board Room,
N.I.T.K., Surathkal,
Post Srinivasnagar,
PIN - 575 025.

CONTENTS

20th BOS Meeting to be held on 31.10.2011 (Monday)

AGENDA

Confirmation of minutes of 19th meeting of the BOS held on 13th May, 2011 in the Board Room, NITK.

The minutes of the 19th meeting of the BOS held on 13th May, 2011 in the Board Room, NITK were circulated to all the Members. No comments have been received from any of the Members.

ITEM No: 20-BOS - 1:

Award of Grades for the courses a) EE390 b) EE440 c) EE490 for B. Tech Programme from 2008 Regulation onwards:

The DUGC of the Department of Electrical & Electronics Engineering has proposed the Award of Grades for continuing the earlier practice of S/N grade of the courses a) Professional Practice (EE390) b) Practical Training/Educational Tour (EE440) c) Seminar (EE490) for B. Tech Programme from 2008 Regulations onwards. *[Annexure - I Page No. 5-6]*

The matter is placed before the BOS for discussion and approval.

ITEM No: 20-BOS - 2:

Modified and New Electives in Virtual Instrumentation for M. Tech programme :

The Department of Mechanical Engineering has proposed for the New PG Elective Course. (Lab oriented elective courses, with 2 theory hours and 2 practical hours per week, 3 credits)

The details are enclosed as *Annexure II. [Page No. 11-14]*

ITEM No: 20-BOS - 3:

Modifications in the Curriculum:

The Department of Electronics & Communication has proposed certain changes in the curriculum. The details are appended as *Annexure –III, [P. No. 15-17]*

The matter is placed before the BOS for discussion and approval.

ITEM No: 20-BOS - 4:

Approval of course structure and curriculum for a new Post graduate Programme:

The Department of Mechanical Engineering has proposed to the Approval of course structure and curriculum for a new Post graduate Programme M.Tech (Design & Precision Engineering) in Mechanical Engineering Department. *[Annexure - II, Page No. 18-32]*

The matter is placed before the BOS for discussion and approval.

ITEM No: 20-BOS - 5:

Renaming the course "Practice and Theory of Literacy Research":

The DRPC of the Department of Humanities, Social Sciences and Management (HSM) has resolved to recommend that the course "Practice and Theory of Literary Research" (HU 802) be renamed as "Research Methodology in Literature". The course outline and prescribed texts are appended as *Annexure – IV. [P. No. 33-36]*

The matter is placed before the BOS for discussion and approval.

ITEM No: 20-BOS - 6:

Additional / Co- guide to Ph. D Scholar:

The Department of Mechanical Engineering has proposed that Dr. Raviraj Shetty, Associate Professor, of MIT, Manipal be considered for inclusion as additional Research Guide for Mr. Goutham D. Revankar (ME09p11) in the department of Mechanical Engineering. The CV is enclosed as *Annexure II [Page No-37-49]* for reference.

The matter is placed before the BOS for discussion and approval.

ITEM No: 20-BOS - 7:

A proposal to introduce "Qualifying Examination" a Pre-Ph.D. Comprehensive examination:

The Department of Mechanical Engineering has proposed to introduce "Qualifying Examination" a Pre-Ph. D. Comprehensive examination (similar to IITs). *(Annexure – II, P. No. 50)*

The matter is placed before the BOS for discussion and approval.

ITEM No: 20-BOS - 8:

Changes to be made in the M. Sc Project Courses taken by the students in III and IV semester:

The DPGC of the Department of Physics has proposed that the necessary changes to be made in the M. Sc Project Courses PH 898 M. Sc project I (3rd Sem) 8 credits and PH 899 M. Sc project II(4th Sem) 12 credits taken by the students in III and IV semester.

The details are attached. *[Annexure – V, Page No. 51-52]*

The matter is placed before the BOS for discussion and approval.

ITEM No: 20-BOS - 9:

Modification in the Curriculum:

Dr. K. C. Shet, Dean (FW) has proposed certain changes in the Curriculum.

The details are attached as *Annexure VI [Page No-53].*

The matter is placed before the BOS for discussion and approval.

ITEM No: 20-BOS - 10:

Admission to M. Tech Program:

Dr. K. C. Shet, Dean (FW) has proposed certain changes in the M. Tech admission. Details are appended as *Annexure VI [Page No. 54]*

The matter is placed before the BOS for discussion and approval.

***

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA
SURATHKAL, P.O. SRINIVASNAGAR-575025

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGG.

Dr. K. Panduranga Vittal
Professor and Head

Ref. No. EED/ 473 /2011   Date: 19-10-2011

To

Mr. K. Ravindranath
Dy. Registrar (Academic) /
  Secretary, BOS
NITK, Surathkal.

Sir,

Sub: Agenda item for BOS Meeting scheduled on 31-10-2011.
Ref: Meeting Notice No. NITK/BOS-2011/DR dt. 11-10-2011

With reference to the above, please find herewith the agenda item regarding Award of Grades for the courses (a) Professional Practice(EE390) (b) Practical Training/Educational Tour (EE440)(c) Seminar (EE490) for B.Tech. Programme from 2008 Regulations onwards. The copy of DUGC resolution on this matter is enclosed herewith. I request you to place this agenda during the meeting of BOS on 31-10-2011 for necessary action.

Thanking you,

Yours sincerely,

(K.P. Vittal)
Professor and Head
Dept. of Electrical & Electronics Engg.
NATIONAL INSTITUTE OF TECHNOLOGY
KARNATAKA, SURATHKAL
Mangalore - 575 025. (D.K.)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
NATIONAL INSTITTUE OF TECHNOLOGY KARNATAKA, SURATHKAL

Proceedings of DUGC meeting held on 14 October 2011

Agenda Item : Award of Grades for the courses (a) Professional Practice (EE390) (b) Practical Training / Educational Tour (EE440) (c) Seminar (EE490)for B.Tech programme from2008 Regulations onwards.

In the 2007 B.Tech Curriculum, the Courses (a) Professional Practice (b) Practical Training / Educational Tour (c) Seminar were listed in Mandatory Learning Courses Category and awarded with S/N grade. In 2008 B.Tech Curriculum, the above courses were shifted to Programme Core Category.
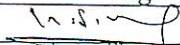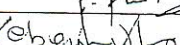
Since the above courses are of such nature where in evaluation is not possible to arrive at relative grading and award of double letter grade, award of S/N grade is most appropriate as it was being practiced upto 2007 regulations, which ensures natural justice to the student.

B.O.S / Senate may be requested to favourably decree in this regard.

Resolution of DUGC :

Resolved to request B.O.S / Senate to issue directions with respect to award of continuing the earlier practice of award of S/N grade to the Courses (a) Professional Practice (b) Practical Training / Educational Tour (c) Seminar for B.Tech Programme from 2008 Curriculum onwards.

Signature of DUGC Members

Sl No.	Name		Signature
1	Prof. K.P. Vittal	Chairman	
2	Prof. Udayakumar R Y	Member	
3	K. Manjunatha Sharma	Member	
4	H. Girisha Navada	Member	
5	Dr. P. Parthiban	Member	
6	Dr. Debasisha Jena	Member	
7	Dr. D. N. Gaonkar	Secretary	

Mechanical Engineering Department
National Institute of Technology
Karnataka, Surathkal
Mangalore 575 025, DK
Phone: 0824 2474000 Ext 3049,
mechodnitk@gmail.com

Dr. G. C. Mohan Kumar
Professor & Head

To
The Dean (Acad)
NITK Surathkal

Dear Madam,
   Sub: Agenda items for BOS meeting

   With reference to the above, I wish to furnish the details for the above said meeting agenda items for the discussion.

1. M.Tech.(Design & Precision Engg) course structure and syllabi
2. Proposal for Ph.D. Comprehensive examination
3. Modified and New Electives in Virtual Instrumentation for M.Tech programme
4. Additional/ co-guides to existing Ph.D. scholars

Thanking You,

Yours faithfully,

25/10/2011

Dr. G C Mohan Kumar
Professor & Head
Dept. of Mechanical Engineering
National Institute of Technology Karnataka, Surathkal
Srinivasnagar - 575 025, Mangalore (INDIA)

DPGC- Meeting is convened on 19-10-2011 at 12 noon to discuss PG academic matters. The following members are present.

1. Dr. G C Mohan kumr.   _Mhaal._
2. Dr. T.P. Ashok Babu   _Ashok Babu._
3. Dr. Shrikantha Rao   _Sreekantha_
4. Mr. H. Shivananda Nayaka   _Nayaka_
5. Mr. Suresh Kumar Y   _Suh Cu?_
6. S.M. Kulkarni   _tv_
7. K.V. Gangadharan   _Ganth L_
8. P. Mohanan   _Mo an_
9. G.N.KUMAR   _G.N.Ka_

① Discussions - New P.G. Program in Design & PE con be started with the strengthy of faculty and laboratory set up. Recommend to place in the Bos.

② DPGC recommends the termination of Regn. of Mr. Abishek Kumr Yadaw (FH09F02) with the

- recommendation of DPAE.

③ DPGC recommends to conduct MTech (Research) Viva-voce Exam. to Mr. Aerope Narghaare

④ DPGC recommends the Extension of MTech(R) Student Mr. Atma Sudheer Setty. for six mnths.

⑤ New PG elective Course in Virtual Instrumentation proposed be placed in Bos for approval.

Mhaal.
19-10-11
Dr. G C Mohan Kumar
Professor & Head
Dept. of Mechanical Engineering
National Institute of Technology Karnataka, Surathkal
Srinivasnagar - 575 025, Mangalore (INDIA)

DRPC meeting is convened on 29-09-2011 at 4 pm to discuss Academic-Research matters. The following members are present.

1. Dr G C Mohan kumar.
2. Prasad Krishna.
3. Dr. Mirvin Hebri.
4. Dr. Vijay Desai
5. P. Mohanan
6. Dr S. M. Murigendrappa
7. Dr. Narendranath. S
8. Dr. KUMAR. G. N
9. Dr. K.V. Gangadharan
10. Shrikantha S Rao

① **Agenda:** Annual Progress Report of PhD full Time Scholars after one year of registration whether for Part Time Scholars. Too?

   a: Detailed Report at the mid of year in addition to RPAC Report — July/December (of Prev Week)

   b: Report format by a Committee with DRPC Secretary, chairman DRPC, Prof. Mohanan Rg KVC)

a for ~~App~~ Part Time and Full Time

   All Supervisors Should Sign.

② Updating Data Base of Research Scholars.
A notice on defaulters will be notified for Students/Supervisors — 7 Oct 2011

③ Qualifying Examination for PhD Scholars.

④ Monthly & Report for award of Fellowship
— Report forwarded by supervisor to He.D for ~~award~~ award of fellowship. (Format for Dr (S. N. Kumar)

⑤ Letter recvd for Dr Narendranath regarding termination of Candidature of Mr. Muralidhar Lakkaraju, full Time Ph.D Scholar in the dept.

The DRPC deliberated at length and decided to seek advice from the Dean (Acad) before further actions.

Secretary, DRPC   29-9-2011

Chairman, DRPC   29/9/2011

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Department of Mechanical Engineering, NITK Surathkal

Proposal for New PG Elective course

(Lab oriented elective courses, with 2 theory hours and 2 practical hours per week, 3 credits)

Proposer:	Dr. K V Gangadharan, Mechanical Engineering Department
Intended user:	Mechanical PG + Mechanical UG + Research Scholars
Maximum class strength:	20 (as per presently available lab facility), can be offered in both semesters to benefit more students
Lab facility:	**Centre for System Design** {Centre of Excellence (COE) under an MOU with M/s National Instruments}
Course offering by:	**Mechanical Engineering**

Three new lab oriented electives course at PG level have been proposed and one old course has been proposed to modify. These courses are for Mechanical PG and research students and for limited number of Mechanical B Tech students. Maximum of 20 students can be accommodated with the present facility at **Centre for System Design**. These courses will be offered by Mechanical Engineering Department and will be making used of facilities created at **Center for System Design**, COE under a MOU with M/s. National Instruments, Ltd.

The course registration is purely based on the evaluation of the students by the course Instructor on the prerequisites for each course

New course

1. ME 826 Experimental techniques in Vibration Analysis   (2- 0-2) 3
2. ME 827 Experiments with virtual Instrumentation   (2- 0-2) 3
3. ME828 Experiments with Sensors , Actuator and DAQ   (2- 0-2) 3

Modification of existing PG elective Course

1. ME 825   Virtual Instrumentation   (2-0-2) 3
   Modification: (3-0-0) 3 credit to (2-0-2) 3 credit, Lab component has been added and content revised

1. ME 826 Experimental techniques in Vibration Analysis (2- 0-2) 3

Basics of Mechanical Vibration. Idealization of complex real world system to single degree of freedom system and Multi degree of freedom systems. Determination of Impulse response, sweep sine / harmonics excitation response of simple mechanical systems. Vibration measurement and instrumentation

Lab component

Experimental identification of natural frequency of simplified real world system, Experimental methods of system identification (find M, K and C of a real world system), Determination of damping in a given system, Impulse response analysis of continuous systems, Harmonic

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response of mechanical simple systems, Signature analysis of rotating machines, Passive, semi active and active vibration control

Reference

1) **Willam T Thomson** et. al, Theory of Vibration with Applications, Fifth Edition, Pearson Education.
2) **Leonard Meirovitch**, Elements of Vibration Analysis, 2nd Edition, McGrawHill Book Company
3) **Sanjay Gupta**, Joseph John Virtual Instrumentation Using Lab VIEW Tata MaGraw-Hill (2005)
4) **J.P. Holman**, Experimental Methods for Engineers McGrawHill, 6 th Edition(2000)

Prerequisites:

ME302 Measurement Instrumentation and Control or equivalent course

ME351 Machine dynamics and vibration or equivalent course

The course registration is purely based on the evaluation of the students by the course Instructor on the prerequisites for each course

2. ME 827 Experiments with virtual Instrumentation (2- 0-2) 3

Fundamentals of Virtual instrumentation. Basics of graphical system design. LabVIEW programming. Data Acquisition Systems and Signal Conditioners. Basics of sensors and actuators and its characteristics.

Lab Component

Basic data acquisition and Digital signal processing, Use of different sensors and actuators

Analog and digital control of actuators, Simple on of Control, Implementation of PID control

Integration of traditional instruments with Virtual Instrumentation setup, Remote triggered experiments

Reference

1) **Sanjay Gupta**, Joseph John Virtual Instrumentation Using Lab VIEW Tata MaGraw-Hill (2005)
2) D Patranabis, Sensors and Transducers, Phl 2 nd Edition (2003)
3) James H McClellan, DSP First A Multimedia Approach , Printice Hall International (1999)
4) Academic References www.ni.com
   ### Prerequisites:
   ME302 Measurement Instrumentation and Control or equivalent course
   Understanding use of traditional instruments

The course registration is purely based on the evaluation of the students by the course Instructor on the prerequisites for each course

3. ME828 Experiments with Sensors , Actuator and DAQ (2- 0-2) 3

Basics of sensors and signal conditioning, Basics of actuation and its control, LabVIEW programming , Data Acquisition systems, Fundamentals Digital Signal processing

Lab components

Measurement of following parameter using sensors, Temperature, Pressure, strain, force, displacement, Acceleration, rotation, torque. Actuators: DC motor control, stepper motor control, Servo motors . PWM generation and control, Implementation of simple control systems

Reference

1) **J.P. Holman**, Experimental Methods for Engineers McGrawHill, 6 th Edition(2000)
2) **James H McClellan**, DSP First A Multimedia Approach , Prentice Hall International (1999)
3) **Sanjay Gupta**, Joseph John Virtual Instrumentation Using Lab VIEW Tata MaGraw-Hill (2005)
4) **D Patranabis**, Sensors and Transducers, Phl 2 nd Edition (2003)

Prerequisites:

ME302 Measurement Instrumentation and Control or equivalent course

Clarity on basics of sensors and actuators and its applications

The course registration is purely based on the evaluation of the students by the course Instructor on the prerequisites for each course

4. ME 825 Virtual Instrumentation   (2-0-2) 3 (old course with modification)

Introduction to virtual instrumentation and its evolution, Basics of graphical programming and LabVIEW, Introduction to graphical system design, Basics of Data acquisition, Digital Signal processing and signal manipulation. Sensor and actuators, its characteristics, Advances in sensing technology and DAQ

Lab component:

LabVIEW programming, Data collection from sensor inputs, Basic Digital signal processing of complex real world signals, Application of filters, Implementation of Simple controls logics

Interfacing traditional instruments with Lab VIEW, Remote triggered experiments

Reference

Sanjay Gupta, Joseph John Virtual Instrumentation Using Lab VIEW Tata MaGraw-Hill (2005)

D Patranabis, Sensors and Transducers, Phl 2 nd Edition (2003)

J.P. Holman Experimental Methods for Engineers McGrawHill, 6 th Edition(2000)

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Academic Resources from ww.ni.com

Prerequisites:

ME302 Measurement Instrumentation and Control or equivalent course

Clarity on basics of sensors and actuators and its applications

The course registration is purely based on the evaluation of the students by the course Instructor on the prerequisites for each course

DEPT OF ELECTRONICS & COMMUNICATION ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL
P.O. SRINIVASNAGAR, MANGALORE-575025
KARNATAKA, INDIA

Dr. Muralidhar Kulkarni

Professor & Head

No. NITK/EC/BOS/784/2011

To

The Dean (Academic)   21.10.2011
NITK, Surathkal

Sub: Agenda Items from E & C department for the ensuing BOG to be held on 31.10.201

Dear Madam,

Please find the following agenda items from E & C department, to be included for the ensuing BOG to be held on 31.10.2011. The same have been approved by the Faculty Council of E & C department in their faculty meeting No.34 held on 21.10.2011.

1. To *do away* with the minimum CGPA requirements specified under the head of degree requirements of a student of the MTech degree program (Section 4.1 (a) part (ii) on page No.7 of the PG/Research Curriculum Regulations 2009.

2. To allow a student who has secured an FF grade in a subject a maximum of two attempts over a period of one year, failing which the student will be required to re-register for the particular course.

Thanking You,

Yours sincerely,

21/10/2011

(Muralidhar Kulkarni)

प्राध्यापक एवं विभागाध्यक्ष
ऋणविद्युतीय एवं संचार अभिचांत्रिकी विभाग
राष्ट्रीय प्रौद्योगिकी संस्थान कर्नाटक, सुरतकल
पी.ओ. श्रीनिवासनगर, मंगलूर - 575 025, कर्नाटक, भारत
Professor & Head
Department of Electronics & Communication Engineering
National Institute of Technology Karnataka, Surathkal
P.O. Srinivasnagar, Mangalore - 575 025, KARNATAKA, INDIA

DR – Acad
BoS Agenda
24.10.11

FACULTY MEETING

EC-FAC-MTG:34/ 21st October 2011
Venue: Dept. Conference Room.
Time: 11.45 AM

Minutes of meeting

Agenda Items placed before the Faculty Council of E&C Dept.:

Agenda Item 1
BOS Agenda Items to be communicated to Dean(Academic)
Agenda Item 2
Regarding forwarding of QIP applications for PhD
Agenda Item 3
Regarding forwarding of Child Care Leave Applications
Agenda Item 4
Regarding subjects allocation for next semester-Open Elective ·
Agenda Item 5
Under any other matter:
NBA accreditation preparation for PG programs

Decisions made:

1. BOS Agenda Items to be communicated to Dean(Academic)
   It was resolved that:
   - To *do away* with the minimum CGPA requirements specified under the head of degree requirements of a student of the MTech degree program (Section 4.1 (a) part (ii) on page No.7 of the PG/Research Curriculum Regulations 2009.
   - To allow a student who has secured an FF grade in a subject a maximum of two attempts over a period of one year, failing which the student will be required to re-register for the particular course.
2. It was resolved to forward the QIP application for PhD submitted by Mr.Joseph Anthony.
3. It was decided to forward the child care leave application of Mrs.Rekha Bhat effective from January 2012 to July 2013. Other requests for similar leave will be entertained only after Mrs. Rekha Bhat rejoins the department.
4. It was resolved to allocate a minimum of one theory course per year to the full time research scholars (PhD) drawing Institute/QIP scholarship. In addition, it was also resolved to allocate a minimum of one theory course per year to the MTech by research drawing scholarship if required.

5. Prof. M S Bhat and Dr. T. Laxminidhi will prepare the documentation required for NBA accreditation of the MTech(VL) program before December 31,2011.
6. Dr. John D "Souza and Mr. NSV Shet will prepare the documentation required for NBA accreditation of the MTech(CE) program before December 31,2011.

Members of E&C Dept. Faculty council:

Name of the faculty	Signature
Dr. Sumam David S	
Dr. Muralidhar Kulkarni	
Dr. M. S. Bhat	
Dr. U. Sripati	
Mr. Ramesh Kini M	
Dr. John D'souza	
Dr. Laxminidhi T	
Mr. N. Shekar V Shet	
Ms. Rekha S	
Ms. Kalpana G Bhat	
Ms. Aparna Dinesh	
Mr Joseph Antony	
Mr. Krishnamoorthy K	

Department of Mechanical Engineering, NITK Surathkal, Mangalore

Proposal to start a New Post Graduate programme in Design & Precision Engineering by the Department of Mechanical Engineering in Collaboration with CMTI, Bangalore

In accordance with the objectives and scope of the MoU entered on 4th March 2011, between NITK Surathkal and CMTI Bangalore, a collaborative academic programme leading to *M.Tech. Degree in Design & Precision Engineering* is proposed. The curriculum and syllabi was discussed at length with the scientists of CMTI Bangalore and the Faculty members of Mechanical Engineering as well as experts from the precision engineering industries. The objectives of the proposed M. Tech. Programme along with its curriculum and syllabi as per the NITK academic rules and regulation for PG programmes are placed at **Annexure -I.**

It is intended to launch this programme from the next academic year 2012-13 with a student intake of 15. First year course work of the programme will be conducted at NITK while the project work in the second year will be performed at the Precision Engineering-Manufacturing and Metrology facilities of CMTI Bangalore.

The faculty in the Department of Mechanical Engineering shall teach courses in the area of Design and Precision Engineering while scientists from CMTI Bangalore shall deliver a few modules of precision Engineering. A financially viable revenue model shall be worked out for mutual benefits of NITK and CMTI upon formal approval of the PG Programme by the authorities concerned.

Motivation:

New engineered products come about from a fusion of creativity with sound knowledge of engineering science. One of the major challenges facing the technical education system in the country as reported during a review by leading External Quality Assurance Agencies (EQAs) is the lack of design capability especially creative design ability of our students and graduates. One of the attributes of a global engineer as defined by the International Engineering Alliance (for Washington Accord Graduate profile) is, to "Design solutions for complex engineering problems and design systems, components or processes that meet

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specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations." To meet the industry's need for trained engineers in the specialized field and to create a talent pool that can be tapped an advanced programme in mechanical design and precision engineering with strong industry interface is envisaged.

Mechanical Design and Precision Engineering is the profession in which knowledge of the applied mathematical, natural sciences and with fundamental mechanical sciences gained by higher education, experience, and practice is devoted to the application of engineering principles and the implementation of technological advances for the benefit of humanity. The programme provides the opportunity to demonstrate and apply knowledge successfully to meet engineering challenges, function competently in multidisciplinary teams, communicate clearly and effectively, and understand professional, legal and ethical responsibility. Aims to meet the industry's need for trained engineers in the specialized field and to create a talent pool that can be tapped an advanced programme in mechanical design and precision engineering with strong industry interface is envisaged.

To provide education and to equip our Post graduates with a strong technical and scientific foundation that treats Mechanical design and precision engineering as a system and integrates the areas of manufacturing processes, engineering materials, product design, automation, and manufacturing management. Also to deliver products, services, and support to both internal and external organizations by applying technical knowledge, problem solving techniques and hands-on skills in traditional and emerging areas of manufacturing.

Objectives of the Programme

1. To develop the knowledge and technical skills required to be and to remain productive in the field of Mechanical Design.
2. Apply basic and contemporary science, engineering, and experimentation skills to identify manufacturing problems and developing practical solutions to precision engineering.

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3. To use knowledge of mathematics, and engineering principles to analyze models of Design and precision engineering Systems.

4. Provide ability to establish systems to plan and control the manufacturing of products using modern methods.

5. Design, analyze, build, and test virtual or real models in product development and continuous improvement environments.

6. Understand professional and ethical responsibilities and the impact of engineering towards societal and global context.

7. Ability to provide comprehensive preparation for careers in Design Engineering.

Placement opportunities:

Post Graduates of the Mechanical Design and Precision Engineering program are highly sought by prestigious firms. They may find challenging positions in process engineering/design improvement, quality assurance production planning and management, product and, manufacturing supplier training, facilities design, etc.

Placement opportunities in the automobile sectors such as (TVS, Ashok Leyland, Bajaj, Hyundai, Tata, Mahindra, Ford, and General Motors), Machine tools/ Manufacturing Sector (ACE Manufacturing systems, BFW, LMW), Software Design (Caterpillar, Proctor & Gamble, Tata Elexsi, TCS, Honey well, Wipro), Aerospace (Boeing Snecma, Good Rich, Airbus), Public Sectors (BEML, HAL, BHEL, SAIL) and heavy and light equipment manufacturers.

Dr. G C Mohan Kumar
Professor & Head
Dept. of Mechanical Engineering
National Institute of Technology Karnataka, Surathkal
Srinivasnagar - 575 025, Mangalore (INDIA)

New Post Graduate Programme in Design & Precision Engineering

by the Dept. of Mechanical Engg, NITK in Collaboration with CMTI, Bangalore

Admission: A full time Engineering Student with GATE valid Score is eligible to the course proposed. One sponsored seat is reserved to the candidate, working in an industry or research institute with a minimum of 2 years of regular service. (Preference will be given to scientists of CMTI, Bangalore)

Eligibility: A minimum eligibility criterion for admission is same as for other M.Tech Programmes in the Institute.

Seat Matrix:

Degree	GM	OBC	SC	ST	SPONSORED	TOTAL
Mechanical Engineering	5	2	1	1	1	10
Industrial Production & Engineering	3	1	1	0	0	5
	8	3	2	1	1	15

Regulations and & Requirements: All regulations and requirements to award degree is same as Regulations for the Post graduate Degree programmes in NITK Surathkal is application to this programme.

Annexture -1
M.Tech Programme in Mechanical Design and Precision Engineering

Semester			
I	**II**	**III**	**IV**
ME 700 Analysis, Synthesis and Design of Mechanisms	MA 713 Mathematical Methods For Engineers	ME 891 Practical Training/ ME 898 Minor Project	ME 899B Major Project-II
ME701 Design Engineering	ME705 Design Principles of Precision Systems	ME 899A Major Project-I	
ME702 Computational Mechanics of Materials	ME706 Precision Engg. Lab		
ME 703 Principles of Precision Engineering	ME 890 Seminar		
ME 704 Design Engg Lab	Elective 3		
Elective 1	Elective 4		
Elective 2	Elective 5		

Programme Core (Pc)
ME 700 Analysis, Synthesis and Design of Mechanisms (3-0-0) 3
ME 701 Design Engineering (3-0-0) 3
ME 702 Computational Mechanics of Materials (3-0-0) 3
ME 703 Principles of Precision Engineering (3-0-0) 3
ME 704 Design Engg Lab (0-0-2) 1
ME 705 Design Principles of Precision Systems (3-0-0) 3
ME 706 Precision Engg. Lab (0-0-3) 2
MA 713 Mathematical Methods For Engineers (3-1-0) 3

Elective courses (Ele) (3-0-0) 3

ME 800 Finite Element Analysis
ME 801 Design of Mechatronics Systems
ME 802 Industrial Tribology
ME 803 Optimization Methods in Engineering Design
ME 804 Experimental Stress Analysis
ME 805 Micro Electro Mechanical Systems Design
ME 806 Fluid Power Control
ME 807 Design of Material Handling Equipments
ME 808 Nanotribology
ME 809 Materials Selection in Mechanical Design
ME 810 Applied Elasticity

ME 811 Vibration Analysis and Diagnostics
MA 702 Design and Analysis of Experiments
ME 812 Composites Mechanics & Processing
ME 813 Theory of Metal Forming Plasticity
ME 814 Modern Control Engineering
ME 815 Fracture Mechanics
ME 816 Rapid Manufacturing Technology
ME 817 Product Design & Rapid Prototyping
ME 818 Human Factors in Design

Mandatory Learning Courses (MLC)
ME 890 Seminar (2)
ME 891 Practical Training/ ME 898 Minor Project (2)

Major Project (20)
ME 899 Major Project (3rd and 4th Sem)

Credit Requirements:

Category	Minimum credits to be earned
Programme core	21
Elective courses	15
Mandatory learning courses	04
Major project-I and II	20
Total	60

ME700 ANALYSIS, SYNTHESIS AND DESIGN OF MECHANISMS (3-0-0) 3

Mobility Analysis – degree of freedom (DOF) mixed mobility, total, partial and fractional DOF, closed and open chain systems, structural analysis and synthesis of mechanisms. Alternative design solutions, coding, evaluation and selection of optimum mechanism, type synthesis, number synthesis and design of mechanisms. Indexes of merit, graphical, algebraic and optimization techniques, matrix methods of design and analysis, design of function, path and motion generators, structural and mechanical error, design and analysis using software like ADAMS. Manipulators – Classification, actuation and transmission systems, coordinate transformation – DH notations, inverse and forward kinematics, manipulator dynamics from Lagrange and Newtonian point of view.

Kenneth J. Waldron and Gary J. Kinzel Kinematics- Dynamics, and Design of Machinery, Second Edition, , John Wiley & Sons, Inc., 2004
R.L. Norton -Design of Machinery, Fourth Edition, McGraw Hill, 2007
Joseph E. Shigley and John J. Vicker, Jr- Theory of Machines and Mechanisms," Second Edition,., McGraw Hill, 1995
W.L. Cleghorn- Mechanics of Machines, Oxford University Press, 2005
George N Sandor and Arthur G Erdman- Mechanism Design Vol – 1, 2; Prentice Hall.
Arthur Erdman -Mechanisms & Machines (Analysis & Synthesis)
Amitabha Ghosh and AK Mallik -Theory of Mechanism and Machines; EWLP, Delhi.

ME701 DESIGN ENGINEERING (3-0-0) 3

 Design Process: The Design Process- Morphology of Design - Design drawings - Computer Aided Engineering - Designing of standards - Concurrent Engineering - Product life cycle - Technological Forecasting - Market Identification - Competition Bench marking - Systems Engineering - Life Cycle Engineering - Human Factors in Design - Industrial Design. DESIGN Methods: Creativity and Problem Solving - Product Design Specifications - Conceptual design - Decision theory - Embodiment Design - Detail Design - Mathematical Modeling - Simulation - Geometric Modeling - Finite Element Modeling - Optimization - Search Methods - Geometric Programming - Structural and Shape Optimization. Material Selection Processing And Design: Material selection Process - Economics - Cost Vs Performance - Weighted property Index - Value Analysis -Role of Processing and Design - Classification of Manufacturing Process - Design for Manufacture - Design for Assembly - Design for castings, Forging, Metal Forming, Machining and Welding - Residual stresses - Fatigue, Fracture and Failure.

Dieter George E., engineering Design -A Materials and Processing Approach, McGraw Hill, International Edition Mechanical Engg ., Series ,1991.
Karl T. Ulrich and Steven Deppinger, Product Design and Development, McGraw Hill, Edition 2000.
Ray .M.S., Elements of Engg. Design, Prentice Hall Inc. 1985.
Suh .N.P., The Principle of Design, Oxford University Press, NY. 1990.
Palh .G. and Beitz .W., Engineering Design, Springer - Verlag, NY. 1985.

ME702 COMPUTATIONAL MECHANICS OF MATERIALS (3-0-0) 3

The primary focus of this course is on the teaching of state-of-the-art computational methods for the modeling and simulation of the mechanical response of engineering materials used in aerospace as well as in other branches of engineering including mechanical and civil engineering, material science and biomechanics. The range of material behavior considered includes: finite deformation elasticity and inelasticity, contact, friction and coupled problems. Numerical formulation and algorithms include: Variational formulation and variational constitutive updates, finite element discretization, mesh generation, error estimation, constrained problems, and time discretization and convergence analysis. There will be a strong emphasis on the (parallel) computer implementation of algorithms in programming assignments. At the beginning of the course, the students will be given the source of a base code with all the elements of a finite element program which constitute overhead and do not contribute to the learning objectives of this course (assembly and equation-solving methods, etc.). Each assignment will consist of formulating and implementing on this basic platform, the increasingly complex algorithms resulting from the theory given in class, as well as in using the code to numerically solve specific problems. The application to real engineering applications and problems in engineering science will be stressed throughout.

Marsden, J. E., and T. J. R. Hughes. Mathematical Foundations of Elasticity, Prentice-Hall, 1983.
Malvern, L. E. Introduction to the Mechanics of a Continuous Medium. Prentice-Hall, 1969.
Gurtin, M. E. An Introduction to Continuum Mechanics. Academic Press, 1981.
Hughes, T. J. R. The Finite Element Method, Linear Static and Dynamic Finite Element Analysis.
Dover.Zienkiewicz, O. C., and R. L. Taylor. The Finite Element Method. Mc-Graw Hill, 1989.
Bathe, K. J. Finite Element Procedures. Prentice Hall, 1996.

ME 703 PRINCIPLES OF PRECISION ENGINEERING

Introduction to Precision Engineering: Need for having a High Precision, Four Classes of Achievable Machining Accuracy, Precision Machining, High-precision, Ultra-precision Processes and Nanotechnology. Tool Materials for Precision Machining: Coated and Laminated Carbides, Ceramics, Diamonds, Cubic Boron Nitride. Mechanics of Materials Cutting: Overview of the Turning Operation and Tool Signature & Mechanics. Ultra-Precision Machine Elements: Guide-ways, Drive Systems, Friction Drive, Linear Motor Drive, Spindle Drive. Rolling

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Element, Hydrodynamic and Hydrostatic Bearings: Principle of Rolling Element Bearings, Design & Selection, Bearing Life, Construction of Lubricated Sliding Bearings, Principle of Hydrodynamic Bearings, Hydrodynamic Thrust Bearings. Hydrostatic Bearings: Design of Hydrostatic Bearings, Hybrid Fluid Bearings Gas Lubricated Bearings: Aerostatic Bearings, Operation of Aerostatic Bearing Systems, Aerostatic Spindles, Hybrid Gas Bearings Micro-electro-Mechanical Systems (MEMS): Characteristics and Principles of MEMS, Materials and Design of MEMS, Application of MEMS, Fabrication and Micro-manufacturing Processes, Bulk Micromachining, Surface Micromachining, LIGA Process, Clean Rooms, Design and Construction of Clean Rooms

V.C.Venktesh, Precision Engineering, Tata Mc.Graw Hill, New Delhi 2007

Boothroyd, G., Fundamentals of Machining and Machine Tools, Marcel Dekker, 1989

Kalpakjian, S., Manufacturing Engineering and Technology. 3rd Edition, Addision-Wesley Publishing Company,New York, 1995.

ME704 DESIGN ENGINEERING LAB I (0-0-3) 2

Geometric Modelling in 3D of machine tool parts using CAD software. 2-D stress analysis using strain gauges and photoelasticty, Kinematic and dynamic simulation of various mechanisms in machines, process simulation, Synthesis of mechanisms, CNC programming-Manual and automatic using CAM software. Simulation of hydraulic and pneumatic systems, Robotics programming

MA713 MATHEMATICAL METHODS FOR ENGINEERS (3-0-0) 3

Revision of Linear Algebra, Linear Transformations, Range and Kernel, Isomorphism, Matrix of transformations and Change of basis. Series Solutions of ODE and Sturm-Liouville Theory: Power series solutions about ordinary point, Legendre equation and Legendre polynomials, Solutions about singular points; The method of Frobenius, Bessel equation and Bessel Functions. Sturm-Liouville problem and Generalized Fourier series. Partial Differential Equations: Second order PDEs, Classifications, Formulation and method of solutions of Wave equation, Heat equation and Laplace equation. Tensor Calculus: Line, area and volume integrals, Spaces of N-dimensions, coordinate transformations, covariant and mixed tensors , fundamental operation with tensors, the line element and metric tensor, conjugate tensor, Christoffel's symbols , covariant derivative.

G. Hadley, Linear Algebra

A. N. Kolmogorov & S. V. Fomin, Elements of the Theory of Functions and Functional Analysis, Addison Wesley

Sokolnikoff and Redheffer – Mathematics of Physics and Engineering. 2nd edition. McGraw Hill, 1967.

S. Sokolnikoff, Tensor Analysis, Wiley, New York, 1966

Marsden, Ratiu, Abraham Manifolds, Tensor analysis, and Applications, Springer

J. L. Synge, Tensor Calculus, Dover Publications (July 1, 1978)

L.A.Pipes and L.R. Harwill: Applied Mathematics for Engineers and Physicists, Mc Graw Hill, 1971

ME705 DESIGN PRINCIPLES OF PRECISION SYSTEMS (3-0-0) 3

This course teaches the student how to design, instrument, and control high-precision, computer-controlled automation equipment, using concrete examples drawn from the photonics, biotech, and semi-conductor industries. Introduction to precision machine design, Principles of accuracy, repeatability and precision. Errors due to geometry, kinematics, thermal expansion, dynamic forces and instrumentation etc. System design considerations in precision engineering. Rolling and sliding contact bearings. Hydrostatic and magnetic bearings. Precision gears, positioning mechanisms and drives. Electromagnetic piezoelectric and fluid actuators. Micro-electro-mechanical systems. Precision measurement and control devices. Three dimensional co-ordinate measuring machines. Surface finish measurement. Precision machining and finishing operations. Assembly and tolerancing. Micromachining systems. Tribological vibrations and noise considerations in high speed mechanical units. Case studies from some of the applications like computer drives, printers, sewing machines, video and audio recorders, optical devices etc.

Alexander Slocum -Precision Machine Design, , Prentice Hall

Smith, S. T., Chetwynd, D. G., *Foundations of Ultra-precision Mechanism Design*, Taylor & Francis, 1992

Nakazawa, H., *Principles of Precision Engineering*, Oxford University Press, Oxford, 1994.

Evans, C. E., *Precision Engineering: An Evolutionary View*, Cranfield Press, Bedford, UK, 1989.

Blanding, D. L., *Exact Constraint: Machine Design Using Kinematic Principles*, ASME, New York, 1999

ME 706 PRECISION ENGINEERING LAB II (0-0-3) 2

Programming and interfacing experiments on target processor/ microcontrollers, Precision measurements, micro actuators, materials characterisation, use of STM, SEM, AFM, MEMS, micromachining and surface integrity studies

ME800 FINITE ELEMENT ANALYSIS (3-0-0) 3

Basic concepts, Finite elements of an elastic continuum displacement approach, Generalization of the finite element concepts-weighted residual and variational approaches. Element types, iso-parametric formulation, numerical integration, Automatic mesh generation schemes. Application to structural mechanics problems: plane stress and plane strains, Axi-symmetric stress analysis, three dimensional stress analyses, bending of beams and plates. Introduction to non-linear material problems, plasticity, creep and Computer procedures for finite element analysis.

> Rao S. S. *"Finite Elements Method in Engineering"*- 4th Edition, Elsevier, 2006.
> P Seshu, *"Textbook of Finite Element Analysis"*-PHI, 2004.
> J.N.Reddy, *"Finite Element Method"*- McGraw -Hill International Edition.
> Bathe K. J. Finite Elements Procedures, PHI.
> Cook R. D., *"Concepts and Application of Finite Elements Analysis"*- 4th Edition, Wiley & Sons, 2003.

ME 801 DESIGN OF MECHATRONICS SYSTEMS (3-0-0) 3

The need for an integrated approach to the design of complex engineering systems involving Electrical, Mechanical and Computer Engineering. This syllabus is formed to create an overall knowledge to the students to Design such complex Mechatronics systems to full fill the Industrial and other requirements. Introduction to Mechatronics system – Key elements – Mechatronics Design process – Types of Design – Traditional and Mechatronics designs – Advanced approaches in Mechatronics - Man machine interface, industrial design and ergonomics, safety. Real-time interfacing – Introduction - Elements of data acquisition and control - Overview of I/O process, Analog signals, discrete signals, and Frequency signals – Over framing. Case studies on Data Acquisition: Introduction – Cantilever Beam Force Measurement system–Testing of Transportation bridge surface materials – Transducer calibration system for Automotive applications – Strain gauge weighing system – Solenoid Force-Displacement calibration system – Rotary optical encoder – Controlling temperature of a hot/cold reservoir – pick and place robot. Case studies on Data Acquisition and control: Introduction – Thermal cycle fatigue of a ceramic plate – pH control system – Dc-Icing Temperature Control system – Skip control of a CD player – Autofocus Camera, exposure control. Case studies of design of mechatronic products – Motion control using D.C.Motor & Solenoids – Car engine management systems. Advanced applications in Mechatronics: Sensors for condition Monitoring – Mechatronic Control in Automated Manufacturing – Artificial intelligence in Mechatronics – Fuzzy Logic Applications in Mechatronics –microsensors in Mechatronics.

> Mechatronics System Design, Devdas shetty, Richard A. Kolk, Thomson Learning Publishing Company, Vikas publishing house, 2001.
> Bolton, -Mechatronics - Electronic Control systems in Mechanical and Electrical Engineering-, 2nd Edition, Addison Wesley Longman Ltd., 1999.
> Brian Morriss, Automated Manufacturing Systems - Actuators, Controls, Sensors and Robotics, Mc Graw Hill International Edition, 1995.
> Bradley, D.Dawson, N.C. Burd and A.J. Loader, Mechatronics: Electronics in Products and Processes, Chapman and Hall, London, 1991.

ME 802 INDUSTRIAL TRIBOLOGY (3-0-0) 3

Introduction-Historical background, Bearing concepts and typical applications. Viscous flow concepts-Conservation of laws and its derivations: continuity, momentum (N-S equations) and energy, Solutions of Navier-Strokes equations. Order of magnitude analysis, General Reynolds equation-2D and 3D (Cartesian and Cylindrical), Various mechanisms of pressure development in an oil film, Performance parameters. ; Boundary Layer Concepts-Laminar and turbulent flow in bearings, mathematical modeling of flow in high-speed bearings. Elastic Deformation of bearing surfaces-Contact of smooth and rough solid surfaces, elasticity equation, Stress distribution and local deformation in mating surfaces due to loadings, methods to avoid singularity effects, Estimation of elastic deformation by numerical methods-Finite Difference ; Method (FDM), Governing equation for evaluation of film thickness in Elasto-Hydrodynamic Lubrication (EHL) and its solution, Boundary conditions. Development of computer programs for mathematical modeling of flow in bearings, Numerical simulation of elastic deformation in bearing surfaces by FDM.

> Mujamdar.B.C "Introduction to Tribology of Bearing", Wheeler Publishing, New Delhi 2001.
> Dudley D.Fulier " Theory and practice of Lubrication for Engineers", New York Company.1998
> Moore "Principles and applications of Tribology" Pergamon press.
> Radixmovsky, "Lubrication of Bearings - Theoretical principles and design" The Oxford press Company, 2000.
> Susheel Kumar Srivasthava "Tribology in industry" S.Chand and Co.

ME803 OPTIMIZATION METHODS IN ENGINEERING DESIGN (3-0-0) 3

Optimization problem formulation - Design variables, constraints, objective function and variable; bounds. Single-Variable ; Single Variable Optimization Algorithm: Bracketing Melliotls Exhaustive Search Method and bounding; Phase Method. ; Region Elimination Methods: Fibonacci Search method and Golden section search method. Gradient based ; methods, Newton - Raphson method, Bisection Method, Secant Method, and Cubic

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Search Method. Computer programs for bounding phase method and golden section search method. ; Multivariable Optimization Algorithms: Direct search methods. Simplex search method and Hooke- Jeeves pattern search method. Gradient based methods- Cauchy's (steepest descent) method and Newton's method. Constrained Optimization Algorithms- Kuhn- Tucker conditions, penalty function. Method, method of multipliers, cutting plane method, Generalized Reduced Gradient method, computer program for penalty function method. Integer programming - penalty function method. Global optimization using the steepest descent method, genetic algorithms and simulated annealing.

R.L Fox, Addison -Optimization methods for Engg. Design – Wesley.

Ram, Van Nostrand.-Optimization and Probability in System Eng

K. V. Mital and C. Mohan- Optimization methods, New age International Publishers, 1999.

S. S. Rao -Optimization - Theory and Application, Willey Eastern.

ME804 EXPERIMENTAL STRESS ANALYSIS (3-0-0) 3

Photo elasticity: Light and Optics as Related to Photo elasticity Behavior of Light, Polarized Light, Plane Polarizers,, Wave Plates, Arrangement of Optical Elements in a Polariscopic, Constructional Details of Diffused Light and Lens - Type. Theory of Photo elasticity: The Stress Optic Law in Two Dimensions at Normal Incidence, Effects of a Stressed Model in a Plane Polariscope, Effects of a Plane Model in a Circular Polariscope with Dark and Light Field Arrangements. Analysis Techniques: Isochromatic Fringe Patterns, Isoclinic Fringe Patterns, Compensation Techniques, separation Techniques, Sealing Model to Prototype Stresses. Three Dimensional Photo elasticity: Locking in Model Deformation Slicing the Model and Interpretation of the Resulting Fringe Pattern, Effective Stresses. The Shear Difference Method in Three Dimensions; Strain Measurement Methods: Basic Characteristics of a Strain Gauge, Types of Shell Gauge, Moire Method of Strain Analysis, Grid Method of Strain Analysis. Electrical Resistance Strain Gauge: Factors Influencing Strain sensitivity in Metallic Alloys, Gauge Construction Temperature Compensation, Factors-Influencing Gauge Section Gauge Sensitivity and Gauge Factor, Correction for transverse Strain Effects, Semiconductor Strain Gauges. Rosette Analysis - three element rectangular Rosette. The Delta Rosettes, the Four Elements. The Delta Rosette, the Stress Gauge, Strain Circuits, Potentiometer Circuits, the Wheatstone Bridge. Brittle Coating Method: Coating Stresses, Failure Theories Brittle Coating Crack Patterns Produced by Direct Loading Brittle-Coating Crack Patterns Produced by refrigeration Techniques, Brittle Coating Crack, Pattern Produced by Releasing the Load, Double Crack Pattern, Crack Detection, Load-Time Relation and Its influence on the threshold Strain Effects of a Biaxial stress Field.

Experimental Stress Analysis - Dally and Riley, McGraw Hill.

Srinath, Lingaiah, Raghavan, Gargesa, Ramachandra and Pant -Experimental Stress Analysis, Tata McGraw Hill.

M.M.Frocht -Photoelasticity Vol I and Vol II, John Wiley and sons.

Kuske, Albrecht and Robertson -Photo elastic Stress analysis- John Wiley & Sons.

Dave and Adams -Motion Measurement and Stress Analysis,

AS. Kobayassin (Ed), Hand Book of Experimental Stress Analysis SEMNCH, II edition.

Sadhu Singh -Experimental Stress Analysis, Hanna publisher.

ME 805 MICRO ELECTRO MECHANICAL SYSTEMS (MEMS) DESIGN (3-0-0) 3

Introduction, History, Development and need of Micro-Electro-Mechanical Systems. Overview of MEMS technology, Different electro-physical processes used for machining – dealing with MEMS materials; relevant non-conventional processes; IC fabrication processes used for MEMS; MEMS sensors and actuators; Mechanical process techniques and process models for micromachining; Fabrication processes and design of the process sequences; Agile Prototyping of design and manufacturing processes in micro-machining and computer based design; Reliability and process control of micro manufacturing processes; Introduction and exposure to nano-technology processes and systems.

Hector J. De Los Santos, Introduction to Microelectromechanical (MEM) Microwave Systems, Artech House, MA, 1999.

Julian W. Gardner, Microsensors – Principles and Applications, John Wiley and Sons, Inc., NY, 1994.

Ljubisa Ristic (ed.), Sensor Technology and Devices, Artech House, MA, 1994.

Randy Frank, Understanding Smart Sensors, 2nd ed., Artech House, MA, 2000.

Paul W. Chapman, Smart Sensors, ISA, NC, 1996.

Iwao Fujimasa, Micromachines – A New Era in Mechanical Engineering, Oxford University Press, NY, 1996.

S.M. Sze (ed.), Semiconductor Sensors, John Wiley and Sons, Inc., NY, 1994.

Sergej Fatikow and Ulrich Rembold, Microsystem Technology and Microrobotics, Springer Verlag, NY, 1997.

ME 806 FLUID POWER CONTROL (3-0-0) 3

Introduction to oil hydraulics and pneumatics, their advantages and limitations. ISO Symbols and standards in Oil Hydraulics and Pneumatics. Recent developments, applications Basic types and constructions of Hydraulic pumps and motors. Ideal pump and motor analysis. Practical pump and motor analysis. Performance curves and parameters. Hydraulic control elements – direction, pressure and flow control valves. Valve configurations,

General valve analysis, valve lap, flow forces and lateral forces on spool valves. Series and parallel pressure compensation flow control valves. Flapper valve analysis and Design. Analysis of valve controlled and pump controlled motor. Electro-hydraulic servo valves – specification, selection and use of servo valves. Electro hydraulic servomechanisms – Electro hydraulic position control servos and velocity control servos. Nonlinearities in control systems (backlash, hysteresis, dead band and friction nonlinearities). Basic configurations of hydraulic power supplies – Bypass Regulated and Stroke Regulated Hydraulic Power Supplies. Heat generation and dissipation in hydraulic systems. Design and analysis of typical hydraulic circuits. Use of Displacement – Time and Travel-Step diagrams; Synchronization circuits and accumulator sizing. Meter-in, Meter-out and Bleed-off circuits; Fail Safe and Counter balancing circuits. Components of a pneumatic system; Direction, flow and pressure control valves in pneumatic systems. Development of single and multiple actuator circuits; Valves for logic functions; Time delay valve; Exhaust and supply air throttling; Examples of typical circuits using Displacement – Time and Travel-Step diagrams. Will-dependent control, Travel dependent control and Time-dependent control, Combined Control, Program Control, Sequence Control, Electro-pneumatic control and air-hydraulic control. Applications in Assembly, Feeding, Metalworking, materials handling and Plastics working.

John Watton, Fundamentals of Fluid Power Control, Cambridge University Press, 2009
Blackburn J F, G Reethof and J L Shearer, Fluid Power Control, New York : Technology Press of M I T and Wiley, 1960
Lewis E E and H Stern, Design of Hydraulic Control Systems New York, McGraw-Hill, 1962
Morse A C, Electro hydraulic Servomechanism, New York, Mc Graw-Hill, 1963
Pippenger J J and R M Koff, Fluid Power Control, New York : McGraw-Hill, 1959
Fitch, Jr E C Fluid Power Control Systems New York : McGraw Hill, 1966
Khaimovitch : Hydraulic and Pneumatic control of machine tools
Merrit : Hydraulic control systems
Thoma Jean U, Hydrostatic Power Transmission, Trade and Technical Press Surrey, England 1964.

ME 807 DESIGN OF MATERIAL HANDLING EQUIPMENT (3-0-0) 3
Introduction, development of material handling technology, design objectives, salient features of design, classification and characteristics of materials, types of industrial transport, classification and working principles of materials handling devices, cranes, design of structural components, i.e. trolley, main girder, auxiliary truss, platform truss, end carriage and mechanical components i.e. wire rope, drum, pulley system, crane hook, brakes and drives of electric overhead travelling crane, stability and luffing motion of jib crane, conveyors, layout and design of components of belt conveyors, capacity and power requirement of screw conveyors, design of apron, gravity, roller and vibratory conveyors, hydraulic conveyors, layout, industrial installation, elevators, design of bucket and swing tray elevators, steel mill cranes, working principles and operations of various types of stripper, charger, ladle and soaking pit cranes, modern trends in the design of material handling devices.

N. Rudenko -Materials Handling Equipments - Peace Publishers
Spivakowsky and V. Dyachke -Conveying Machines - MIR Publishers
Belt Conveyors for Bulk Materials (2nd Ed) by Conveyor Equipment Manufacturers Association
Spivakowsky -Conveyors and Related Equipments - Peace Publishers

ME 808 NANOTRIBOLOGY (3- 0- 0) 3
Introduction to Nano tribology, Nano -mechanics and Materials Characterization, Surface Forces and Nano rheology of Molecularly, Thin Films Interfacial Forces and Spectroscopic Study of Confined Fluids, Friction and Wear on the Atomic Scale, Nanomechanical Properties of Solid Surfaces and Thin Films, Computer Simulations of Nanometer-Scale Indentation and Friction, Mechanical Properties of Nanostructures, Scale Effect in Mechanical Properties and Tribology, Nanoscale Boundary Lubrication Studies. Biomimetics: Lotus Effect, Roughness-Induced Super hydrophobic Surfaces. Measurement Techniques and Applications: Scanning Probe Microscopy, Noncontact Atomic Force Microscopy, Dynamic Modes of Atomic Force Microscopy.

Bhushan, Bharat, Nanotribology and Nanomechanics An Introduction , 2nd ed., 2008,Springer
Bharat Bhushan, Handbook of Micro/Nanotribology, Second Edition, CRC Press, New York,1999
Jianbin Luo, Yuanzhong Hu, Shizhu Wen, Physics and Chemistry of Micro-Nanotribology, American Society for Testing & Materials, 2008.

ME809 MATERIALS SELECTION IN MECHANICAL DESIGN (3-0-0) 3
Design Process-Introduction: materials - history and character; Organizing materials and processes; Matching material to design; Materials Selection Charts, Density and elastic moduli; Stiffness-limited design; Plasticity, yielding and ductility; Strength-limited design; Fracture and fracture toughness; Cyclic loading, damage and failure; Fracture-limited design; Friction and wear; Materials and heat; Using Materials at high temperatures; Conductors, insulators and dielectrics; Magnetic Materials; Materials for Optical Devices; Oxidation, corrosion and degradation; Manufacturing processes; Processing and properties; Materials, processes and the environment process, material and shape selection, the design of hybrid materials, 'eco' selection, and industrial design, Case Studies.

M.F. Ashby, Materials Selection in Mechanical Design, Butterworth Heinemann, 2010
Michael Ashby, Hugh Shercliff, and David Cebon, 2010, Materials: Engineering, Science, Processing and Design (2nd edition)
M.F. Ashby and K. Johnson, Materials and Design, Butterworth Heinemann, 2nd edition, 2010
Ashby & Jones - Engineering Materials Vol 1 & 2, Butterworth Heinemann

ME810 APPLIED ELASTICITY (3-0-0) 3

Introduction: Definition and Notation for forces and stresses. Components of stresses, equations of Equilibrium, Specification of stress at a point. Principal stresses and Mohr's diagram in three dimensions. Boundary conditions .Stress components on an arbitrary plane, Stress invariants, Octahedral stresses, Decomposition of state of stress, Stress transformation. Introduction to Strain : Deformation, Strain Displacement relations, Strain components, The state of strain at a point, Principal strain, Strain transformation, Compatibility equations, Cubical dilatation. Stress -Strain Relations and the General Equations of Elasticity: Generalized Hooke's; law in terms of engineering constants. Formulation of elasticity Problems. Existence and uniqueness of solution, Saint -Venant's principle, Principle of super position and reciprocal thermo. Two Dimensional Problems in Cartesian Co-Ordinates: Airy's stress function, investigation for simple beam problems. Bending of a narrow cantilever beam under end load, simply supported beam with uniform load, Use of Fourier series to solve two dimensional problems. Two Dimensional Problems in Polar Co-Ordinates: General equations, stress distribution symmetrical about an axis, Pure bending of curved bar, Strain components in polar co-ordinates, Rotating disk and cylinder, Concentrated force on semi-infinite plane, Stress concentration around a circular hole in an infinite plate. Thermal Stresses: Introduction, Thermo-elastic stress -strain relations, Thin circular disc, Long circular cylinder. Torsion of Prismatic Bars: Torsion of Circular and elliptical cross section bars, Soap film analogy, Membrane analogy, Torsion of thin walled open and closed tubes. Elastic Stability: Axial compression of prismatic bars, Elastic stability, Buckling load for column with constant cross section.

> *Timoshenko and Goodier, "Theory of Elasticity"-'McGraw Hill Book Company.*
> *T.G.Sitharam" Applied Elasticity"- Interline publishing.*
> *L S Srinath" Advanced Mechanics of Solids "- Tata McGraw Hill Company.*
> *Wang. C. T. "Applied Elasticity".*

ME 811 VIBRATION ANALYSIS & DIAGNOSTICS (3-0-0) 3

Forced Vibration with non harmonic and transient excitation of single degree freedom systems: Fourier analysis, Response to arbitrary loading (Duhamel's Integral), Impulse response, Mechanical shock, Parametric Excitation. Two degree Freedom System, Multi-degree Freedom systems, modal analysis, Matrix iteration Method, Transfer matrix Method, Myklestadt-Prohl Method, Rayleigh's minimum principle, Stodola's Method, Hoizer's Method. Vibrations of Continuous systems governed by wave equation and Euler Bernoulli equation, strings, membranes, rods, beams. Experimental Methods in Vibration Analysis, industrial applications - rotors and other systems, vibration standards. Vibration Monitoring and analysis: Introduction, Machinery signatures, Selection of Transducers. Analysis Techniques, Machine failure modes, Measurement location, Vibration severity criteria, Vibration frequency analysis. Permanent Monitoring, Case studies.

> *Caollacatt Chapman "Mechanical Fault Diagnosis and Condition Monitoring"- Chapman and hall 1977.*
> *S. S. Rao -Mechanical Vibrations, 4th edition, Pearson Education.*
> *L.F.Pau Marcel Deker "Failure Diagnosis and Performance Monitoring".*
> *S. Graham Kelly, Fundamentals of Mechanical Vibration. 2nd edition McGraw Hill.*
> *William T. Thomson, Marie Dillon Dahleh, Chandramouli Padmanabhan, Theory of Vibration with Application 5th edition, Pearson Education.*

MA702 DESIGN AND ANALYSIS OF EXPERIMENTS (3-0-0) 3

Introduction to the role of experimental design; basic statistical concepts; sampling and sampling distribution; Testing of hypotheses about differences in means- randomized designs and paired comparison designs; testing of hypotheses about variances Analysis of variance (ANOVA) —one-way classification ANOVA; analysis of fixed effects model; comparison of individual treatment means; the random effects model; the randomized complete block design Factorial design of experiments; two-factor factorial design-fixed effects and random effects model; General factorial design; analysis of 2k and 3k factorial designs Conforming in the 2k factorial design in 2p block; confounding in the 3k factorial design in 3p block; Fractional replication of the 2k factorial design and the 3k factorial design Regression analysis- Simple and multiple linear regression and hypothesis testing; response surface methodology-the method of steepness ascent : response surface designs for first-order and second-order models. Evolutionary operation (EVOP).

> *Design and analysis of experiments, D.C. Montgomery, 2nd Ed., John Wiley and sons, NewYork, 1984.*
> *Sheldon Ross M., Introduction to Probability and Statistics for Engineers and Scientists, John Wiley*
> *Hogg R.V., Craig A.T. Introduction to Mathematical Statistics, 4th Edition, McMillan*
> *Lawson, J. & Erjavec, J., "Modern Statistics for Engineering and Quality Improvement ", Thomson Duxbury, Indian EPZ edition.*
> *Nibtginertm Diygkas C, Design and Analysis of Experiments". Fifth ed - John Wiley & Sons Inc.*

ME 812 COMPOSITES: MECHANICS AND PROCESSING (3-0-0) 3

Principles of composites, micromechanics of composites. Various types of reinforcements and their properties. Role of interfaces. Fabrication of metal matrix composites: in-situ, dispersion hardened, particle, whisker and fibre reinforced; composite coatings by electro deposition and spray forming. ; Fabrication of polymeric and ceramic matrix composites. Mechanical physical properties of composites, Mechanisms of fracture in composites. Property evaluation and NDT of composites. Wear and environmental effects in composites.

> *Autar K. Kaw -Mechanics of composite materials, CRC Press New York.*
>
> *Rober M. Jones -Mechanics of Composite Materials, Mc-Graw Hill Kogakusha Ltd.*
>
> *Michael W, Hyer -Stress analysis of fiber Reinforced Composite Materials, Mc-Graw Hill International.*
>
> *Krishan K. Chawla -Composite Material Science and Engineering, Springer.*

ME 813 THEORY OF METAL FORMING PLASTICITY (3-0-0) 3

Definition and scope of the subject, Brief review of elasticity, Octahedral normal and shear stresses, Spherical and deviatric stress, Invariance in terms of the deviatoric stresses, Representative stress. Idealised stress-strain diagrams for different material models, Engineering and natural strains, Mathematical relationships between true stress and true strains, Cubical dilation, finite strains co-efficients Octahedral strain, Strain rate and the strain rate tensor. Yield criteria for ductile metal, Von Mises, Tresca, Yield surface for an Isotropic Plastic materials, Stress space, Experimental verification of Yield criteria, Yield criteria for an anisotropic material. Stress - Strain Relations, Plastic stress-strain relations, Prandtl Roeuss Saint Venant, Levy - Von Mises, Experimental verification of the Prandtl-Rouss equation, Yield locus, Symmetry convexity, Normality rule. Upper and lower bound theorems and corollaries. Application to problems: Uniaxial tension and compression, bending of beams, Torsion of rods and tubes, Simple forms of indentation problems using upper bounds. Problems of metal forming: Extrusion, Drawing, Rolling and Forging. Problems of metal forming: Extrusion, Drawing, Rolling and Forging. Slip line theory, Introduction, Basic equations for incompressible two dimensional flow, continuity equations, Stresses in conditions of plain strain convention for slip-lines, Geometry of slip lines, Properties of slip lines.

> *Engineering Plasticity - Theory and Application to Metal Forming Process -R.A.C..Slater, McMillan Press*
>
> *Johnson and Mellor-Plasticity for Mechanical Engineers*
>
> *Sluzalec, Andrzej -Theory of Metal Forming Plasticity, Springer*
>
> *Chakraborty -Theory of plasticity, Mc Graw Hill.*

ME 814 MODERN CONTROL ENGINEERING (3-0-0) 3

State Variable Analysis of Dynamic systems, State Equations, SISO and MIMO Systems. State Model of Physical Systems: Signal flow graphs, Relation between Transfer function and State equation. Time Response: State Transition Matrix, Time response. State variable Feedback: Stability, Controllability and Observability of system. Digital Control Systems: Overview of Z transforms, Stability Analysis in z-plane, Performance Calculation, Root locus, Response Characteristics. State Space model: Discrete equations, State model, Performance computation, Stability analysis. Nonlinear Control Systems: Nonlinear System Behaviors. Continuous and Discontinuous Nonlinearities: Saturation, Dead zone, Absolute Value Detector, Ideal and Practical Relays, Quantization, Hyterisis, Backlash and Friction. Linearization: SISO and MIMO (State Space) Linearised model. Describing Functions-Principle and Methods. Phase Plane Analysis: Principle and Methods. Stability: Lyapunov Direct method, Lyapunov Functions and Applications.

> *K. Ogata, Modern Control Engineering, Prentice Hall International, NJ.2004*
>
> *Gene Franklin et.al., Feedback Control of Dynamical Systems, Pearson , 1998*
>
> *Phillips, Feedback Control Systems, Prentice Hall International, NJ.2000*
>
> *R C Dorf and R H Bishop, Modern Control Systems, Prentice Hall International, NJ.2001*
>
> *Burns R.S., Advanced Control Engineering, Butterworth Heinemann, 2001.*

ME 815 FRACTURE MECHANICS (3-0-0) 3

History of failure by Fracture; failure of structures, bridges, pressure vessels and ships, brittle fracture, development of testing for failure, identification of reasons for failure, existence of crack, Griffith crack and experiment, energy release rate and stress for failure in presence of crack. Stress Field around Crack Tip; revision of theory of elasticity, conformal mapping, Airy's stress function for crack tip stress field with crack emanating from straight boundary, stress state in crack tip vicinity, modes of crack face deformation, stress intensity factor and Irwin's failure criterion, fracture toughness. Determination of Stress Intensity Factor, different specimen configuration, numerical techniques- boundary collocation and boundary integral, finite element method, experimental method- reflection and refraction polariscopy, Determination of fracture toughness. Energy Consideration; potential energy, surface energy, plastic deformation around crack tip, energy release rate, compliance and correlation with fracture toughness, crack opening displacement (COD), COD as fracture criterion, experimental determination of COD, use of fracture toughness and COD as design criteria. Crack Propagation; law of fatigue crack propagation, life calculation when a crack is present and loaded, microscopic aspects of crack propagation, elastic crack and plastic relaxation at crack tip.

8

Fracture Mechanics Fundamentals and Applications by TL Anderson; CRC Press.
David and Bruck -Elementary Engineering Fracture Mechanics; Norelco.
ST Rolfe and JM Barson -Fracture and Fatigue Control in Structure; Prentice Hall.
AS Tetelman and AJ McEvily, Fracture of Structural Materials ; John Wiley and sons.

ME 816 RAPID MANUFACTURING TECHNOLOGY (3-0-0) 3

Introduction: Need for the compression in product development, history of RP systems, Survey of applications, Growth of RP industry, and classification of RP systems. Stereo Lithography Systems: Principle, Process parameter, Process details, Data preparation, data files and machine details, Application. Selective Laser Sintering: Type of machine, Principle of operation, process parameters, Data preparation for SLS, Applications. Fusion Deposition Modelling: Principle, Process parameter, Path generation, Applications. Solid Ground Curing: Principle of operation, Machine details, Applications. Laminated Object Manufacturing: Principle, of operation, LOM materials. Process details, application. Concepts Modelers: Principle, Thermal jet printer, Sander's model market, 3-D printer. Genisys Xs printer HP system 5, object Quadra systems. Laser Engineering Net Shaping (LENS). RAPID TOOLING: Indirect Rapid tooling -Silicone rubber tooling —Aluminum filled epoxy tooling Spray metal tooling, Cast kirksite, 3Q keltool, etc >Direct Rapid Tooling Direct. AIM, Quick cast process, Copper polyamide, Rapid Tool, DMILS, Prometal, Sand casting tooling, Laminate tooling soft Tooling vs. hard tooling. Software for RP: STL files, Overview of Solid view, magic's, IMICS, magic communicator, etc. Internet based software, Collaboration tools. Rapid Manufacturing Process Optimization: factors influencing accuracy. Data preparation errors, Part building errors, Error in finishing, influence of build orientation. Allied Processes: vacuum casting, surface digitizing, surface generation from point cloud, surface modification-data transfer to solid models.

Paul F. Jacobs: "Stereo lithography and other RP & M Technologies", SME, NY 1996.
Terry Wohlers "Wohler's Report 2000" Wohler's Association 2000.
Gurumurthi -Rapid prototyping materials, IISc Bangalore.
Lament wood -Rapid automated, Indus press, New York
Flham D.T & Dinjoy S.S "Rapid Manufacturing" Verlog London 2001.

ME 817 PRODUCT DESIGN AND RAPID PROTOTYPING (3-0-0) 3

Engineering Materials, metals and their Properties, uses, processing methods, design data and applications, selection criteria, manufacturing and processing limitations, comparative studies; plastics and composites, types, classification, properties, processing techniques and limitation, selection of plastics for specific applications, finishing and surface coating for different materials. Bio-compatibility, Ergonomics, Recycling, etc. ; An overview of three stages of product design, generating and evaluating conceptual alternatives from manufacturability point of view, selection of materials and processes, Evaluating part configurations for manufacturability, Evaluating parametric designs for manufacturability. ; Design for manufacture, influence of materials, process and tooling on the design of components manufactured by metal casting, forming and joining, form design of components, recent developments in casting, machining, forming and finishing, processing of polymers and ceramics, surface modification of materials. Product design for manual assembly, product design for high-speed automatic assembly and product design for robot assembly. Case studies on product design for manufacturing and assembly.

Harry Peck, "Design for Manufacture", Pitman Publications, 1983.
Dieter -"Machine Design", McGraw Hill Publications.
R. K.Jain -"Metrology", Khanna Publications.
Geoffrey Boothroyd, Peter Dewhurst, Winston Knight, Product Design for Manufacture and Assembly, Mercel Dekker Inc. New York.

ME 818 HUMAN FACTORS IN DESIGN (3-0-0) 3

To develop awareness, acquire information, and experience human factors in design. Data logging, data collection, data reduction and data analysis techniques. Gross human anatomy, anthropometry, biomechanics, muscle strength and exertion potential of different limbs, work capacity, environmental effects. Exercises for evaluation of postural forms and work spaces. Environmental conditions including temperature, illumination, noise and vibration. Perception and information processing, design of displays, hand controls, typography and readability, layout and composition. Exercises in evaluation of human response to product interface. Product safety and products liability.

Sanders, M.S. & McCormick, E.J, Human factors in engineering and design, McGraw Hill,1992
Norman, D. The Design of Everyday Things, Basic Books, 2002.
Christopher D. Wickens, John D. Lee, Yili Liu, and Sallie Gordon-Becker, Introduction to Human Factors Engineering, Prentice Hall; 2 edition,2003
Kroemer, K.H.E., Grandjean, E, Fitting the task to the human. London: Taylor and Francis.1997
Sandom, C, Human factors for engineers. London: Institution of Electrical Engineers, 2004.

ME 890: SEMINAR

Each student shall prepare a paper on any topic of interest in the field of specialization – Manufacturing Technology. He/she shall get the paper approved by the Programme Coordinator/Faculty Advisor/Faculty Members in the concerned area of specialization and present it in the class in the presence of Faculty in-charge of seminar class. Every student shall participate in the seminar. Grade will be awarded on the basis of the student's paper, presentation (oral and written) and his/her participation in the seminar

ME899A & ME 899B: MAJOR PROJECTS I AND II

The project work starts in the third semester and extends to the end of the fourth semester. The student will be encouraged to fix the area of work and conduct the literature review during the second semester itself. The topic shall be research and development oriented. The project can be carried out at the institute or in an industry/research organization. Students desirous of carrying out project in industry or other organization have to fulfill the requirements as specified in the "Ordinances and Regulations for M. Tech. under the section - Project Work in Industry or Other Organization."

At the end of the third semester, the students' thesis work shall be assessed by a committee and graded as specified in the "Ordinances and Regulations for M. Tech.". If the work has been graded as unsatisfactory, the committee may recommend a suitable period by which the project will have to be extended beyond the fourth semester.

At the end of the fourth semester, the student shall present his/her thesis work before an evaluation committee, which will evaluate the work and decide whether the student may be allowed to submit the thesis or whether he/she needs to carry out additional work.

The final viva-voce examination will be conducted as per the "Ordinances and Regulations for M. Tech."

Department of Mechanical Engineering, NITK Surathkal, Mangalore 575 025

Financial Model
to a New Postgraduate Programme in Design & Precision Engineering

A new Postgraduate Programme in Design & Precision Engineering is proposed by the Department of Mechanical Engineering in collaboration with CMTI Bangalore in the academic year 2012-13. NITK Surathkal and CMTI Bangalore entered into a MoU for the utilization of expertise of faculty and scientists along with other infrastructure facilities available in these institutions with support of Ministries of Human Resource Development and Industry Promotion. The academic work load will be shared by the faculty in the department and scientist of CMTI as an adjunct faculty members in the first two semesters, following the project/ thesis work at CMTI Bangalore in the third and fourth semester. This joint programme utilizes the specialized precision Engineering facilities at CMTI for academic purposes. The following is the financial model to start this proposed New Postgraduate Programme in Design & Precision Engineering:-

Financial Commitment:

Particulars	Receipts	Expenditure
Intake (No of students) to the proposed programme: 14 + 1 (Sponsored) Approximate fee receipts from 15 students	Rs.9.00 lakhs	
No of adjunct faculty required: 2 Honorarium: Rs.50,000/course and travel expenses for two/three travels in a semester Approx. Rs. 20,000/trip Total expenses on Adjunct faculty per annum		Rs.4.5 Lakhs
Operating fund /annum		Rs.2.00 lakhs
Initial expenses for modernizing the Laboratories Rs.10 lakhs/ year (for the first two years)		

Dr. G C Mohan Kumar
Professor & Head
Dept. of Mechanical Engineering
National Institute of Technology Karnataka, Surathkal
Srinivasnagar - 575 025, Mangalore (INDIA)

21/10/X1

Dean (Acad.). / Registrar

Received on 10/11

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL
INTER-OFFICE COMMUNICATION (IOC)

IOC No: 14/HSM/NITK/2011/824	Date: 21-10-2011

Priority – Level	Initiator's Expectation		
1) Urgent √ 2) *Normal*	1) Approval 4) Suggestion sought	2) Decision 5) Information sought	3) Action √ 6) *Information conveyed*

From (*Initiator*)	Routed-Thru	To (*Respondent*)	Copies to
The HOD Dept. of HSM NITK, Surathkal	-	**The Deputy Registrar (Academic)** NITK, Surathkal	**The Dean (Academic)** NITK, Surathkal

Subject: DRPC Resolution.

Note from the Initiator:

With reference to the subject cited above I am enclosing herewith the DRPC Resolution for your kind information and perusal. The same may be forwarded to the BOS to be convened on 31st October 2011.
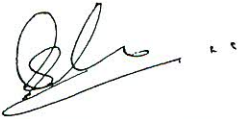
Thank you,

Yours truly,

(Dr. Shashikantha K.)

The Head
Dept. of Humanities, Social Sciences
and Management (HSM)
National Institute of Technology Karnataka
Surathkal, P.O. Srinivasnagar
Mangalore - 575 025

DEPARTMENT OF HSM, NITK, SURATHKAL

RESOLUTION OF THE DRPC

The DRPC met at 3 P.M. on 20 October 2011 and it was resolved to recommend to the BOS that the course "Practice and Theory of Literary Research" (HU 802) be renamed as "Research Methodology in Literature". Further, the course outline and prescribed texts are appended herewith.

Members present:

Dr. Shashikantha K.
HOD, Dept. of HSM

Prof. A. H. Sequeira
Chairman

Dr. K. B. Kiran
Secretary

Encl: 1. Course title, outline and prescribed Readings as per the existing curriculum.

2. Course title, outline and prescribed Readings as per the proposed curriculum.

Enclosure – 1

HU 801   Comparative Literature   (3-1-0) 4

Definition and Scope of Comparative Literature, Development of the Discipline, Methodology; History and Literary History, Elements of Literary History, Problems of Periodisation; Theory of Genres: Oral, Written, Ancient, Medieval and Modern; Comparative Indian Literature: Traditions, Movements, Themes and Genres; Literary Theory: Sanskrit, Tamil/Kannada Poetics, Western Literary Theories; Cross-Cultural Literary Relations: Influence, Analogy and Reception; Translation Studies: History of Translation – Indian and Non-Indian Theories of Translation, Linguistic and Cultural Problems of Translation; Literature and Other Arts; Literature and Cultural Studies

Sisir Kumar Das and Amiya Dev. Comparative Literature: Theory and Practice, Allied Publishers, 1989
Sheldon Pollock. Literary Cultures in History: Reconstructions from South Asia, University of California Press, 2003
Aijaz Ahmad. In Theory: Classes, Nations, Literatures. OUP, 1992.
Krishna, Daya (ed.) India's Intellectual Traditions: Attempts at Conceptual Reconstructions. ICPR & Motilal Banarsidass. 1987.
Tejaswini Niranjana, P. Sudhir and V. Dhareshwar (eds.) Interrogating Modernity: Culture and Colonialism in India Seagull. 1993.
M. Rader. (ed.) A Modern Book of Esthetics, Harcourt, 1979
Alan Singer, et al. (eds.) Literary Aesthetics. Blackwell, 1999
V.S. Seturaman, (ed.) Indian Aesthetics: an introduction. Macmillan, 1992.
Byran S. Turner, (ed) Theories of Modernity and Post-modernity. Sage, 1990.
Patricia Waugh (ed) Postmodernism: A Reader. Edward Arnold, 1992.
Peter V. Zima, The Philosophy of Modern Literary Theory. The Athlone Press, 1999

HU 802   Practice and Theory of Literary Research   (3-1-0)4

Types of Literary Research: Theoretical Research, Textual Research, Historical Research, Interpretative Research, Interdisciplinary Research. Methods of Literary Research: Presentation, References, Footnotes, Indexing, Bibliography.

R. Altick, The Art of Literary Research, Norton & Co., N.Y.
C. Saunders, An Introduction to Research in English Literary History, Macmillan, N.Y.
G. Watson, (Ed.), The Concise Cambridge Bibliography of English Literature, CUP, Cambridge
F.W. Bateson, The Scholar-Critic: An Introduction to Literary Research, Routledge and Kegan Paul, London
J. Anderson, B.H. Durston, and M. Poole, Thesis and Assignment Writing, Wiley Eastern Limited, New Delhi
J. Gibaldi, MLA Handbook for Writers of Research Papers, MLA, N.Y.
E. Burns & T. Burns (Eds.), Sociology of Literature and Drama, Penguin, Harmondsworth
R. Schechner, Essays on Performance Theory: 1970-1976. Drama Book Specialists, N.Y.

HU 803   Literary Theory   (3-1-0)4

The nature of literary evaluation and critical discussion. The place of universal criteria in literary criticism. Is literary experience autonomous? The relation between literary value and (a) social reality: the problem of Commitment, Black literature, Dalit literature, etc., (b) psychological reality, the problem of the unconscious (Freudian and Jungian).The theory of the forms/genres of literature. Structuralism and stylistics.

R. Wellek, and A. Warren, Theory of Literature, Penguin, Harmondsworth
W. Wimsatt and C. Brooks, Literary Criticism: A Short History, OUP & IBH, New Delhi
T. Engleton, Literary Theory: An Introduction, Oxford, Blackwell
K. Elam, Semiotics of Theatre & Drama. Methuen, N.Y.
T.S. Eliot, The Use of Poetry and the Use of Criticism, Faber, London
D. Lodge, (Ed.), Twentieth-Century Literary Criticism, Longman, London
D. Lodge (ed.), Modern Criticism & Theory. Longman, London
I.A. Richards, Principles of Literary Criticism, Routledge & Kegan Paul, London
M. Rader, (Ed.), A Modern Book of Aesthetics, Fourth Edition, Holt, Reinhart & Winston, New York
D. Craig, (Ed.), Marxists on Literature, An Anthology, Penguin, Harmondsworth
N. Frye, Anatomy of Criticism, Princeton University Press, N.Y.

HU 802   **Practice and Theory of Literary Research**   (3-1-0)4

Types of Literary Research: Theoretical Research, Textual Research, Historical Research, Interpretative Research, Interdisciplinary Research, Differences between Method and Methodology in Literature, Methods of Literary Research: Presentation, References, Footnotes, Indexing, Bibliography.

Gabriele Griffin, (ed), Research Methods for English Studies, Edinburgh University Press.
C. Saunders, An Introduction to Research in English Literary History, Macmillan, N.Y.
F.W. Bateson, The Scholar-Critic: An Introduction to Literary Research, Routledge and Kegan Paul, London
J. Gibaldi, MLA Handbook for Writers of Research Papers, MLA, N.Y.
E. Burns & T. Burns (Eds.), Sociology of Literature and Drama, Penguin, Harmondsworth

From

Dr. Shrikantha S Rao

Associate Professor

Dept. of Mech. Engg., NITK.

To

Dean(Academic)

NITK.

Through

Forwarded. To The Deans (Acad) Mhanl 14/9/2011

Head of the Department

Mechanical Engineering, NITK.

Dear Sir,

SUB: Request for Additional Research Guide

I am currently guiding one Reesearch Scholar, Mr.Goutham D.Revankar (ME09P11) on Part Time basis and his research proposal is yet to be presented. As the proposed research work requires process modeling and detailed analysis of Titanium alloy machining, I request you to kindly approve the inclusion of Dr.Raviraj Shetty, Associate Professor of MIT,Manipal as Additional Guide.

The necessary documents in this regard are attached herewith.

Yours sincerely,

Shrikantha
(10/9/2011)

Forwarded)
DRPC meeting was held on 14-9-2011 at 3·30 pm. Above matter was discussed and DRPC recommended the additional guide as Dr. Raviraj shetty, MIT Manipal. The format is enclosed for kind consideration
14/9/2011

Dr. G C Mohan Kumar
Professor & Head
Dept. of Mechanical Engineering
National Institute of Technology Karnataka, Surathkal
Srinivasnagar - 575 025, Mangalore (INDIA)

Request for Recognition as Research Guide for Ph.D. Program

[Proposed Research guide (internal/external) with PhD → DRPC → Dean-A]

[To be filled-in by the proposed Research Guide]

Name: Dr. Raviraj Shetty   Designation: Associate Professor

Department: Aeronautical & Automobile   Date of joining: 28-10-2002

Name of University from where Ph.D. is obtained: Manipal university

Month & Year of obtaining Ph.D.   2009 January 27th

Title of Doctoral Thesis: Modelling, Analysis and Experimental investigation on Machining of Discontinously Reinforced Aluminium Composites.

Raj Shetty

Signature with Date: 02-06-2011

[Recommendation by the DRPC]

Date of DRPC meeting: 14-9-2011

In the case of external research guide, the name & Reg. No. of the student for whom the research guide is proposed : Goutam. D. Revankar - ME09P11

Nagaraja - 102020 ME10F12 → 25 Senate - C1

Decision of DRPC: *The request for recognition as research guide is acceptable / not-acceptable* 18 BOS-22

(if not acceptable, specific reasons must be furnished separately) Additional Guide not approved for full time student

Names & Signatures of DRPC members:

(1) DR. H. Suresh Hebbar   (2) G. N.

(3) Dr S M. Munjenebayo   (4)

(5) DR Narendranath-S   (6) Ashok Babu

80
25.10.2011

[Forwarding by the DRPC]

The request for recognition as research guide, along with the DRPC recommendations, is being forwarded to the Dean (A).

Secretary-DRPC 13.9.11   Date 3.9.11   14/9/2011 Chairman-DRPC

[Verification of Records]

The Records were verified and found to be in order.

Supdt. (Academic Section)   DR (Academic)
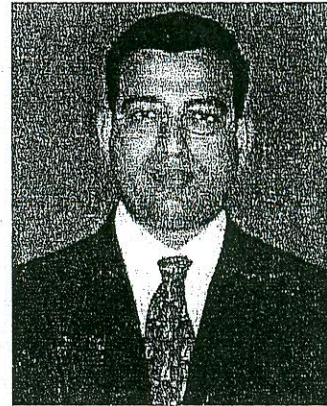
[Approval]

The request for recognition as Research Guide is **approved / not-approved**.

Associate Dean (PG&R)   Dean (Academic)

Note: In the case of external research guide, a brief bio-data with the copy of doctoral certificate is to be attached.

CURRICULUM VITAE

RAVIRAJ SHETTY

CAREER OBJECTIVE

To work sincerely, building a symbolic relationship with your organization where my effort will be complemented by career growth, higher degree of responsibility and to prove myself as a valuable asset.

QUALIFICATIONS

Ph. D. (Composite Materials- January 2009) *[Manipal University]*

M. Tech.(Advanced Manufacturing Engineering-July-2002) – **First Class with Distinction** *[Mangalore University]*

M.B.A.(Human Resource Management-July-2009) – **First Class with Distinction** *[Sikkim Manipal University]*

B.E. (Industrial and Production-July-1999) – **First Class** *[Mangalore University]*

CORE COMPETENCE

-   Composite Materials
-   Non Traditional Machining
-   Advanced Machining Techniques
-   Human Resource Development.
-   Cutting Tool Design and Manufacturing
-   Robotics and Mechatronics
-   Industrial Automation
-   Tribology

PERSONAL DETAILS

Father's Name: Ramanath Shetty

Phone (office): 0091-820-2571070-110 • Mobile: +91-9845072543 • Fax: 0091-820-2571071   1 of 8
rrshetty2@rediffmail.com , rrshetty@lycos.com

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Date of Birth: 23rd June, 1974.

Passport Number: **A881667**

Local Address: Flat-101,Vibha Mansion, Vidyarathnanagar Manipal, 576104,INDIA

EXPERIENCE (10 Years - Teaching + Administrative + Research)

28th October, 2002 to date: Manipal Institute of Technology, Manipal 576 104.
Duties:

- General Administration
- In charge Head of the Department
- Preparing the developmental/expansion plans of the institute and forwarding it to the University
- Preparing the proposals for introducing new degree and certificate programs
- Liaison with Local authorities
- Examination related issues such as scheduling, question papers procurement and distribution, handling queries on grades and mark sheet correction.
- Overseeing the senate submission documents with specific reference to curriculum, program structure, program details, eligibility criterion etc.
- Managing the overall activities of the research.
- Setting a composite manufacturing research laboratory
- Guiding the Ph.D. research projects
- Guiding M.Tech. (Advanced Manufacturing Engineering, CAMDA) projects at MIT, Manipal.
- Guiding B.E (Mechanical, Aeronautical and Manufacturing Engg) project at MIT, Manipal.

3rd January 2010– to the date: Manipal Institute of Technology,
Manipal 576 104, India.
ASSOCIATE PROFESSOR – Aeronautical Engineering

Duties:
P.G. Students (M.Tech.):
- Lecturing on Aerospace Materials, Cryogenics, Industrial Robotics & Theory of Metal Cutting.

Student Research Cell, Chairman :
Duties:
- Managing the overall activities of the research.
- Providing new innovative ideas to Students.
- Publishing research papers.

Block Warden, Manipal Hostel :
Duties:
- Managing the overall activities of the Hostel.
- Providing Career Guidance to Students.

Phone (office): 0091-820-2571070-110 • Mobile: +91-9845072543 • Fax: 0091-820-2571071   2 of 8
rrshetty2@rediffmail.com , rrshetty@lycos.com

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- Providing pre-counselling to the students.
- Providing information about competitive examinations and organizing training programs on CAT and GMAT.

27th Februaury, 2007 – 3rd January2010: Manipal Institute of Technology, Manipal 576 104, India.
ASSISTANT PROFESSOR - Mechanical & Manufacturing Engineering

Duties:
P.G. Students (M.Tech.):
- Lecturing on Composite Materials, Industrial Robotics & Theory of Metal Cutting.

Post Graduate Theses Guided (2000-2009)
    M.Tech. (Advanced Manufacturing Engineering and CAMDA)

1. Analysis and simulation of stress distribution in machining of Discontinuously Reinforced Aluminum Composites(DRACs)
2. Mathematical model to estimate the Tool Wear & Surface Roughness during turning of 6061 Al-SiC Metal Matrix Composite.
3. Application of Finite Element Analysis and Design of Experiments on Machinability of Elastomers.

U.G. Students (B.E.):
- Lecturing on Foundry and welding Technology, Production Techniques and Tool Engineering.
- Guided more than 50 under Graduate research projects.

28th October, 2002 – 27th February, 2007: Manipal Institute of Technology, Manipal 576 104, India.
LECTURER - Mechanical & Manufacturing Engineering
Duties:
- Lecturing in Mechanical Engineering
- Publishing technical papers
- Organizing technical seminars
- Participating in the activities of Society for Technical Education.
- Setting papers and evaluating answer scripts.

1st August, 1999 – 5th October, 2002: National Institute of Tech., Surathkal, India.

ASSISTANT LECTURER - Mechanical Engineering

- Nature of duty is same as above

Phone (office): 0091-820-2571070-110 • Mobile: +91-9845072543 • Fax: 0091-820-2571071   3 of 8
rrshetty2@rediffmail.com , rrshetty@lycos.com

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PUBLICATIONS

International Journals

1. Tribological studies on discontinuously reinforced aluminium composites based on the orthogonal arrays, *ARPN Journal of Engineering and Applied Sciences,* Vol.3,no.1, **2008**, pp.94-92, **ISSN 1819-6608**

2. Study of Surface roughness minimization in turning of DRACs using Response surface methodology and Taguchi under pressured steam jet approach, *ARPN Journal of Engineering and Applied Sciences,* Vol.3, no.1, **2008**, pp.59-67, **ISSN 1819-6608**

3. A pressured steam jet approach to tool wear minimization in cutting of metal matrix composites ,*Materials Science Forum*, Vol. 561-565, **2007**, pp.643-646, **ISSN 0255-5476**

4. Steam as coolant and lubricant in turning of Metal Matrix Composites, *Journal of Zhejiang University Science*, Vol.9(09), **2008**, pp.1245-1250, **ISSN1673-565X** (Print); **ISSN 1862-1775** (Online)

5. Finite element modeling of stress distribution in the cutting path in machining of discontinuously reinforced aluminium composites, *ARPN Journal of Engineering and Applied Sciences*, Vol.3, no.4, **2008**, pp.25-31, **ISSN 1819-6608**

6. Machinability study on DRACs using Response Surface Methodology and Taguchi's Design of Experiments under dry cutting condition, *Maejo International Journal of Science and Technology*, Vol. 2(01), **2008**, pp.227-239, **ISSN 1905-7873**

7. Experimental studies on turning of discontinuously reinforced aluminium composites under dry, oil water emulsion and steam lubricated conditions using TAGUCHI's technique, *Gazi University Journal of Science*, Vol.21, no.2, **2009**, pp.33-36, **ISSN 1303-9709**

8. Experimental and Analytical study on chip formation mechanism in machining of DRACs, *ARPN Journal of Engineering and Applied Sciences*, Vol.3, no.5, **2008**, pp.27-32, **ISSN 1819-6608**

9. Taguchi's Technique in Machining of Metal Matrix Composites, *Journal of Brazilian Society of Mechanical Sciences*, Vol.XXXI, no.1, January-March **2009**, pp.12-20, **ISSN 0100-7386**

Phone (office): 0091-820-2571070-110 • Mobile: +91-9845072543 • Fax: 0091-820-2571071 4 of 8
rrshetty2@rediffmail.com , rrshetty@lycos.com

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10. Application of Response Surface Methodology on Surface Roughness in Grinding of Aerospace Materials (6061Al-15vol%SiC$_{25p}$), *ARPN Journal of Engineering and Applied Sciences*, Vol.5, no.6, **2010**, pp.23-28, **ISSN 1819-6608**

11. Application of Statistical Tool for Optimisation of Specific Cutting Energy and Surface Roughness on Surface Grinding of Al-SiC$_{35p}$ Composites, *International Journal of Science and statistical computing*, Vol.1, no.2, **2011**

12. Response surface model for optimisation of metal removal rate and surface roughness in grinding of DRACs, *Maejo International Journal of Science and Technology(Accepted)*

International Conferences

13. Study of tool wear in turning 15% SiCp reinforced 6061 aluminium metal matrix composite with steam as coolant, in; Proceedings of International conference on Advanced Material processing and characterization, *APMC- 2006*, Chennai, India

14. Tribological studies on PCBN tool in turning metal matrix composites with Steam as coolant , in; Proceedings of International Tribological Conference, *AUSTRIB-2006*, Brisbane, Australia.

15. Application of Finite-element analysis in orthogonal cutting of aluminium metal matrix composites, in; Proceedings of International conference on Advances in Mechanical Engineering, *ICAME-06*, Chennai, India.

16. Chip and built-up edge formation in turning age hardened AA6061/15 vol. % SiCp composites with steam as coolant , in; Proceedings of Second International Conference on Recent Advances in Composite Materials, *ICRAM- 2007*,Newdelhi,India.

17. Steam as environment friendly lubricant in metal cutting process, in; Proceedings of 15th Symposium on Lubricants, Additives, Waxes and Petroleum Specialty Products, *LAWPSP-2007*, Mumbai, India.

- 43-

18. Tribological studies of steam penetration in different directions in turning of metal matrix composites using steam as coolant, in; Proceedings of International Conference on Industrial Tribology, *ICIT-2006*, Bangalore, India. (CD-ROM)

19. Influence of lubrication condition on surface roughness in turning of metal matrix composites, in; Proceedings of Sixth International Conference on composite science and technology *ICCST/6* , Durban, South Africa (CD-ROM)

20. A pressured steam jet approach to tool wear minimization in cutting of metal matrix composites, in; Proceedings of International Conference in Composite Science and Technology, *PRICM-2007*,South Korea. (CD-ROM)

21. Experimental studies on planar robot used for cutting glass using hot air by crack propagation method, in; Proceedings of International Conference in Manufacturing and Automation, *ICMA-2007*, National University of Singapore, Singapore (CD-ROM)

22. The statistical modelling of surface roughness in face milling of Hot work Chromium Steel (AISI H11), International Conference on Fascinating Advancement in Mechanical Engineering, *FAME-2008*,Tamilnadu(CD-ROM)

23. Surface roughness minimization for cutting glass using hot air by crack propagation method by means of numerical methods, International Conference on Science, Technology and Innovation for Sustainable Well-Being, *STISWB-2009*, Mahasarakham University, Thailand (CD-ROM)

National Conferences

24. Finite-element analysis of chip-separation criterion with different rake angles in orthogonal cutting of aluminium metal matrix composites, in; Proceedings of National conference on Recent Trends in Mechanical Engineering, *NCRTME-2006*,Mysore, India.

Phone (office): 0091-820-2571070-110 • Mobile: +91-9845072543 • Fax: 0091-820-2571071   6 of 8
rrshetty2@rediffmail.com , rrshetty@lycos.com

- 44 -

WORKSHOP ATTENDED

1. Participated in one week short term training programme (STTP) Titled Noise-measurement, analysis and control sponsored by the AICTE AND ISTE, New Delhi conducted by the Department of Mechanical Engineering from March 8-13th, 2004 at SJC, Mysore, India.

2. Participated in two day Seminar/Workshop on "Micro-Electro Mechanical Systems" [MEMSWS] sponsored under TEQIP conducted by the Department of Mechanical Engineering from August 1-2nd, 2005 at NITK, Surathkal, India.

3. Participated in one week short term training programme (STTP) on "Faculty development programme" sponsored by the AICTE, New Delhi conducted by the Department of Continuing Education, 2003-2004 , MIT, Manipal, India.

4. Undergone an in-house Basic Training Program on "CATIA V5 R7" conducted by the Department of Mechanical Engineering from 15-18th January 2003, MIT, Manipal, India.

5. Participated in Five Day Workshop on "Rotor Dynamics", conducted by the Department of Mechanical Engineering from 6 to10th, December, 2004, MIT, Manipal, India.

6. Participated in Three Day Workshop on "Advanced Condition Monitoring", conducted by the Department of Mechanical Engineering from 11 to 13th, August, 2005, MIT, Manipal, India.

CONFERENCE ORGANIZED

1. National Conference in Recent Trends in Lubrication Engineering , 2005, Manipal Institute of Technology Manipal.

2. National Conference on the Developments and Challenges in Manufacturing, NCDCM, 2004, Manipal Institute of Technology Manipal.

REVIEWERSHIP

1. **Reviewer** for Proceedings of the Institution of Mechanical Engineers, Part J, Journal of Engineering Tribology, ISSN: 1350-6501,

APPROVED DOCTORAL RESEARCH GUIDESHIP

Phone (office): 0091-820-2571070-110 • Mobile: +91-9845072543 • Fax: 0091-820-2571071   7 of 8
rrshetty2@rediffmail.com , rrshetty@lycos.com

- 45-

University - Manipal Academy of Higher Education, Manipal.

Research areas: Composite Materials, Finite Element Methods, Design of Experiments, Management, Advanced Machining Techniques,Tribology

PROFESSIONAL MEMBERSHIPS

1. Indian society for technical education-*M.ISTE*
2. Tribology Society of India-*M.TSI*
3. Institute of Engineers-*M.IE*

SOFTWARE EXPOSURE

1. Modeling; CATIA, MDT, INVENTOR, PRO-E ,UNI GRAPHICS, Auto CAD
2. Analysis; ANSYS Ls/dyna , NASTRAN, FLUENT, FLOTRAN ,MSC ADAMS.
3. Preprocessor ; PATRAN, GAMBIT, HYPERMESH.
4. Programming; Visual C++, MATLAB, EXCEL
5. Statistical Tool; MINITAB-15

EXPERIENCE IN MECHANICAL TESTING

- Tensile Testing on Hounsfield Tensometer.
- Hardness Testing (Brinell, Vickers, Rockwell)
- Fabrication of Metal Matrix Composite through stir casting Route and Evaluating their Mechanical Properties.
- Wear testing on pin-on-disc test machine.
- Microstructural observation of the materials using JEOL JSM-6380LA Analytical Scanning electron microscope.
- Tool wear measurements using Vision Plus Tool makers microscope METZ -1395
- Surface roughness measurement using Taylor/Hobson surtronoic 3+ surface Roughness measuring instrument.

SUBJECTS TAUGHT

B. E. Mechanical ,Aeronautical, Manufacturing and Automobile Engineering:

Engineering Graphics, Composite materials, Advanced manufacturing Technology, Production Techniques, Foundry and Welding Technology, Tool Engineering, Industrial Robotics, Finite Element Methods

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rrshetty2@rediffmail.com , rrshetty@lycos.com

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M. Tech. Advanced Manufacturing Engineering, CAMDA and Control Systems:

Advanced Composite Materials, Tool Design, Robotics and Automation, Industrial Robotics

Special Lectures:

Taguchi's Design of Experiments, Response Surface Methodology, Robotics

REFERENCES

- **Prof. Dr. Rammohan Pai**, Head of the Department, Dept of Aeronautical and Automobile Engineering, Manipal Institute of Technology, Manipal, Tel (Work), +91-9448107622, rammohan.pai@manipal.edu
- **Prof. Dr. Shrikanth Rao**, Dept of Mechanical Engineering, National Institute of Technology, Surathkal, Tel (Work), +91-9741967833, ssrcsr@gmail.com
- **Prof. Dr. Raghuvir Pai**, Chair Person, Manipal University, Dubai Campus, Dubai Manipal, Tel (Work), 0097556967662, rbpai@yahoo.com

PERSONALITY TRAITS

➢ Commitment to work

➢ Adaptability

➢ Goal Oriented Person

➢ Problem-Solving Abilities

➢ Comfortable with Team-Work

I hereby declare that all the above information is true to the best of my knowledge.

Raviraj Shetty

[Raviraj Shetty]

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Manipal University

Formerly known as Manipal Academy of Higher Education

This is to certify that

DR. RAVIRAJ SHETTY

has been admitted to the

Degree of

Doctor of Philosophy (Ph.D.)

in recognition of his/her research work entitled

Modeling, *Analysis and Experimental Investigation*

on Machining of Discontinuously Reinforced

Aluminium Composites

and he/she having fulfilled the prescribed requirements

on 27-Jan-2009

R·P· WARMER

Vice-Chancellor

ON THIS DATE: *February 03, 2009*

Reg. No. *050900062*

27270
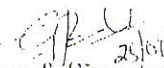
Department of Mechanical Engineering
National Institute of Technology Karnataka, Surathkal
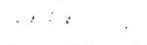
Information sheet for Research Scholars
(to be submitted at the time registration to the Secretary DRPC)

Name of the Programme of study : PhD

Category (Full Time / Part Time) : Part Time

Name in block letters : GOUTAM DEVARAYA REVANAKAR

Address for Communication : Vimaleshwara Nagar Udaynagar
Hubli Road DHARWAD

E-mail ID: goutamrabh...@yahoo.co.in Phone Number: Land Line: 0836 2 236443
Mobile : 9448165312

Date of Admission to NITK : Jan 07, 2010

Registration Number/Admission Number : ME09 P11

Date of Registration to the current Semester : 25 July 2011

Details of Fee Paid (Receipt No.)with date : 25 July, 2011

Title of Thesis/Area of Research : Modelling Analysis & Experimentation of Machining of Ti-6Al-4V

Name of the Supervisor(s) : Dr. Shrikanth Rao.

RPAC Members :

Date of Last Progress Seminar :

No. of Publications (please attach the list as annexure to this form):

(Details of Publications in International ,National journals, International and National Conferences shall be given as Annexure in the order of Name of author(s), Journal Title, Volume, Page No., Year)

Certified that the above information is true to the best of my belief and knowledge.

Name & Signature of Research Scholar
With date

Countersigned by the Supervisor(s)
Signature with date

Forwarded to Secretary, DRPC:

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A proposal for Ph.D. Comprehensive Examination

- a Qualifying examination for Ph.D. Scholars

a) Every Ph.D. scholar shall take and perform satisfactorily in a Comprehensive Examination in his/her Department. The Comprehensive Examination shall be conducted by a Comprehensive Examination Committee of the Department, consisting of the Research Progress Assessment Committee members of the scholar and at least four other faculty members of the Institute nominated by the Dean Academic.

b) If the performance of a research scholar in the Comprehensive Examination in the first attempt is not satisfactory, he/she will be given one more opportunity to appear for the comprehensive examination within six months of the first attempt. The registration of a research scholar who fails to complete successfully the Comprehensive Examination in both attempts, his/her registration will be cancelled.

c) The objective of the Comprehensive Examination is to test the general capability of the research scholar and the breadth of his/her knowledge in his/her discipline and areas related to his/her field of research. The Comprehensive Examination will usually consist of a written test and oral examination.

d) The Comprehensive Examination Committee shall intimate to the research scholar sufficiently in advance the scope of the Comprehensive Examination, so as to enable the scholar to prepare adequately for it.

e) The Ph.D. research scholars are normally expected to complete successfully the Comprehensive Examination within a year after his/her registration in the Ph.D programme and in any case not later than three semesters after his registration in the Ph.D. programme.

Committee for the Comprehensive Examination for oral examination:

The Head of the Department will intimate to the Dean, Academic, a panel of faculty members for the constitution of a Committee; (Four within the department and four within the division). The Dean academic will indicate two examiners each within the department and within the division. This committee is common to all the Ph.D. scholars in the academic year.

Committee for oral examination:

Head of the Department/ (his nominee)	: Chairman
Faculty Members within the Department	: Members
Faculty Members within the Division	: Members
Guide/s and	: Members
RPAC members of the respective Scholar	: Members

25/10/2011

Dr. G C Mohan Kumar
Professor & Head
Dept. of Mechanical Engineering
National Institute of Technology Karnataka, Surathkal
Srinivasnagar - 575 025, Mangalore (INDIA)

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

INTER-OFFICE COMMUNICATION (IOC)

Ioc No.PHY / 2011 /469	Date: 19-10-2011

Priority-level	Initiator's Expectation	
1. **Urgent** 2. Normal	1. **Approval**	2. Decision
	3. Action	3. Information conveyed.
From (Initiator)	Routed through	To (Respondent)
Dr. N.K. Udayashankar HOD, Physics Dept. NITK.	Dy. Registrar (Academic)/Secretary, BOS	The Dean (Academic) NITK

Sub: Agenda item to be included for BOS meeting to be held on 31st October 2011

Ref: NITK/BOS-2011/DR Dated : October11, 2011

Note from the Initiator

Please find herewith the agenda item along with the DPGC resolution for

consideration in BOS meeting to be held on 31st October 2011.

19-10-2011

(N K Udayashankar)

विभागाध्यक्ष / H.O.D

भौतिकी विभाग / Physics Dept.

राष्ट्रीय प्रौद्योगिकी संस्थान कर्नाटक सुरत्कल

NITK SURATHKAL

मंगलूर - 575 025, कर्नाटक

MANGALORE - 575 025, KARNATAKA

For the Respondent's use

The Resolution of the DPGC Meeting held on 19-10-2011 in the Committee Room of Physics Department at 10 AM.

The DPGC meeting was held in the committee room of Physics Department at 10 AM to discuss the necessary changes to be made in the M.Sc Project Courses taken by the students in III and IV semester. At present, the **MSc Project** has the following structure:

PH898 M.Sc. project (3rd Sem)   8 credits

PH898 M.Sc. project (4th Sem)   12 credits

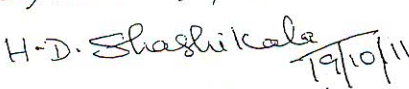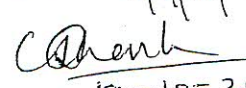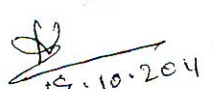(Ref: *NITK-Course Structure (PG&R) 2009 page 29 of 30 including amendment for credits.*)
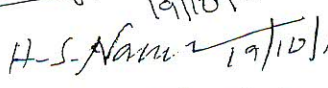
Presently, these two project courses have been assigned the same code number PH898, as shown above. There is a difficulty in awarding grades to the students at the end of 3rd and 4th semester, **for the same course twice**. Therefore, as suggested by Dean(Academic), It has been resolved by DPGC to give the following different course names and code numbers as follows:

PH898 M.Sc. project –I (3rd Sem)   8 credits

PH899 M.Sc. project-II (4th Sem)   12 credits

This may be kindly included as agenda item for discussion in BOS meeting to be held on 31st October 2011 for the necessary approval and further action.

The following members were present:

1) Dr. AJITH K M   19/10/11

2) Dr. H.S. Nagaraja   H.S.Nara 19/10/11

3) Dr. H.D. Shashikala   H.D.Shashikala 19/10/11

4) Dr. N.K. Udayashankar   19-10-2011

5) G. UMESH.   G. Umesh

6) Kasten. V. B.   19.10.2011

DEPT. of COMPUTER SCIENCE & ENGG.
NITK SURATHKAL

Ref.No.319/KCS/2011   Date :17-10- 2011

From: Dr.K.C.SHET

     Professor

To: The Dean (AA)

     NITK Surathkal

        Sub: Proposal to discuss as agenda in BoS.

Dear Sir,

       Several faculty members of our department/ division have expressed their feelings in various meetings. On their behalf, I would like propose following changes in the Curriculum.

1. RPAC report.

The RPAC generally does not send descriptive report. But for effective functioning, it seems necessary, that it should send one para/page descriptive write up on what transacted in the seminar. It can also include recommendations including advise to the candidate who delivered seminar.

2. Constitution of DTAC.:

The presently, The DTAC does not include RPAC. I propose as follows:
The constitution of DTAC may be done as :
   RPAC + Indian Examiner of Thesis + Chairman.

Justification: The role of RPAC does not end soon after submission of Ph.D thesis. The RPAC should own the responsibility of complete progress till defense. Thus this change is brought.

K.C. SHET

1 4 OCT 2011

No.........................

NITK, SURATHKAL

3. Constitution of DRPC.

Presently, it appears that the HOD is the chairman for DUGC, DPGC & DRPC.
In order to have effective functioning of DRPC and decentralizing the work load, the following changes may be brought.

Chairman: Senior most Professor of the dept./Program co-coordinator/Professor as nominated by the Director.

4. Admission to M.Tech program.

It is observed by IITs/IISc/NITs/Deemed universities that the GATE score does not reflect true capability of a student. In spite of that GATE score is taken as a major parameter to admit the students for Postgraduate program in Engg., as it is easy to administer. Thus it appears that we should insist good UG score along with GATE score.

Thus PG curriculum 2009, Page 5 of 10, Section 2.5 may be modified.

Existing: "....... CGPA of at least 5.5.............55% marks in the aggregate..............."

To be modified as

".....CGPA of at least 6.0.............. 60% marks................."

(Of course CGPA 5.5 or 55% marks in case of sc/st students)

Thanking you.

Yours sincerely

K.C.SHET

Copy to: The HOD, CSE