CENTRE FOR CONTINUING EDUCATION
(PROFICIENCE-PR0GRAMME)
INDIAN INSTITUTE OF SCIENCE,
BENGALURU 560012

JANUARY-MAY 2017

COURSE INFORMATION ON REGULAR COURSES

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Sl No	Name of the Course		Credit
1	Advances in EHV / UHV Power Transmission & Distribution	(Mon)	2+0
2	Innovative Product Development and Design Methods	(Mon)	2+0
3	Introduction to Artificial Intelligence and Applications	(Mon & Wed)	3+0
4	Project Management	(Mon & Wed)	3+0
5	Renewable Energy Resources: Principles, Technology and Utilization	(Mon)	2+0
6	1D & 2D NMR Spectroscopy: Applications in Structure Biology	(Tue)	2+0
7	Accounts for Engineers	(Tue & Thu)	3+0
8	Importance of "Intellectual Property Rights"(IPR) for industries and academia	(Tue)	2+0
9	Introduction to the Linux Environment: OS, Command, Utilities and Shell Scripting	(Tue &Thu)	3+0
10	Service Design Thinking	(Tue)	2+0
11	Strategic Management	(Tue & Thu)	3+0
12	Basic Spectroscopy and Instrumentation	(Wed)	2+0
13	Embedded System Design using Microcontrollers	(Wed)	2+0
14	Introduction to Numerical Grid Generation & Fluid Flow Computations	(Wed)	2+0
15	Vibration and Noise Control in Engineering Structures and Systems	(Wed)	2+0
16	Machine Learning of Sensory Signals	(Thu)	2+0
17	Neural Networks for Signal Processing -1	(Thu & Fri)	3+0
18	Power System Automation towards Smart Grid	(Thu & Fri)	3+0
19	Analysis and Design of Composite Structures	(Fri)	2+0
20	Industrial Internet of Things (IIoT)	(Fri)	2+0
21	Structural Analysis and Design Optimization of Engineering Structures and Systems	(Fri)	2+0
22	Advances in Genetic Engineering & Transgenic Technology	(Sat)	2+0
23	Basic Concepts of Finite Element Method	(Sat) 2 pm to 4 pm	2+0
24	Basics of Data Analytics	(Sat)	2+0
25	Basic Level French Language	(Sat) 2 pm to 4 pm	2+0
26	Cell and Molecular Biology of Aging and Diseases	(Sat) 2 pm to 4 pm	2+0
27	Communication Protocols, Design and Multimedia Applications	(Sat) 2 pm to 4 pm	2+0
28	Introduction to Acoustics	(Sat)	2+0
29	Nonlinear Finite Element Method	(Sat)	2+0
30	Performance Modeling and Simulation	(Sat)	3+0
31	Principles and Applications of Biology Techniques In Research	(Sat)	2+0
32	Smart Design Methods and Processes in Automotive Industry	(Sat) 2 pm to 4 pm	2+0
33	Wireless LANS CONCEPTS, Installation, Troubleshooting and Testing	(Sat)	2+C
34	Software Test Automation	(Sat) 2 pm to 4 pm	2+0

INTRODUCTION

Indian Institute of Science (IISc) established in 1909, is a Deemed University and Centrally Funder Technical Institution under the Department of Higher Education, Ministry of Human Resources Development, Government of India.

Rapid strides in science and technology make it imperative that the education of professionals be continued over their entire career rather than be confined to a single stretch. What is needed is a complete integration of education with work during their productive life span, which will be adequate to help them cope with new demands. Continuing Education embraces all the processes of education that one undergoes throughout a working life and which have a relevance to the practical problems likely to be encountered in one's career. It may be realized through formal and informal modes of teaching, or through mass media. In recent years, there has been a growing awareness on the part of Universities that imparting knowledge to people beyond their boundaries is an equally important part of their service to the community. With this broad perspective of their function in society, Universities have begun to seek ways of reaching out to professionals. The IISc has evolved several mechanisms to make the expertise and facilities available to qualified technical people in industries, Universities and research establishments. The need for forging links between academic institutions and industries and R&D organizations has been a goal set for the IISc by its illustrious founder, J.N. Tata.

CCE-PROFICIENCE was established with the objective of providing a sustained and rigorous continuing education program offering courses on subjects of topical interest to scientists and engineers in and around Bangalore. This program, believed to be the first of its kind in the country, is a joint venture between IISc and several Professional Institutions/Societies in Bangalore. The program name signifies the coming together of Professional Institutions and the Indian Institute of Science. It was started on an experimental basis in 1980 and has proved to be extremely popular and has attracted wide attention in academic and professional circles. The demand for some courses, especially on computers, microprocessors and management is so overwhelming that it has not been possible to admit all the Eligible applicants.

Every year, there has been a steady increase in the number of students as well as the types of courses offered indicative of the growing popularity of this Program. IISc is the custodian of the academic standards of all CCE-PROFICIENCE courses. It has the responsibility of evolving appropriate teaching norms, providing the venue and facilities for conducting courses, organizing the tests and examinations and issuing certificates to the successful participants. These tasks are coordinated by the Centre for Continuing Education (CCE).

COURSES

Continuing education program organized under CCE-PROFICIENCE offers semester long courses in areas of topical interest. The courses are organized during evening hours so that working professionals can participate without getting their normal work affected. All courses are normally at the postgraduate level and many of these are in fact offered to the IISc students regularly. Participants in certain selected courses are provided practical training in computer and other laboratories, as appropriate. The course contents are regularly upgraded on the basis of feedback from the faculty and the participants. Courses are offered during the period AUG-DEC and JAN-MAY and around 15-20 courses are scheduled during each semester.

Each course has lectures at the rate of two or three hours per week depending upon the number of course credits. Tests and examinations are conducted according to the IISc norms. A series of courses leading to different specializations are offered in a sequential manner, especially in the area of Computer Science and Engineering. This would enable the participants who start with the entry level courses progress towards more advanced ones and specialize in one of the streams.

EVALUATION

The total marks for assessment will be equally distributed between the seasonal work and end semester examination. The seasonal work consists of class tests, mid semester examination, and homework assignments etc. as determined by the instructor. The participants who maintain a minimum of 75% attendance both in the theory and computer/laboratory classes will be evaluated based on the combined performance in the end semester examination and seasonal work and assigned a letter grade.

NO RE-EXAMINATION SHALL BE CONDUCTED UNDER ANY CIR CUMSTANCES.

The letter grades carry a 10 point Grading assessment as indicated below:

Grade:	A$^+$	A	B$^+$	B	C	D	F(Fail)
Grade Points:	10	9	8	7	6	5	0

CERTIFICATES

Certificates will be issued only to those who get at least a ‘D’ grade. Attendance certificates shall not be issued to anyone. This being a continuing education program meant especially for self-improvement, the credits accumulated cannot be equated with the credits earned through formal education. There shall be no claims for CCE-PROFICIENCE credits being counted towards partial fulfillment of credit requirements towards any degree/diploma or other formal recognitions offered by IISc.

Formal Course completion certificates will not be issued under any circumstances to any candidate.

FACULTY

The instructors for the courses are mostly Institute Faculty. However, competent professionals from other R&D organizations and industries are also involved in teaching some of the courses.

REGULAR COURSES

Computer Lab: A Computer Laboratory with adequate computer machines and a Silicon Graphics work station with a variety of latest software have been set up for the CCE-PROFICIENCE program. All these machines have been locally networked. A good collection of video cassettes pertaining to several courses is also available for viewing at the Centre for the participants.

Library: CCE-PROFICIENCE participants can avail of the facility of IISc Main Library and they can also make use of the books in CCE. The books at both the IISc Main Library and CCE are meant only for reference. The participants can avail of this facility by producing their ID card issued by CCE-PROFICIENCE.

Timings:

IISc Library - 8.00 a.m. - 9.00 p.m.

INSTRUCTIONS

HOW TO APPLY:

Details of the courses are available online at cce.iisc.ernet.in and also download CCE App from Google Playstore. Essential Qualification for any course is a degree in Engineering or a postgraduate degree in Science/Humanities as applicable with pre-requisites. Each participant will be admitted for a <u>Maximum of Two Courses.</u> Applying to courses is strictly through online portal of CCE. Please read all the instructions provided at our portal before applying. Payment of course fee is through payment gateway provided at our online portal and no other means of payment is accepted. The course fee is <u>Rs. 5000/-</u> per credit and registration fee is <u>Rs. 300/-</u> per course. Any other gateway charges must be borne by participant during online payment. For each application, participants must upload (BE, B.Tech / Post Graduation) Convocation/Degree Certificate without fail. (Class conducted: Week days 6 pm. to 8 pm) & (Saturday's 10 am to 1 pm & 2 pm to 4 pm)

FEES

The course fee is Rs. 5000/= per credit. Some of the courses include a limited exposure to computer operation and programming / Lab Fee (C). The additional fees of this are Rs. 5,000/- The course fee and laboratory fee should be paid in full at the time of joining the course.

REFUND OF COURSE FEE

Refund of course fee will not be made, unless the course is withdrawn officially, in which case, the course fee paid will be refunded in full. Application registration fee once paid will **NOT BE REFUNDED** under any circumstance. Refund of fees in case of dropped courses will take minimum 3-4 weeks.

CLASSES

Classes will be held in the Lecture Hall Complex of IISc. Lectures will be between 6.00 p.m. and 8.00 p.m. Monday through Friday and between 10 a.m. to 1 p.m. and 2pm to 4 pm on Saturday's.

LABORATORY CLASSES

The timings and days for laboratory classes will be fixed in the second week of the respective months (August & January) after the complete registration is known. This will be done, keeping in view the convenience of the faculty and all the students of the courses with laboratory component.

RESULTS:

Results of the courses will be announced normally around 1st week of January for August-December term and 1st week of May for January-May term. Certificates will be issued on or after the date of announcement of results and against surrendering the Identity Card.

IDENTITY CARD

Participants will be issued identity cards which should be shown on demand. The participants who have successfully completed should surrender the ID card at the time of receiving certificate, failing which the certificate(s) will not be issued to her/him. Police authorized by lodging and compliant and then request the Office-in-charge, CCE to issue duplicate ID during submitting police compliant and Rs. 100/- on penalty In the event of loss of identity card, the matter should be immediately reported to the Section Officer, PROFICIENCE office in writing. NO REQUEST FOR CHANGE OF EITHER THE STIPULATED DATES, MODE OF PAYMENT, CHANGE OF COURSE OR SUBMISSION/VERIFICATION OF ENCLOSURE TO APPLICATION ETC., WILL BE ENTERTAINED UNDER ANY CIRCUMSTANCE

COURSE SCHEDULE FOR JANUARY-MAY 2017
REGULAR COURSES

Sl. No	Name of the Course	Credit	Faculty	Department
1	Advances in EHV / UHV Power Transmission & Distribution (Mon)	2+0	Dr. Subba Reddy B	EE, IISc.
2	Innovative Product Development and Design Methods (Mon)	2+0	Dr. J E Diwakar Retd. IISc. & Prof. P. Achutha Rao	CPDM & NID R&D Campus
3	Introduction to Artificial Intelligence and Applications (Mon & Wed)	3+0	Dr. H K Anasuya Devi	NDRF
4	Project Management (Mon & Wed)	3+0	Dr. Parameshwar P Iyer	MS
5	Renewable Energy Resources: Principles, Technology and Utilization (Mon)	2+0	Mr. Kuruvilla Vargheese & Dr. Saji Salkalachen	DESE/CEDT & Formerly GM & Consultant @ BHEL
6	1D & 2D NMR Spectroscopy: Applications in Structure Biology (Tue)	2+0	Dr. S Raghothama	NMR RC
7	Accounts for Engineers (Tue & Thu)	3+0	Dr. M Krishna Murthy	CSSP IISc.
8	Importance of "Intellectual Property Rights"(IPR) for industries and academia (Tue)	2+0	Dr. J E Diwakar Retd.IISc. & Dr. S Rama Murthy	CPDM & Origin IP Solutions LLP
9	Introduction to the Linux Environment: OS, Command, Utilities and Shell Scripting (Tue &Thu)	3+0	Mr. R Krishna Murthy (retd)	SERC
10	Service Design Thinking (Tue)	2+0	Dr. J E Diwakar Retd. IISc. Prof. P. Achutha Rao & Prof TVP Chowdry	CPDM, NID R&D Campus and Project Scientist CST
11	Strategic Management (Tue & Thu)	3+0	Dr. Parameshwar P Iyer	MS
12	Basic Spectroscopy and Instrumentation (Wed)	2+0	Dr. S Sandhya	IPC
13	Embedded System Design using Microcontrollers (Wed)	2+0	Mr. M Krishna Kumar (retd.)	DESE/CEDT IISc.
14	Introduction to Numerical Grid Generation & Fluid Flow Computations (Wed)	2+0	Dr. P S Kulkarni	AE
15	Vibration and Noise Control in Engineering Structures and Systems (Wed)	2+0	Dr. S B Kandagal	AE
16	Machine Learning of Sensory Signals (Thu)	2+0	Dr. Sri Ram Ganapathy	EE
17	Neural Networks for Signal Processing -1 (Thu & Fri)	3+0	Dr. Shyan Srinivasa Garani	EE & EE
18	Power System Automation towards Smart Grid (Thu & Fri)	3+0	Dr. Gurunath Gurrala & Mr. M Murugesan	EE & CPRI
19	Analysis and Design of Composite Structures (Fri)	2+0	Dr. G Narayana Naik	AE
20	Industrial Internet of Things (IIoT) (Fri)	2+0	Prof. J Srinivasan and Mr. Ganesh Shankar	CAOS & Flux Gen Engg. Pvt.Ltd,
21	Structural Analysis and Design Optimization of Engineering Structures and Systems (Fri)	2+0	Dr. S B Kandagal	AE
22	Advances in Genetic Engineering & Transgenic Technology (Sat)	2+0	Dr. N Ravi Sundaresan	MCBL
23	Basic Concepts of Finite Element Method (Sat) 2 pm to 4 pm	2+0	Prof. P C Pandey (Retd.)	CiE IISc.
24	Basics of Data Analytics (Sat)	2+0	Dr. Gopala Krishna Sharma & Dr. Badarinath Ambati	Fiserv India Pvt. Limited & Altair Engg.
25	Basic Level French Language (Sat) 2 pm to 4 pm	2+0	Prof. M S Mohan Kumar & Mrs. Namratha Nagaraj	CiE IISc & Mount Carmel College
26	Cell and Molecular Biology of Aging and Diseases (Sat) 2 pm to 4 pm	2+0	Dr. N Ravi Sundaresan	MCBL
27	Communication Protocols, Design and Multimedia Applications (Sat) 2 pm to 4 pm	2+0	Mrs. Anandi Giridharan	ECE
28	Introduction to Acoustics (Sat)	2+0	Prof. T S Seshadri	AE IISc.
29	Nonlinear Finite Element Method (Sat)	2+0	Prof. P C Pandey (Retd.)	Civil Engg. IISc.
30	Performance Modeling and Simulation (Sat)	3+0	Prof. Shalabh Bhatnagar	CSA
31	Principles and Applications of Biology Techniques In Research (Sat)	2+0	Dr. P G Vathsala	Under Graduate Programme IISc
32	Smart Design Methods and Processes in Automotive Industry (Sat) 2 pm to 4 pm	2+0	Prof. Anindya DEB & Mr Kalyan Kumar	CPDM &, Abhiyantara Technologies
33	Wireless LANS CONCEPTS, Installation, Troubleshooting and Testing (Sat)	2+C	Mrs. Anandi Giridharan & Mr. Chetan Kumar	ECE & Cisco Systems
34.	Software Test Automation (Sat) 2 pm to 4 pm	2+0	Dr. Gopal Krishna Sharma & Prof. M Sekhar	Fiserv India Pvt. & Civil Engg.

FEE STRUCTURE AT A GLANCE

Regular Courses

Per Credit: Rs.5,000/-

Computer Lab Fee: Rs.5,000/-

1. Course with 2 credits # Rs. 10,000/-

2. Course with 2+C credits # Rs.15,000/-

3. Course with 3# credits # Rs. 15,000/-

4. Course with 3+C $ Credits # Rs. 20,000/-

#credits = Lecture Hours per week

$ C Stands for Computer Laboratory

<u>Regular Courses</u>

<u>Janunary-May 2017 Term</u>

1. ADVANCES IN EHV / UHV POWER TRANSMISSION & DISTRIBUTION (2+0)

Objectives

The aim of the course is to make the participants understand the RECENT ADVANCES IN EHV/UHV transmission and distribution systems which include the basic design principles and critical elements of the power systems.

Syllabus

Energy Sources: Overview of primary and renewable energy sources - present status and future growth with reference to India and global context.

HV Power Transmission/Distribution: AC and DC, present status-future growth, typical components of high voltage transmission system, Insulators, Conductors: various types used for transmission/distribution, towers and foundations: calculations of clearances etc., earth wire/OPGW, selection of Insulators, hardware/ conductor accessories, up-gradation of existing transmission lines.

High Voltage Substations: Typical components, comparison of AIS, Hybrid-AIS and GIS, insulation coordination, metal oxide surge arresters, earthling and safety measures.

Target Group

Industry, Utilities-Electricity boards, R & D, Faculty of Engg Colleges, PG Students etc

Faculty:

Dr. SUBBA REDDY. B
Principal Research Scientist
High Voltage Laboratory, Dept. of Electrical Engineering, IISc
E-mail: reddy@ee.iisc.ernet.in, hvereddy@gmail.com

Reference Books

[1] Gilbert M. Masters, "Renewable and Efficient Electric Power Systems", A JOHN WILEY & SONS, INC., PUBLICATION, 2004

[2] Rakosh Das Begamudre, " Extra High Voltage AC Transmission Engineering", New Age International(P) Ltd, publishers, New Delhi, 2000.

[3]. E Kuffel, W S Zaengl and J Kuffel, "High Voltage Engg. Fundamentals", textbook Newness publishers, second edition, 2000.

Who can apply?

Those with BE /MSc/ AMIE or Equivalent

Course Fee: Rs. 10,000/-

Schedule:

Monday's - 6.00 p.m. to 8.00 p.m.

2. Innovative Product Development and Design Methods (2+0)

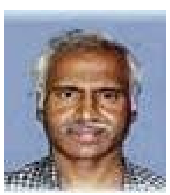
Objective:

The globalization and digital connectivity has forced many organizations to look at the way new products are to be developed for customer acceptance in the changed competitive “global village”. Proven methods of the past which made many companies succeed in the “Sellers’ Market” are no longer valid. The organizations have to develop new approaches for design and innovation to meet the challenges of technology explosion and to increase the speed of development. There is an urgent need to adopt integrated innovative product development strategies to meet the ever-changing customer expectations. This Course aims to look at these issues and create an awareness of innovative product development process and various design methods to achieve success.

Syllaus:

- Creativity and Innovation
- Integrated Product Development
- Product Design
- Industrial design
- Quality Function Deployment
- Value Engineering
- Design to Cost
- Design for assembly and Manufacture
- Design for service
- Failure modes and effects analysis
- TRIZ (systematic Innovation)
- Concept generation methods
- Concept Selection methods

Target Group : Practicing Engineers, Managers involved in design and Development in Industries R&D Organizations etc., Academic Personal involved in teaching/practicing product design and development, fresh Engineers



Faculty:
Dr. J.E. Diwakar (Retd).
Dept. of CPDM, Indian Institute of Science
Email: jed@cpdm.iisc.ernet.in

Faculty:
Prof. P. ACHUTHA RAO

NID R & D Campus, (Retd.)

E Mail: raopanambur@gmail.com

Reference Books:

1. New products Management, Merle Crawford Antonony Di Benedetto; Tata Mcgraw hill Education Private Limited, 2011.
2. Winning at New products, Robrt G cooper; Basic Books, 2011
3. Creating Breakthrough Products: Innovation from Product Planning to Program Approval; Jonathan M Cagan, Craig M Vogel , FT Press, 2010.
4. Product Design and Development,, Karl Ulrich and Steven Eppinger, McGraw-Hill/Irwin, 5th Edition

Who Can apply?

Graduation in Engineering, Graduation in Design, ,
B Tech, M Tech, MSc., MBA & MCA

Course Fee**:** Rs. 10,000/-

Schedule:

Monday’s: 6.00 pm to 8.00pm

3. Introduction to Artificial Intelligence and Applications (3+0)

Objectives:

The course will enable already working professionals in Academic, IT, software and similar industry to understand the importance of AI, its different branches which includes Machine learning, Deep learning, Natural language processing and Expert Management Systems. AI techniques and algorithms knowledge will increase ability tothink boarder providing practical solutions. Automation is the corner stone of value add for present age industry/s, AI partly means Automation. Students are provided opportunity to exchange industry experience and academic knowledge in building AI projects at the end of course.

Syllabus:

Overview of AI – Knowledge Structures – Knowledge Engineering – Knowledge Representation – Knowledge Acquisition – AI perspectives for Managers - Logic Programming – Problem Solving Strategies – Inference and Control - Reasoning Techniques – Forward and Backward Chaining - Laboratory Work, Assignments and Problems – Agent Based Algorithms and Computing - Knowledge Based Systems – Machine Learning – AI Applications - Expert Systems –Natural Language Processing – Pattern Recognition - Artificial Neural Networks – Project Work - Industry Applications Artificial Intelligence vs IOT convergence and divergence points in terms of its uses relevant to industry.

Target Group

R&D Units, Defense, College Teachers , Managers , IT professionals / suited for IT companies looking more on automation and Machine learning

Faculty:

Dr. G. NARAYANA NAIK,
Principal Research Scientist,
Dept. of A E, IISc.
Bengaluru- 560 012.

E-mail: gnn@aero.iisc.ernet.in / gnnindia1@yahoo.co.in

Faculty:

Dr. H.K. ANASUYA DEVI

Prof. Research Lead & Tech. Advisor
NDRF

E-mail: hkadevi@yahoo.com

Reference Books

1. Satish Kumar, Neural Networks, Tata McGraw-Hill, 2004
2. 2'George F Luger Artificial Intelligence: Structures &Strategies for Complex Problem Solving, Pearson Education (IV Ed), 2002.
3. Elaine Richie & Kevin Knight Introduction to Artificial Intelligence, Tata Mcgraw-Hill, II Ed, 1999.

Who can apply?

Those with B. E./M.Tech /MCA/MBA/PG in Science/PhD in Science OR equivalent

Pre-requisite:

Knowledge of Mathematics upto graduation with knowledge of programming.

Course Fee: Rs. 15,000/-

Schedule:

Mon & Wed - 6.00 pm to7.30 pm

4. Project Management (3+0)

Objectives:

To impart knowledge and skills in the art of managing projects scientifically, so as to fulfil objectives Within the constraints of time, cost, and other resources. In addition, exposure to technical communication and software for project management will be provided.

Syllabus:

Introduction, need for project management; Systems approach; Work definition and breakdown; schedulin and network analysis; Costing, budgeting and financial assessment; Project control and management; Project Organisation; Leadership and teamwork; Role of computers in project management. Managerial Communication process; Technical communication; Case analysis; Oral communication and presentations of Study projects.

Target Group:

Scientists, Engineers, Managers of R&D, Administrators, Entrepreneurs in Knowledge-based organisation

Faculty:

Dr. Parameshwar P Iyer
Dept. of Management Studies, IISc.

E-mail: piyer@mgmt.iisc.ernet.in

Reference Books

1. Parameshwar P Iyer Engineering Project Management with Case Studies, Apex Publishing,2007.
2. J R Meredith and S J Mantel Project Management: A Managerial Approach. John Wiley and Sons, Inc., 1995.
3. Windschuttle K and Elliot E Writing, Researching, Communicating: Communication Skills for the Information Age, Irwin McGraw Hill, Sydney, 1999

Who can apply?

BE / B.Tech or PG in any discipline or Equivalent

Course Fee: Rs. 15,000/-

Schedule:

Monday & Wednesday's: 6.00 pm to 7.30 pm

5. Renewable Energy Resources: Principles, Technology and Utilization (2+0)

Objectives:

To Provide a survey and stimulate interest in:

1. Renewable energy resources – Working principle, generation technologies and utilization
2. Solar Photovoltaics – Materials, processes, manufacturing & power systems.

Syllabus:

Renewable Energy Resources**:** Green House Effect, low-carbon technologies. Introducing renewable energy sources: Biomass, Hydro, Tidal, Wind, Wave, Geothermal and Solar (Thermal/Photovoltaics). Working principles, Power generation and Techno-Economic advantages & disadvantages, Environmental impact.

Solar Photovoltaics**:** Semiconductor principles; Solar cell design, operation and characteristics. Silicon material & manufacturing processes of silicon wafer, solar cell and PV module. Crystalline versus Thin Film solar cells. Types of PV Systems/Power Plants, Balance of System, Performance Ratio/Capacity Utilization Factor. Photovoltaic versus Conventional Power. Life Cycle Assessment of Energy Sources, Energy Pay Back Time (EPBT) & Carbon footprint, Carbon dioxide equivalent (CO_{2e}) in units of $gmCO_{2e}$/kWh. Levelized Cost of (Renewable) Electricity

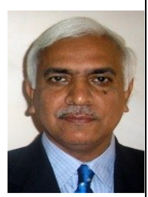
Target Group:

Students (Engg & Science), Faculty (Engg & Science), Professional Staff (Renewable Energy/Solar Industry)

Faculty:
Mr. Kuruvilla Varghese

Principal Research Scientist, DESE, Indian Institute of Science, Bangalore 560012.

Email: edkuru@dese.iisc.ernet.in



Faculty:
Dr. Saji Salkalachen

(Ex-GM & Consultant in Photovoltaics @ BHEL, Bangalore)

Email: sajisalk@gmail.com

Reference Books

1. Renewable Energy: Boyle, Godfrey, 2012 (3rd Ed), Oxford University Press, 566 pages.
2. Solar Cells: Operating Principles, Technology & Systems Application, Martin A. Green, Prentice Hall, Prentice Hall 1982.
3. Physics of Solar Cells: From Basic Principles to Advanced Concepts, Peter Wurfel, 3rd Ed., 2009.
4. Renewable Energy Resources, John Twidell & Tony Weir, 2015 (3rd Ed), Routledge
5. Photovoltaics: Devices, Systems and Applications, Christiana Honsberg and Stuart Bowden, pveducation.org

Who can apply?
BE/B.Tech/AMIE/ M.Sc.

Pre-requisite**:**

Interest in Renewable Energy/Solar Photovoltaic Power

Course Fee: Rs. 10,000/-

Schedule: Monday's 6.00 pm to 8.00 pm

6. 1D & 2D NMR SPECTROSCOPY: APPLICATIONS IN STRUCTURE BIOLOGY (2+0)

Objectives:

To provide exposure to NMR Spectroscopic techniques. Being a powerful technique, it has wide applications in various fields. The course focuses on structure biology with a special stress on peptide structures.

Syllabus:

History and introduction, 1D-NMR: Chemical shift, Scalar coupling, T1 and T2 relaxation, Nuclear Overhauser Effect, Introduction to biomolecules, Ramachandran Map, 2D NMR: Homonuclear experiments - COSY, TOCSY, NOESY, Heteronuclear experiments: INEPT, DEPT, HSQC, Application to peptides and proteins: structures by NMR

Target Group:

This course would widely benefit Industry (Pharmaceuticals), R&D Labs.

Faculty:

S RAGHOTHAMA
NMR Research Centre, IISc.
E-mail: sr@nrc.iisc.ernet.in

Reference Books

1. A E Derome Modern NMR Technique for Chemistry Research Pergamon Press.
2. James Keeler Understanding NMR Spectroscopy, John Wiley & Sons.
3. T D W Claridge High Resolution NMR Techniques in Organic Chemistry, Pergamon Press.

Who can apply?

Those with Masters in Science OR equivalent

Pre-requisite:

Some exposure to NMR

Course Fee: Rs.10,000/-

Schedule: Tuesday's 6 pm t0 8 pm

7. Accounts for Engineers (3+0)

Objectives:

To have basic accounting Knowledge to Engineer working in various sectors.

Syllabus:

- Nature and Purpose of Accounting, Learning Basics of Accounts.
- Income Measurement, Revenue Recognition.
- Financial Statements- Preparation of Trail Balance, P & L Account, & Balance Sheet, & Depreciation accounting.
- Budgeting – Flexible Budget, Cash Budget, Production Budget.
- Cash Flow statements and Ratio Analysis.
- Concepts and Elements of Cost, Cost Sheet, CVP Analysis, Breakeven Point, Marginal Costing; Cost Analysis for Decision Making: Dropping a Product, Pricing a Product, Make or Buy and Product Mix Decisions.
- Contract Costing and Process Costing.

Target Group:

Engineer working in Industry and R & D Division

Faculty:
Dr. M Krishna Murthy
CSSP, IISc.
E-mail: sr@nrc.iisc.ernet.in

Reference Books	Who can apply?
1. Accounting Principles, R N Anthony and J S Reece 2. Financial Accounting, Tulisian 3. Advanced Accountancy, Jain & Narang	Those with Masters in Science OR equivalent Course Fee: Rs.10,000/- Schedule: Tuesday’s 6pm to 8 pm

8. Importance of “Intellectual Property Rights”(IPR) for industries and academia (2+0)

OBJECTIVES:

With emphasis on startup India and innovate India, a course on IPR would be extremely useful to create an IPR culture among startups, academia and industries. The main objectives are

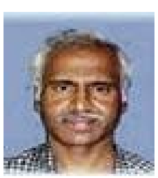
1. to teach the importance of all types of IPR
2. to identify the inventions which can be protected by several tools of IPR
3. commercialization of IPR

SYLLABUS :

1. Tools of IPR such as Patents ,copyrights, trademarks, trade secrets, industrial design, geographical indication
2. Acts governing IP assets in India.
3. Various types of prior art search
4. Identification of inventions which can be protected by various tools of IPR
5. Valuation and Auditing of IPR
6. Commercialization of IPR
7. Case studies of infringements
8. Project work based on the participant’s domain area of specialization.

Target:

R&D Organizations such as NAL,ISRO, ADE, ADA, teaching faculty members of Engineering colleges, PhD students, M.Tech students



Faculty :
Prof. J. E. Diwakar (retd)
CPDM , IISc.

Email:
jed@cpdm.iisc.ernet.in

Faculty :
Dr. S. Rama murthy
Senior Advisor Origiin
IP Solutions LLP
E Mail : murthy@origiin.com,
murthynatural@gmail.com

Reference Books

1. Intellectual Property Rights: Unleashing the Knowledge Economy Paperback – 2001 by Prabuddha Ganguli
2. Dictionary on Indian Patent Law-2012 by Bindu Sharm & AnitaKalia
3. Intellectual Property: A Handbook for Startups Paperback – February 10, 2016 by Stephen A. Di Biase PhD (Author), G. Sherman H. Morrison (Editor)
4. World Intellectual Property Organization(WIPO) Website and Indian Patent office website

Who can apply?

BE / BTech /MSc /BPharma / MPharma / MBA

Course Fee: Rs. 10,000/-

Schedule: Tuesday’s 6 to 8 pm

9. Introduction to the Linux Environment: OS, Command, Utilities and Shell Scripting (3+0)

Objectives :

This course is an introduction to the Linux operating environment. It covers the organization of Linux, and the major commands and utilities. The course emphasizes the conceptual underpinnings and the use of the commands and utilities through shell scripting to implement useful solutions in the Linux environment. This course deals with the end-user perspective of Linux At the end of the course the user would have acquired a strong background to work effectively in the Linux environment and would be equipped adequately to pursue advanced courses in software development and system administration in the Linux environment.

Syllabus :

OS concepts, Linux overview – key features of Linux, – pros and cons of Linux. Building block approach to problem solving

Key concepts – Processes and Files, I/O redirection and pipes. Key components of the Linux System. File systems – files and directories, file naming and wildcards, file attributes, file permissions. Process creation, process attributes standard process file descriptors. File and Process commands.

Regular Expressions. Important Linux tools like editors, find, grep, awk, sed.

Shell and Shell Scripting: The need for shell, interactive uses of shell, using shell for creating user commands. Detailed coverage of bash shell features – statements, data structure, built-in commands, Environment customization primitives.

Developing useful applications using the Bash shell.

The Course would intersperse lectures with tutorial sessions where examples based on concepts covered would be developed and walkthrough of relevant solutions/scripts would be carried out to reinforce the concepts covered. Practice exercises would further provide opportunities to the students to test their understanding of the concepts covered in the class. The students are expected to use their own computers to try the exercises.

Target Group:

Professionals in the Industry and Academic environments who wish to work in the Linux Environment

Faculty

Mr. R Krishna Murthy (retd.)

Dept. of SERC IISc.

Email : arkay.murthy@gmail.com

Reference Books

1. A Practical Guide to Linux –Mark Sobell, Addison Wesley, 1997
2. A Practical Guide to Linux commands ,Editor and shell programming Mark Sobel, Practice Hall
3. Bash Reference Manual. Downloadable from GNU Project.

Who can apply?

B.E., B.Tech, MCA, MSc.

Course Fee: Rs. 15,000/-

Schedule:

Tuesday & Thursday’s: 6.00 pm to 7.30pm

10. Service Design Thinking (2+0)

Objectives :

The globalization and digital connectivity has forced many organizations to look at the way new products/services are to be developed for customer acceptance in the changed competitive “global digital world”. The economy is shifting from manufacturing economy to Service and Knowledge economy. Service economy is an economy based on providing services rather than manufacturing or producing goods.

There is increased importance of the service sector in industrialized economies. The current list of Fortune 500 companies contains more service companies and fewer manufacturers than in previous decades. Many products are being transformed into services. Design of services is gaining more prominence and becoming a specialized field of expertise. This course will look at various aspects of service design thinking. The participants will become aware of many aspects of service design.

Syllabus :

- Innovation, Creativity, Embedded mindset to creative thinking. Barriers to creativity.
- Product economy to Service Economy
- Service design Thinking
- Fields of service design
- Principles of Service Design
- Marketing: connecting with people, creating customer Value
- Product design: Developing products with Service applications
- Social design: Delivering Positive social impact
- Strategic Management
- Operations management
- Tools of Service design thinking Tools of service design

Target Group:

Practicing Engineers, Managers Responsible for developing engineering services, Professional in Design and Development in Industries, R & D Organizations etc., Academic Personal in teaching/practicing Product design/Service design, Product engineering, Design and Development and fresh engineers interested in Design and Innovation; Start up entrepreneurs.

Faculty

Prof. P. ACHUTHA RAO

NID R & D Campus, (Retd.)

E Mail:

raopanambur@gmail.com

Faculty

Prof. TVP Chowdry

Project Scientist CST

E mail: tvpchowdry@gmail.com

Reference Books

1. This is Service Design thinking: Basics, Tools Cases: Marc Stickdorn; Wiley
2. Service Design: From insight to implementation; Andy Polaine, Rosenfeld Media
3. Change by design: How Design Thinking Transforms Organizations and Inspires Innovation; by Tim Brown
4. Designing Services with Innovative Methods: Satu Miettinen, Mikko Koivisto; University of Art and Design Helsinki

Who can apply?

Graduation in Engineering, Graduation in Design, ,

B Tech, M Tech, M Sc, MBA & MCA

Course Fee**:** Rs. 10,000/-

Schedule**:** Tuesday’s**:** 6.00 pm to 8.00pm

11. Strategic Management (3+0)

Objectives:

To teach basic concepts and practices in strategic management. To provide the participants the opportunity to make actual strategic decisions, realizing that the rationale for the decisions will be more important than the actual decisions themselves. Taught as a capstone course in MBA Curricula, this course will cover all aspects of mastering business policy and strategic management.

Syllabus:

Concept of strategic management; Vision and mission; External environment; Internal assessment; Strategies in action; Strategic analysis and choice; Implementing strategies: management issues; Marketing, finance, R&D, and Information Technology issues in Strategy; Strategic Management Cases.

Target Group:

All engineers and scientists in industry and research organizations, who have a stake in charting the organizational strategy.

Faculty:

Dr. Parameshwar P Iyer
Dept. of Management Studies, IISc.
E-mail: piyer@mgmt.iisc.ernet.in

Reference Books

1. Fred R. David, 2001. Strategic Management: Concepts and Cases. Prentice Hall, USA
2. G. Johnson and K. Scholes, 1996.
3. Exploring Corporate Strategy: Text and Cases. Prentice Hall India.
4. R. Das, 2000. Crafting the Strategy.Tata McGraw Hill

Who can apply?

B.E./ B.Tech./ M.Sc. or Equivalent

Course Fee: Rs. 15,000/-

Schedule:

Tue & Thu 6.00 to 7.30 pm

12. Basic Spectroscopy and Instrumentation (2+0)

OBJECTIVES:

To Understand the basic principles and techniques of various spectroscopic methods. This course addresses various aspects of spectroscopic analysis relevant to both research and Industry.

SYLLABUS:

Introduction to separation techniques, Principle, Instrumentation and application of UV-Visible, Infrared, Raman and Fluorescence Spectroscopy, HPCL and Mass Spectroscopy for the identification of unknown compounds.

Target Group:

Academic Institutions and R & D Units.

Faculty **:**

Dr. S Sandya

Inorganic and Physical Chemistry, IISc.

Email: sandya@ipc.iisc.ernet.in

Reference Books

1. D L Pavia, G M Lampman and G S Kriz "Introduction to Spectroscopy" 3rd Edition 2001
2. H Kaur, "Spectroscopy"
3. Joseph R Lakowicz "Principles of Fluorescence Spectroscopy" Spinger Science

Who Can apply?

M.Sc. In Chemistry / Physics / Life Sciences

Course Fee**:** Rs. 10,000/-

Schedule**:**

Wednesday's: 6.00 pm to 8.00 pm

13. Embedded System Design using Microcontrollers (2+0)

OBJECTIVES:

To Train Engineers to design and develop Microcontroller based products.

SYLLABUS:

8051 Architecture, Software, Hardware interfacing with real world, Case studies of Projects, Overview of 16/32 bit Microcontrollers**, Design with Arduino boards.**

Target Group:

Electronic Industries, R & D Units like NAL, BHEL, BEL

Faculty :
Mr. M Krishna Kumar Retd.
CEDT, IISc.

Email: mkkumarcedt@gmail.com

Reference Books:

1. Microcontrollers by Kenneth Ayala.
2. The 8051 Microcontroller & Embedded Systems by M.A.Mazidi et. al.
3. NPTEL Notes (by M Krishna Kumar) on Microprocessors Microcontrollers

Who Can apply?

BE Electronics , Electrical , Instrumentation , Computer Science, Practicing Engineers, MCA

Pre Requisites **:** Basic Electronics

Course Fee**:** Rs. 10,000-

Schedule**:**

Wednesday's : 6.00 pm to 8.00 pm

14. Introduction to Numerical Grid Generation and Fluid Flow Computations (2+0)

Objective:

To impart basic knowledge in fluid dynamics, and numerical methods used in computational fluid dynamics to a beginner. CFD has become a very important tool in design and analysis. It is necessary to understand the basic concepts of Mesh generation, governing equations of fluid dynamics and numerical methods. To impart certain CFD expertise to a practicing CFD Engineer in an industry.

Syllabus:

Introduction and Relevance of CFD, Governing equations of fluid dynamics and their various levels of approximations; Behaviour of Partial Differential Equations (PDE). Introduction to discretization, Various numerical techniques, FDM and FVM. Time Marching and Space Marching methods. Introduction to geometrical aspects of simple and complex bodies; Grid/Mesh generation Methods; Algebraic, PDE based Mesh generations with examples.

Target Group:

Aerospace Industries / National Laboratories/Private sectors involved in Fluid flow studies, Teaching Faculty in Colleges

Faculty:

Dr. P S KULKARNI

Computational Mechanics Lab,
Dept. of Aerospace Engg / JATP, IISc, Bengaluru

E-mail: psk@aero.iisc.ernet.in / pskdhar@gmail.com

Reference Books

1. Joe F Thompson,Warsi Zua & Wayne Martin C Numerical Grid Generation: Foundations & Applications, North Holland, 1985.
2. Weatherhill N P Grid Generation
3. John D Anderson, Jr Compuational Fluid Dynamics: The basics with applications, Mc Graw-Hill, Inc., International Edition, 1995.

Who can apply?

Those with B.E./M.Sc. OR Equivalent

Course Fee: Rs. 10,000/-

Schedule:

Wednesday's - 6.00 pm to 8.00 pm

15. Vibration and Noise Control in Engineering Structures and Systems (2+0)

Objectives:

Growing awareness of vibration, noise and harshness feeling has necessitated the valid design criterion in the design of machines, automobiles, buildings, industrial facilities, etc, and the increasing number of standard regulations and human comfort associated with noise, harshness and vibration makes it mandatory to control vibration and noise leading to quieter technology in pumps, engines, compressors, chillers and other consumer products. There is a great demand to enhance ride comfort of bikes, cars, aircrafts and other automobiles. Vehicle Dynamics basics and rowing awareness about noise pollution among the consumer necessitates the OEM companies to stress upon the products without NVH problems. Analytical, MATLAB and FEM based tools such as ANSYS, NASTRON, ABACUS and SYSNOISE helps to achieve the goals of NVH study. This course is for engineers/scientists/entrepreneurs/instructors in the industries/institutes to learn the analytical and experimental skills to tackle the problems related noise, vibration and harshness (NVH) during design and manufacturing stage for technically superior and commercially viable product.

Syllabus:

Vibration of structural systems. SDOF, 2-DOF, MDOF and continuous systems. Eigen values and vector estimation methods. Free and Forced vibration analysis. Torsional vibration and applications. Damping estimation methods

Structural Vibration control elements: isolation, damping, balancing, resonators, absorption, barriers and enclosures. Vibration and noise standards. NVH measurement tools and techniques. Modal parameter (natural frequency, mode shape and damping) estimation techniques. Signal and system analysis. Demonstration of vibration and noise experiments – beam, plates, impulse excitation, electrodynamics shaker excitation, FFT analyzer, stroboscope and mode shape animation, sound level meter, microphones. Vibration transfer function (VTF) and noise transfer function (NTF)

Noise and its effects on man. Acoustic and sound field. Enclosures, shields and barriers-design. Silencer and suppression systems. Noise level interpolation and mapping. Harshness effects and measurements and solutions. NVH Parameters related to vehicle dynamics.

Case studies discussion (vibration reduction in passenger car, tiller, tractors, steering column/wheel vibration diagnosis, Modal analysis of Helicopter, Vibration diagnosis in diesel engine power plant, rot dynamic analysis of DWR and tracking antenna and engine and compressor noise attenuation and vibration isolation, engine-compressor mount design, vibration diagnosis in power plants, gear shift harshness, newspaper printing cylinder vibration diagnosis, engine filter bracket dynamic analysis, noise reduction for mixer grinders, field audit of industrial chimney for wind induced vibration, stability studies of sports bike, aerodynamic stability derivatives of scaled model of aerospace vehicles)

Target Group:

Mechanical, Civil, Aerospace, Automotive, Industrial Engineers, Construction Technologists, R & D Labs, New product design and development groups, entrepreneurs, Engineering college instructors and professionals to pursue higher postgraduate studies.

Faculty:
Dr. S B Kandagal
Dept. of Aerospace Engineering, IISc

E-mail: sbk@aero.iisc.ernet.in

Reference Books

1. Harris, C.W" Shock and vibration handbook" McGraw Hill, New York, 2006.
2. Ewins, D.J." Modal analysis: Theory and Practice", Research Studies Press Ltd, England, 2000
3. Gillespie, T.D., "Fundamentals of Vehicle Dynamics", Society of Automotive Engrs., Inc, 2002.
4. Beranek,L.L," Noise and Vibration Control", Wiley, 1988.

Who can apply?

BE, ME, /M.Sc. AMIE or Equivalent

Course Fee: Rs. 10,000/-

Schedule:

Wednesday's - 6.00 pm to 8.00 pm

16. Machine Learning of Sensory Signals (2:0)

OBJECTIVES:

Understanding techniques which enable machines to derive patterns and take decisions from complex real world signals like text, speech, image and video.

SYLLABUS:

Basics of pattern recognition, Generative modeling with Gaussian mixtures, and Discriminative modeling with support vector machines. Neural networks. Introduction to deep learning, convolutional networks, Applications in audio and image processing.

Target Group:

Industry and Government organizations interested in Artificial Intelligence area - Amazon, Samsung, Google, Microsoft, IBM, Qualcomm, Philips and ISRO / DRDO

Faculty :

Dr. Sriram Ganapathy
Dept. of Electrical Engineering, IISc.

Email: sriram@ee.iisc.ernet.in

Reference Books

1. " Pattern Recognition and Machine learning" Bishop, 2008
2. "Pattern Recognition" Duda and Hart, 1979
3. "Introduction to deep Learning" I Goodfellow, Y Bengio, 2016

Who Can apply?

BE in Electrical Science or Post Graduation in Related field

Prerequisites : Basic Linear Algebra, Basic Probability (Random Process)

Course Fee Rs. 10,000/

Schedule : Thursday 6PM to 8 PM

17. Neural Networks for Signal Processing -1 3+0

Objective:

To gain exposure into the foundations of neural networks and learning algorithms from a theoretical and Practical view point.

Syllabus:

Introduction to Neural Networks, Neuron models motivated by biology, feedback and other network architectures, Knowledge epresentation and artificial intelligence Learning Process: memory-based learning, error-correction based learning, Hebbian learning, competition learning, Boltzmann Learning, Supervised and unsupervised learning methods, memory and adaptation, Statistical nature of the learning processes. Multilayer Perceptron: Perceptron, Perceptron convergence theorem, back propagation algorithm and Applications, XOR problem, functional approximation and course of dimensionality. Radial Basis Function networks: Cover's Theorem for reparability of Patterns, regularization theory and networks, approximation properties of RBFs, kernel regression and Learning strategies, applications. Support Vector Machines: Optimal hyperplane for linear separable patterns and non- separable patterns, SVMS or pattern recognition, epsilon-insensitive loss function, SVMs or non-linear regression, applications. Committee Machines: Associative Gaussian mixture model, hierarchical mixture of experts (HME) model, EM algorithm, Application of EM algorithm to HME. Principal Component Analysis: Eigenstructure of PCA, Hebbian based maximum eigenfilter, Hebbian based PCA adaptive PCA using lateral inhibitions (APEX), PCA based on neural networks: reestimation and decorrelating algorithms, Kernel PCA applications.

TargetGroup:
Data mining,/modeling groups/applied analytics/mathametics/Signal Processing/Local Teachers

Faculty
Dr. Shyan Srinivasa Garani ,
Asst. Professor,
Dept. of ESE, IISc.
Email : shayan.gs.@dese.iisc.ernet.in

Reference Books

1. Neural Networks: A Comprehensive foundation by Simon Hyykin prentice Hall of India.
2. Machine Learning: Probabilistic Perspective. Kevin Murphy, MIT Press

Who Can apply?

B. E. / B.Tech in Electrical Science and Computational; /M.E. /M.Tech (ECE, EE, IT, CS)

Course Fee**:** 15,000/-

Schedule**:**

Thursday's & Friday's: 6,00 pm to 7.30 pm

18. Power System Automation towards Smart Grid (3+0)

Objective:

Power system Automation can be defined as managing, protecting and controlling an electrical power system. Real time information is obtained from systems having local and remote control applications with advanced power system protection. This course deals with the architecture of Power system automation and its usage in the industry along with its future scope and technologies like Smart Grid.

Syllabus:

1. Introduction and Smart Grid Basics
2. Smart Generation: Resources and Potentials
3. Case studies : Implementation of Smart Generation & Storage system worldwide
4. Requirements Engineering for Smart Grids
5. Development of Smart Grid Architectures
6. Sensing, Measurement, Control and Automation Technologies.
7. Design of Distribution Networks and the Impact.
8. Smart Operation and Observability at the Transmission Level
9. Communications Needs of Smart Grids. Advanced Information and Communication Technology: The Backbone of Smart Grids.
10. Role of Power Electronics in Smart Grid
11. Policy and Regulatory Framework including various legislations passed by many countries worldwide.
12. Information security for the Smart Grid. Standards for Information security for the Smart Grid
13. Requirement of Standardization in Smart Grids. International Smart Grid Standardization roadmap activities.
14. Testing in the Smart Grid: Testing for Unit, Proto Type, Integrating, System Testing, Acceptance Testing, Testing for interoperability, Conformance Testing etc.
15. Case studies : Implementation of Smart Grids Worldwide

Target Group: Faculty members, academic, practicing Engineers, Consultants, Students

Faculty
Dr. Gurunath Gurrala
Assistant Professor,
EE , IISc.
Email:
gurunath@ee.iisc.ernet.in

Faculty
Mr. N.Murugesan,
Former Director General
CPRI Bengaluru

Email nmurugesan@yahoo.com

Reference Books

1. Control and Automation of Electrical Power Distribution Systems by James Northcote-Green Robert Wilson Abasis – 2007- Taylor & Francis.
2. Network Protection and Automation, Guide Edition-MAY 2011, Alstom T & D.
3. Electric Power Distribution, Automation, Protection and Control by James A. Momoh- 2007- CRC Press
4. Substation Technical Guide- Moxa .com
5. Communication Networks for Smart Grids – Making Smart Grid Real Kenneth C. Budka, Jayant G. Deshpande, Marina Thottan- 2014- Springer.
6. Smart Power Grid: A Holonic Approach- 2014-Proefschrift

Who Can apply?

B.E (Electrical/ Electronics/ Communication/ IT/ Computer Science)

Course Fee: 15,000/-

Schedule:

Tursday's & Friday's: 6,00 pm to 7.30 pm

19. Analysis and Design of Composite Structures (2+0)

Objectives:

Composites are future materials and have been finding applications in all fields of Engineering (Aero, Civil, Mechanical, Automobile, Marine, Chemical, Electrical, Electronics etc). Many FEM software packages like ANSYS, MSC-NASTRON, PATRAN, ABACUS, LS-DYNA, etc are available for analysis & Design. One should first understand the Mechanical behavior of the Composite Structures before using FEM packages for better quality of professional work and optimum usage of time, computing and human resources.

Syllabus:

Introduction: Basic Concepts and Terminology, different types of fibers and matrices, their properties and applications. Micromechanics of Composites: Prediction of properties, etc. Macromechanics of Lamina: The theory of elasticity, Constitutive equations of a lamina, transformations, numerical examples.Failure theories for composite lamina, numerical examples. Mechanics of Laminated Composites: Development of ABD matrices, Analysis of laminates, numerical examples etc. Hygrothermal Analysis, numerical examples. Bending Analysis of Beams, numerical examples. Analysis of Laminated composite plates: Classical and first order theories, Energy Method, Boundary conditions, numerical examples. Buckling analysis of plates, numerical examples. Design of laminates using Carpet plots, AML plots, numerical examples.

Target Group

1. Technologists/ Engineers/ Scientists/ Trainees/ Project Staff/ etc from Industries, R & D Organizations, Institutions, Colleges etc.
2. Faculty of Engineering/ Diploma Institutions etc.
3. Fresh Graduates, Post Graduates, Ph.D. Students, Research Fellows, SRFs, JRFs, Project Assistants/Associates etc.

Faculty:

Dr. G. NARAYANA NAIK,
Principal Research Scientist,
Department of Aerospace Engineering,
Indian Institute of Science, Bengaluru- 560 012.

E-mail: gnn@aero.iisc.ernet.in / gnnindia1@yahoo.co.in

Reference Books

1. Mechanics of Composite Materials:- Second Edition- Robert M. Jones. McGRAW-HILL KOGAKUSHA, LTD. – Year-1999.

2. Mechanics of Composite Materials and Structures – Madhujit Mukhopadhyay, Universities Press – Engg.- 2004.

3. Mechanics of Laminated Composite Plates and Shells –Theory and Analysis – J.N.Reddy, CRC Press – 2004

Who can apply?

B.E / B.Tech. /AMIE / M.Sc.(Engg.)/M.Sc./ AMAeSI (Engg.) (Mechanical, Aero, Civil, Automobile, Marine, Chemical, Metallurgy, Manufacturing, Ocean, Industrial Engg., Production Engg., Electrical, Electronics, etc) OR Equivalent

Course Fee: Rs. 10,000/

Schedule:

Friday's 6.00 pm - 8.00 pm

20. Industrial Internet of Things (IIoT) (2+0)

Objectives:

To Introduce the State of art of Industrial IotT with smart machines that perform pervasive sensing distinct from M2M communication. The course is a blend of engineering and business of IIoT. It deals with connectivity in industrial networks, building systems to enable delivery of software services net worked to the cloud platforms. At the end of the course the students will be in a position to start an Industrial IoT business.

Syllabus:

The course familiarizes the students to handle INTELLIGENT CYBER-PHYSICAL SYSTEMS.Course unfolds as: Industrial IoT–Introduction- Distinction from IoT sphere – Embedded Systems - Architecture and design - Controller programming - Wireless Technology- Industrial Standard protocols - Mobile application platform - Cloud access and control – Packaging – UI/UX of IIoT products - Business models with IIoT products – Case studies – Launching an IIoT product/service - Entrepreneurship in IIoT

Target Group:

Working professionals in Embedded, Automation, R&D, Resource Management Professionals, Smart Cities and Villages developers, Mobile app developers, Entrepreneurs and Aspiring Entrepreneurs.

Faculty:
Prof. J. Srinivasan
Distinguished Scientist,DCCC,
Honorary Professor,CAOS

Email: jays@caos.iisc.ernet.in

Faculty:
Mr. Ganesh Shankar
Founder & Managing Director of
FluxGen Engg.Tech. Pvt. Ltd.
Bengaluru.
Email: ganesh@fluxgentech.com

Reference Books

1. Enterprise IoT Strategies and Best Practice for Connected Products and Services. – Dirk Slama, Frank Puhlmann, Jim Mirrish, Rishi M Bhatnagar
2. The Internet of Things: Key Applications and Protocols - David Boswarthick
3. The Silent Intelligence, The Internet of Things. By – Daniel Kellmereit, Daniel Obodovski

Who can apply?

B.E / B.Tech. in any branch , ME /M Tech

Course Fee: Rs. 10,000/

Schedule:

Friday's 6.00 pm - 8.00 pm

21. Structural Analysis & Design Optimization of Engineering Structures and Systems (2+0)

Objectives:

Advanced research in material science to enhance the life with reduced cost resulted in metal alloys, plastics, composites and nano materials. Structural design and optimization of components with unusual shapes became possible with current available finite element software tools such as ANSYS, NISA, NASTRON, ABACUS, SYSNOISE, LSDYNA and MATLAB etc. The fundamental knowledge of stress, strain, and shear, torsion in relation to the structures and S-N curves in relation to the material becomes important. The interpretation of the FEM software output calls for the knowledge of analysis and design optimization of mechanical systems. This course essentially trains engineers / scientists / entrepreneurs /instructors in the industries/institutes to optimally design various mechanical systems and sub-systems for technically superior and commercially viable value added product.

Syllabus:

Applied mechanics, Strength of materials, SFD, BMD, solid mechanics, concept of stress, strain and fatigue. Constitutive laws. Mohr's Circle, Engineering materials and their properties. Structural analysis concepts, tension, compression, shear, torsion and S-N curves. Design of beams, torsion, compression members and fasteners. Stability of structures. Composite materials and their importance in structural analysis design optimization.

Principles of optimization, formulation of objective function and design constraints, classification of optimization problem. Single and multivariable optimization. Optimization with equality and inequality constraints.

Optimal design of mechanical elements – fasteners, springs, gears, bearings, belts, clutches, brakes, shafts and axles. Procedures for product design, development and testing. Vibration of structures.

Case studies in structural analysis and optimal design of industrial products**.** (optimization of passenger car sub systems for vibration and noise reduction, Rail-coach CBC couplers, Car door window regulator, satellite tracking antenna and DWR antenna design, Tractor canopy, hydraulic crawler driller (drilling machine), Bike brake system, sluice valve design, failure analysis if piston drill bit, thermally insulated box, IP turbine blade failure analysis, design analysis of super pump impeller, Structural design aspects in power plants. Hydraulic jacks/Feed cylinder with intermediate supports, Industrial chimney design, optimization of box culverts, metal-composite sprocket for bikes, Thermal Analysis of heat exchangers, 6-DOF force balance, pitch flexure design for wind tunnel model studies for aero dynamic derivatives of aerospace vehicle and automobiles).

Target Group:

Mechanical, Civil, Aerospace, Automotive, Industrial engineers, R & D Labs, Construction technologists, New product design and development groups, Entrepreneurs and Engineering college instructors. Professionals to pursue postgraduate and higher studies.

Faculty:

Dr. S B Kandagal

Dept. of Aerospace Engineering, IISc

E-mail: sbk@aero.iisc.ernet.in

Reference books

1. Beer F P and Johnson, E.R, "Vector Mechanics for Engineers- Statics and Dynamics", Tata-MacGrawhill, sixth Edison, 2005.
2. Shigley, J.E and Mischke, C.R., "Mechanical engineering design" Tata-MacGrawhill, sixthEdison, 2003.
3. Johnson Ray, C." Optimum design of mechanical elements", Wiley, John & Sons,2006.

Who Can apply?

BE, ME, M.Sc, AMIE or Equivalent

Course Fee: Rs.10,000/-

Schedule:

Friday's : 6.00 pm to 8.00 pm

22. Advances in Genetic Engineering & Transgenic Technology (2+0)

Objectives:

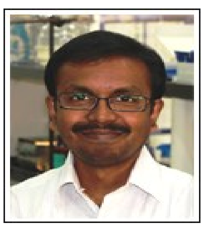
This course is proposed for those who wish to develop a strong background in technologies and principles involved in Genetic Engineering and generation of genetically modified experimental organisms.

Syllabus:

Construction of plasmid vectors, recombinant protein production in bacteria, yeast, and mammalian cells- Genome editing approaches such as TAL effector nucleases, Cas9/CRISPR-- and zinc finger nuclease technology- Next Generation Sequencing- Exome Sequencing- - ChIP-Sequencing-Real time Quantitative PCR -Site directed mutagenesis -Protein Sequencing - RNA interference- RNAi, Letiviral, retroviral and Adenoviral vectors- Gene therapy- Genetic Engineering of mammalian stem cells, Generation of induced pluripotent stem (iPS) cells, Mitochondiral genome editing. - Somatic cell nuclear transfer- Lentiviral and BAC transgenesis - Generation of transgenic and mutant Caenorhabditis elegans- Production of transgenic zebrafish and Xenopus- Generation of knock-out mice (Isolation and culture of embryonic stem (ES) cells, Gene targeting construct design, Transfection, Homologous recombination in ES Cells, Positive and negative selection; blastocyst injection, Breeding of germ-line chimeras Cre/lox and Flp/FRT system for inducible transgenics - Chemically inducible transgene expression systems. Use of transgenic technology in the modeling of human diseases, including cardiovascular diseases, diabetes, obesity, cancer, atherosclerosis, neurodegenerative diseases, muscle degeneration and aging.

Target Group:

- College students (Veterinary, Pharmacy, Biotechnology & Medical)
- Industry (Pharmaceutical Companies & Biotech Companies)
- Researchers, Postdocs and students in the field of biological sciences



Faculty:
Dr. N. RAVI SUNDARESAN
Assistant Professor,
Microbiology and Cell Biology,
Indian Institute of Science

Email: rsundaresan@mcbl.iisc.ernet.in,

Reference Books

1. Principles of Gene Manipulation and Genomics by Sandy B. Primrose, R. Twyman Oxford press; 7th edition.
2. Transgenic Animal Technology: A Laboratory Handbook. Carl A. Pinkert Elsevier Science Publishing Co Inc; 3rd Revised edition.
3. Transgenic Mouse Methods and Protocols (Methods in Molecular Biology) Marten H. Hofker, Jan van Deursen. Humana Press.2nd Edition.

Who Can apply?

B.Tech., B.Pharm., B.V.Sc., BS/M.Sc., M. Pharm., M.V.Sc., MS (Biotech), M.B.B.S., or Equivalent

Course Fee: Rs.10,000/-

Schedule:

Saturday's : 10.00 am to 12.00 Noon

23. BASIC CONCEPTS OF FINITE ELEMENT METHOD (2+0)

Objectives:

This is a foundation course in Finite Element Method (FEM) aimed at Civil, Mechanical and Aerospace Engineering professionals. In particular, it would be beneficial to engineers who do not have any formal training in FEM, even though; they may have skill to use a FEM package. The course is designed to provide a basic introduction to FEM with emphasis on stress and structural analysis. It is believed that it would be of interest to engineers working in industries, consulting firms, and teachers of engineering colleges.

Syllabus:

Concept of Stiffness and Flexibility in structural analysis. Basic foundations of elasticity and energy principles. Introduction to displacement based FEM with reference to continuum and skeletal structures. Element formulation and Applications to Plane stress, Plane strain, Axisymmetric, and 3-D problems. Isoparametric concept, Equation solvers, Post-processing, Adaptivity, Programming and Computational aspects as well as practical applications would be discussed

Faculty:

Prof. P. C. Pandey (retd.)

Dept. of Civil Engineering, IISc

E-mail: pcpandey@civil.iisc.ernet.in, profpcpandey@yahoo.com

Reference Books

1. Logan Daryl L A first Course in Finite Element Method Thomson 5th Edition 2012
2. Chandrupatala, T. R., and Belegundu A D Introduction to Finite Elements in Engineering, Prentice Hall - Indian Edition, III Ed, Aug 2003.
3. Cook, R. D. et.al Concept and Applications of Finite Element Analysis, John Wiley & Sons, 2002. (IV Edn)

Who can apply?

Those with B. E./B.Tech (Civil/Mechanical/Aerospace) OR equivalent

Course Fee: Rs. 10,000/-

Schedule:

Saturday’s : 2.00 pm. to .4.00 pm

24. Basics of Data Analytics (2+0)

Objective:

To Introduce Concepts of data analysis, Laying the foundation for statistical analysis and forecasting.

Syllabus:

Analytics, Basics of Probability and Statistics, Sampling, Trend, Cyclicity and Seasonality, Introduction to Forecasting, Smoothing and Regression Techniques. Auto Regression and Time Series, AR and MA Models, ARMA, ARIMA, and Concepts of Stochastic Processes.

Target Group:
IT, Retail, Banking etc.

Faculty
Dr. Gopal Krishna Sharma

Fiserv India Pvt. Limited, Bengaluru

Email : gopalaks@yahoo.com

Faculty

Dr. Badarinath Ambati

Altair Engineering, Bengaluru

Email : abadarinath@yahoo.com

Reference Books:

1. Introduction to Probability with R Kenneth Baclawsk Chapman and Hall, Feb 2008
2. Forecasting Methods and Applications Spyros Makridakis and Steven C Wheelwright Wiley, 1998
3. Statistical Methods for Forcasting by Bovas Abraham & Johannes Ledolter.

Who Can apply?
B.E. M.E / Post Graduation

Course Fee: 10,000

Schedule:
Saturday's: 10.00 am to 12.00 Noon

25. Basic Level French Language (2+0)

Objectives:

The French language course aims at giving a basic working knowledge at work place/social setting. Written-grammar/socio-cultural themes. Oral-dialogue and phrases in a social situation

Syllabus:

Conjugation of verbs, Articles, pronouns, adjective, prepositions, negation, idioms, letter writing, spoken French, role plays, translation, adverbs, comparison and superlatives.

Target Group:

Technology in France is thriving. Learning French for scientists, research scholars benefit from this course

Faculty:
Prof. Mohan Kumar M S
Chairman
Indo-French Cell

Email :
msmk@civil.iisc.ernet.in

Faculty:
Ms. Namratha Nagaraj
Part Time Lecturer at Mount Carmel college, Bengaluru 52.

Email:
namarathanagraj@hotmail.com

Reference books

1. Alter Ego +(1)-Catherine Hugo/ Veronique.M.Kizian / MoniqueWaendendries
2. Echo A1-J.Girardet/J.Pecheur
3. Learn to speak french workbook-Lind.S.Leppig

Who Can apply?

B.Tech., B.Pharm., BVSc., BS/M.Sc.,M Pharm., MVSc., MS (Biotech), MBBS or Equivalent

Course Fee**:** Rs.10,000/-

Schedule:

Saturday's : 2 pm to 4 pm

26. Cell and Molecular Biology of Aging and Diseases (2+0)

Objectives:

This course is proposed for those who wish to study cell and molecular biology in relation to the aging and the aging-related diseases like diabetes, obesity and heart failure. The course mostly deals with the cellular organelles, cellular signaling pathways and molecular events that cause aging and diseases.

Syllabus:

Cellular homeostasis, organelles, Cellular signaling pathways, Theories of Aging, Hormones involved in aging, Molecular mechanisms of aging- oxidative stress (ROS, RNS etc), damage to proteins and lipids, Damage to DNA and cellular organelles- mitochondria, ribosomes, lysosomes, Defects in Metabolism, Mechanisms of longevity, Caloric restriction, Aging related changes in organs, endocrine system, Aging related metabolic diseases: Diabetes, obesity, atherosclerosis, Aging of the cardiovascular system, heart failure, Aging of the Musculoskeletal Systems, Aging of the immune system, inflammation and aging, Genetic of Aging and Exceptional Longevity in humans, Strategies to avoid aging and aging-related diseases. Model organisms to study aging, Drugs that have potential to extend longevity

Target Group:

- College students (Veterinary, Pharmacy, Biotechnology & Medical)
- Industry (Pharmaceutical Companies & Biotech Companies)
- Researchers, postdocs and students in the field of biological sciences

Faculty:

Dr. N. RAVI SUNDARESAN

Assistant Professor

Microbiology and Cell Biology, Indian Institute of Science

Email : rsundaresan@mcbl.iisc.ernet.in

Reference Books

1. Biology of the Cell by Alberts B et al., 2008.
2. Handbook of the Biology of Ageing Seventh Edition, by Edward J Masoro (Editor),
3. Molecular Biology of Aging (Cold Spring Harbor Monograph Series), by Leonard Guarente, 2007.
4. Aging and age- related diseases: the basics by Karasek, M 2006.

Who Can apply?

B.Tech., B.Pharm., BVSc., BS/M.Sc.,M Pharm., MVSc., MS (Biotech), MBBS or Equivalent

Course Fee: Rs.10,000/-

Schedule:

Saturday’s: 2 pm to 4 pm

27.Communication Protocols, Design & Multi Media Applications (3+0)

Objectives:

This is a graduate level course. It is aimed at discussing the Internet Architecture, Communication Protocol standards and protocol Engineering: Protocol specification, verification and conformance testing methods , HTML, XML, Multimedia Applications, Voice Over IP

Syllabus:

This course gives participants theoretical and practical knowledge of internet and its application in various fields: Communication Protocol development methods, Protocol Engineering Process and its phases. Network reference model: OSI model, TCP and IP, application Protocol . Protocol Specification, Using FSM, Protocol specification using SDL, Protocol Verification and Validation, Protocol Conference Testing, HTML, XML, Multimedia applications, IP telephony.

Target Group :
Working Professionals, students and Researchers

Faculty:

Mrs. ANANDI GIRIDHARAN
Senior Scientific Officer,
Dept. of ECE, IISc.

Email: anandi@ece.iisc.ernet.in

Reference Books

1. Communication Engineering, Pallappa Venkataram, Sunil Kumar S Manvi, B Satish Babu., PHI Learning Private Limited, 2nd Edition, FEB 2014.

2. Computer Networks–Fourth Edition By Andrew S Tanenbaum, 2003

3. Wireless Communications and networks-2nd Edition by William Stallings, 2005.

Who can apply?

B.E. /B.Tech /M.Tech
(ECE,Electrical,Computer Science, Information Technology)

Course Fee: Rs. 15,000/-

Schedule:

Saturday's: 10.00 p.m. to 1.00 p.m.

28. INTRODUCTION TO ACOUSTICS (2+0)

Objectives:

To Learn Fundamental Principles of Acoustics which would be useful in areas of noise control, underwater acoustics, architectural sensing, medical ultrasonics

Syllabus :

Wave theory and Measurement of sound, reflection and transmission at interfaces, vibrating surfaces as sources. Sources in the presence of wall boundaries. Theory of Room acoustics. Low frequency models and ray acoustics.

Target Group :

All Engineers working in areas where music, sound, noise is involved.

Faculty:

Prof. T S Seshadri

Dept. of Aero Space Engineering, IISc

E-mail: tss@aero.iisc.ernet.in

Reference Books

1. Acoustics Allan D Pierce Mc Grow Hill Book Company

Who can apply?

Those with B. E./M Sc. In Physcis / Maths

Course Fee: Rs. 10,000/-

Schedule:

Saturday's: 10 pm. to .12 Noon

29. Nonlinear Finite Element Method (2+0)

Objectives:

This is a second level course covering some advanced topics in Finite Element Analysis. In particular, focus would be on Concepts and techniques of Nonlinear Finite element Analysis in this course. Nonlinear FEM techniques are usually not covered in the first course of FEM. The FEM treatment of Nonlinear problems requires additional background of the inelastic behavior of materials and nonlinear-mechanics for better understanding but, such options are generally not available to graduate engineers or even to post-graduates. However, practicing engineers, especially structural analysts and designers, usually come across many practical problems which require nonlinear finite element analysis. Most of the commercial packages do have nonlinear analysis facilities. However, even to use such packages a good understanding of Nonlinear Finite Element analysis techniques is required. The objective of this course is to introduce basic concept of nonlinear finite element analysis with reference to solid mechanics applications.

Syllabus:

Review of linear FEM with reference to Isoparametric 2-D and 3-D finite elements. Concept of Material, Geometric and Contact nonlinearities. Elements of Nonlinear Mechanics, Constitutive relations using Plasticity. Finite-Deformation, Finite Element Formulation of nonlinear problems in Solid Mechanics. General Solution Techniques, Computational Aspects and application.

Faculty:
Prof. P. C. Pandey (retd.)
Dept. of Civil Engineering, IISc

E-mail: pcpandey@civil.iisc.ernet.in, profpcpandey@yahoo.com

Reference Books

1. Cook, R. D., et.al,
Concepts & Applications of Finite Element Analysis, John Wiley & Sons, 2002 (IV Ed)

2. Zienkiewicz, O. C., and Taylor, R. L.,
The Finite Element Method, V Edn., Vol 1 & 2, McGraw-Hill, 2002 (V Ed.).

3. Reddy J N
An Introduction to Nonlinear Finite Element Analysis, Oxford University Press Inc, Oxford, 2004.

Who can apply?

B. E. /B.Tech /M.E (Civil/Mechanical/Aerospace) OR Equivalent

Pre-requisites:

Basic knowledge of solid mechanics. An exposure to basic Finite Element Method

Course Fee: Rs.10,000/-

Schedule:

Saturday's 10am to 12 noon

30. Performance Modeling and Simulation (3+0)

Objectives:

The course will deal with probability models as well as various aspects of simulation with the aim of studying performance modeling and analysis of systems. The course will give sufficient knowledge of the tools and techniques necessary to model and analyze complex discrete event systems.

Syllabus:

Probability theory-basics, conditional probability, Bayes' rule, independence, random variables, distributions, expectation, Variance, covariance, correlation coefficient, moment generating function, discrete event system modeling, Simulation, random number generation, discrete and continuous time Markov chains, performance analysis of single queues and networks, reliability, series and parallel systems, test cases and examples

Target Group:

Industry / R & D / Local colleges

Faculty:
Prof. Shalabh Bhatnagar
Dept. of CSA, IISc.

E-mail: shalabh@csa.iisc.ernet.in

Reference Books

1. D.P. Bertsekas and J.N Tsitsiklis, Introduction to probability, Athena scientific, 2008 (2nd Edition)

2. S.M Ross, Simlation, McGraw Hill, 2012 (5th Edition)

3. K.S. Trivedi, Probability and statistics with reliability, queuing and computer science applications, Wiley, 2001

Who can apply?

B. E. /B.Tech /M.E. /M.Tech /M.Sc

Course Fee: Rs. 15,000/-

Schedule:

Saturday's 10am to 1 pm

31. Principles and Applications of Biology Techniques In Research(2+0)

Objective

The use of old conventional techniques from long time has changed by advanced techniques now available in the field of Biology research. This course provides essential basic principles of the techniques and its comparison with the advanced techniques and its applications.

Syllabus:

Introduction to basic techniques like cell isolation, macromolecules isolation (nucleic acid, lipids and proteins), identification and applications. DNA & RNA purification techniques with principle, application including DNA sequencing techniques. Introduce to in vitro culturing and in vivo experimental methods in biology and their application in research. Introducing radioactivity in biology research.

Target Group:

- R & D Units
- Pharmaceutical and Biotech Companies
- Biomedical Research Institutions
- Any Students (with Biology background

Faculty

Dr P G Vathsala

Senior Scientific Officer,
Undergraduate Programme,
Indian Institute of Science, Bangalore
E Mail : : vats@biochem.iisc.ernet.in
dr.vathsala2010@gmail.com

Reference Books

1. Biology of the Cell by Alberts B et al., 2008
2. General Biochemistry By Voet and Voet, 4th Edition
3. Molecular Cloning A Laboratory Manual by sambrook and Russell, Third edition,Volume 1
4. Published paper references will be given if needed.

Who Can apply?

Bachelors or Masters in Biological Science/ PHARMA and MS(in Biotech).

Prerequisites :Biology background is required

Course Fee**:** 10,000/-

Schedule**:**

Saturday's: 10 am to 12.00 Noon

32. Smart design methods and processes in Automotive Industry (2+0)

Objectives:

- In depth training on design methods in Automotive industry
- Industry design methods in the area of automotive design viz Chassis, chassis aggregates, Engine, Engine subsystems, BIW.
- In depth view in to manufacturing process such as Casting design, sheet metal design, forgings, other advanced methods such as hydro-forming.
- Overall, this program is designed to enhance the understanding of design processes and methods for young design engineers when they get employed in the Industry.

Syllabus:

1. Introduction to Smart design methods in Automotive Industry.
2. Introduction to Automotive domain processes.
3. Introduction to Manufacturing processes.
4. Automotive Chassis and aggregates design.
5. Automotive power train design.
6. Automotive Body design/BIW

Target Group:

a. Engineering design-George Ellwood Dieter, Linda C. Schmidt-McGraw-Hill
b. Product design: Techniques in reverse engineering and new product development, Kevin Otto, Kristin Wood, Pearson education Inc
c. Internet sources in public domain

Faculty :

Prof. Anindya Deb
Professor,
Dept. of CPDM, IISc.

Email:
adeb@cpdm.iisc.ernet.in,
caedsafe@gmail.com

Faculty :

Mr. Kalyan Kumar K.V
Founder & Director
Abhiyantara Technologies
Bengaluru -94.

Email:
kalyan.kumar@abhiyantara.com
Kalyan.abhiyantara@gmail.com

Reference Books:

1. Engineering design-George Ellwood Dieter, Linda C. Schmidt-McGraw-Hill
2. Product design: Techniques in reverse engineering and new product development, Kevin Otto, Kristin Wood, Pearson education Inc
3. Internet sources in public domain

Who can apply?

B.E. /B.Tech /M.Tech (Mechanical, Automobile and IP)

Course Fee: Rs. 10,000/-

Schedule:
Saturday's: 2.00 pm. to 4 pm.

33. WIRELESS LANS,CONCEPTS,INSTALLATION,TROUBLESHOOTING AND TESTING (2+C)

Objectives:

To Understand the Concepts of wireless LAN, look at the design principle of wireless LAN, test the networks and identify possible security issues in a wireless LAN. The course also trains the participants in testing and Troubleshooting wireless networks using tools such as wireshark and air-crack.

Syllabus:

Concepts and Standards of wireless networks, characteristics and operation of contemporary wireless network technologies such as IEEE 802.11 wireless local area network, operation of the TCP/IP protocol suite in wireless networks, security issues and current solutions for which networks, usage of wireshark for analyzing and monitoring wireless networks, installing configuring and analyzing the wireless networks testing and troubleshooting of wireless networks protocols using wireshark and air-crack.

Faculty :

Mrs. ANANDI GIRIDHARAN
Senior Scientific Officer,
Dept. of ECE, IISc.

Email:
anandi@ece.iisc.ernet.in

Faculty :

Mr. Chetan Kumar S
Manager, Software Development,
Cisco Systems, Bangaluru.

Email:
shivakumar.chetan@gmail.com

Reference Books:

1. Wireless communications and networks-2nd Edition by William Stallings, 2005

2. Installing, Troubleshooting, and Reporting Wireless Networks. Jim Aspinwall, McGraw-Hill/TAB Elecctronics; 1st edition, 2003.

3. Computer Networks- Fourth Edition By Andrew Tanenbaum, 2003

Who can apply?

B.E. /B.Tech /M.Tech (ECE, Electrical, Computer Science, Information Technology)

Course Fee: Rs. 15,000/-

Schedule:

Saturday's: 10.00 a.m. to 12.00 Noon.

LAB:(practical) class will be worked out in consultation with the course participants

34. Software Test Automation (2+0)

Objectives:

Software testing can be complex. To ensure quality and speed and avoid human errors, automation plays an important role. This course is an introduction to automation in testing.

Syllabus:

Quality in software, QA v/s QC manual testing concepts, test planning and Saturdays test automation, automation frame works, automation tools – Selenium, Appium.

Target Group :

IT Industry

Faculty :

Dr. Gopal Krishna Sharma
Fiserv India Pvt. Limited,
Bengaluru

Email : gopalaks@yahoo.com

Faculty :

Prof. Sekhar M
Dept. of Civil Engg.

Email: muddu@civil.iisc.ernet.in

Reference Books:

1. Selenium testing tools cook Book, PACKT, Unmesh Gundecha, 2nd Edition.
2. Selenium testing tools beginners guide, PACKT, David Burns

Who can apply?

B.E. /B.Tech /M.Tech / MCA

Perquisites: Basic Cooling Knowledge

Course Fee: Rs. 10,000/-

Schedule:

Saturday's: 2.00 pm. to 4.00 pm

Appendix ‘A’ PROFORMA

PROVISIONAL CERTIFICATE

NAME OF THE COLLEGE:

This is to certify that Sri / Smt. ……………………………………………was a student of this College studying in …………………………………………… *

Course ………………………………………………......………………………………**

branch during the session ……………… to ……………………………

He / She has successfully completed the course as prescribed by the ……………………………… ……………………………………………………………………………………………………

University with regard to course of study, attendance, sessional requirements etc.

He / She has passed the final ....* examination held during ....securing....................class as per the results announced by the University. He / She will be awarded the .... degree during the next convocation of the University.

College Seal PRINCIPAL

Date:

*Appropriate course to be filled in (B.E., M.E., M.Sc., and M.Com. M.B.B.S., etc)

** Mention Civil, Electrical, Electronics, Chemistry, Biology, etc.

IMPORTANT DATES		
Apply Online CCE Web Site	23rd November 2016 to 26th December 2016	Wednesday Monday
Last Date to apply with Penalty	6th January 2017	Friday
Classes Commence	2nd January 2017	Monday
Final Exams	24th April 2017 29th April 2017	Monday Saturday

CCE-PROFICIENCE PROGRAMME

Officer-in-Charge/Coordinator, CCE-PROFICIENCE,
Central Lecture Hall Complex, Indian Institute of Science, BENGALURU 560 012

Phone: + 91 080 22932055/2508

E-mail:
so@cce.iisc.ernet.in/cce-prof@cce.iisc.ernet.in

URL: www.cce.iisc.ernet.in

Working Hours:
Monday through Friday: 0930 hrs to 1900 hrs
Saturday: 1000 hrs to 1300 hrs