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

INFORMATION HAND BOOK
January - May 2018

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REGULAR COURSES

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2	Advanced French Course (Mon-Wed)	3+0
3	Internal Combustion Engines (Mon-Wed)	3+0
4	Innovative Product Development and Design Methods (Mon)	2+0
5	Project Management (Tue-Thurs)	3+0
6	Data Mining (Tue-Thurs)	3+0
7	Design Thinking and Innovation (Tue)	2+0
8	Analysis and Design of Composite Structures (Tue)	2+0
9	Vibration and Noise Control in Engineering Structures and Systems (Wed)	2+0
10	Linear & Non Linear Programming (Wed-Fri)	3+0
11	Online Course on Linear & Non Linear Programming (Wed-Fri)	3+0
12	Industrial Internet of Things (Thurs)	2+0
13	Deep Learning (Thurs)	2+0
14	Online Course on Deep Learning (Thurs)	2+0
15	Basic Spectroscopy and Instrumentation (Thurs)	2+0
16	Service Design Thinking (Thurs)	2+0
17	Structural Analysis & Design Optimization of Engineering Structures and Systems (Fri)	2+0
18	Embedded System on ARM Platform (Fri)	2+0
19	Microelectromechanical Sensors Technology & Material Characterization Technique (Fri)	2+0
20	Smart Design Methods and Process in Automotive Industry (Sat)	2+0
21	Basics of Data Analytics - Fundamentals (Sat)	2+0
22	Nonlinear Finite Element Method (Sat)	2+0
23	Wireless LANS Concepts, Installation, Troubleshooting and Testing (Sat)	2+C
24	Marketing Management (Sat)	3+0
25	Integrated Circuits, MOSFETs, Op-Amps and their Applications (Sat)	3+0
26	Management of Intellectual Property: Protection, Licensing and Transfer (Sat)	3+0

27	Basics of Data Analytics – ML & NLP (Sat)	2+0
28	Basic Concepts of Finite Element Method (Sat)	2+0
29	Basic French Course (Sat)	2+0
30	Introduction to Industrial Design (Sat)	2+0
31	Principles and Applications in Genetic Engineering (Sat)	2+0
32	Biopharmaceutical Technology and Drug Development (Sat)	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 CCEPROFICIENCE 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 am - 9.00 pm

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 Maximum of Two Courses. 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 Rs. 5000/- per credit (plus GST @ 18% applicable) and registration fee is Rs. 300/- 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 (plus GST @ 18% applicable). 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. 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 Section Officer, 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 Officer-in-Charge, CCE-PROFICIENCE in writing.

VERIFICATION OF CERTIFICATE

Participants must get the original convocation certificate for verification during the first class or whenever the CCE informs, failing which candidate will not be allowed to take up the course anymore.

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

Sl. No.	Course Name	Credit	Faculty	Dept.
	COURSE SCHEDULE FOR JAN-MAY 2018 **REGULAR COURSES**			
1.	Strategic Management (Mon-Wed)	3+0	Dr. Parameshwar P. Iyer	MS
2.	Advanced French Course (Mon-Wed)	3+0	Prof. M S Mohan Kumar & Ms. Namratha Nagaraj	CiE & Part time Lecturer, Mount Carmel College
3.	Internal Combustion Engines (Mon-Wed)	3+0	Dr. R T Naik	ME
4.	Innovative Product Development and Design Methods (Mon)	2+0	Dr. J E Diwakar (Retd.) & Prof. P. Achutha Rao (Retd.)	CPDM & NID R&D Campus
5.	Project Management (Tue-Thurs)	3+0	Dr. Parameshwar P. Iyer	MS
6.	Data Mining (Tue-Thurs)	3+0	Dr. V Susheela Devi	CSA
7.	Design Thinking and Innovation (Tue)	2+0	Dr. J E Diwakar (Retd.) & Prof. P. Achutha Rao (Retd.)	CPDM, NID R&D Campus
8.	Analysis and Design of Composite Structures (Tue)	2+0	Dr. G Narayana Naik	AE
9.	Vibration and Noise Control in Engineering Structures and Systems (Wed)	2+0	Dr. S B Kandagal	AE
10.	Linear & Non Linear Programming – 1 (Wed-Fri)	3+0	Dr. Shyan Srinivasa Garani	EE
11.	Online Course on Linear & Non Linear Programming - 1 (Wed-Fri)	3+0	Dr. Shyan Srinivasa Garani	EE
12.	Industrial Internet of Things (Thurs)	2+0	Dr. Pavan Tallapragada & Mr. Ganesh Shankar	EE & Founder & MD Flux Gen. Engg. Pvt. Ltd.
13.	Deep Learning (Thurs)	2+0	Dr. Sriram Ganapathi	EE
14.	Online Course on Deep Learning (Thurs)	2+0	Dr. Sriram Ganapathi	EE
15.	Basic Spectroscopy and Instrumentation (Thurs)	2+0	Dr. S Sandhya	IPC
16.	Service Design Thinking (Thurs)	2+0	Dr. J E Diwakar, (Retd.) Prof. P. Achutha Rao, (Retd.) & Prof. TVP Chowdry	CPDM, NID R&D Campus & CST
17.	Structural Analysis & Design Optimization of Engineering Structures and Systems (Fri)	2+0	Dr. S B Kandagal	AE

No.	Course		Instructor	Department
18.	Embedded System on ARM Platform (Fri)	2+0	Mr. Haresh Dagale	DESE
19.	Microelectromechanical Sensors Technology & Material Characterization Technique (Fri)	2+0	Dr. Hardik J Pandya	DESE
20.	Smart Design Methods and Process in Automotive Industry (Sat)	2+0	Prof. Anindya Deb & Mr. Kalyan Kumar K V	CPDM & Abhiyantra Technologies
21.	Basics of Data Analytics - Fundamentals (Sat)	2+0	Dr. Gopal Krishna Sharma, Dr. Badarinath Ambati & Prof. M Sekhar	Fiser India Pvt. Ltd., Altair Engineering, & Civil Engg.
22.	Nonlinear Finite Element Method (Sat)	2+0	Prof. P C Pandey (Retd.) IISc.	Distinguished Prof. Gitam Univ.
23.	Wireless LANS Concepts, Installation, Troubleshooting and Testing (Sat)	2+C	Mrs. Anandi Giridharan & Mr. Chetan Kumar	ECE & Juniper Networks
24.	Marketing Management (Sat)	3+0	Prof. R Srinivasan (Emeritus Professor)	MS
25.	Integrated Circuits, MOSFETs, Op-Amps and their Applications (Sat)	3+0	Dr. Hardik J Pandya	DESE
26.	Management of Intellectual Property: Protection, Licensing and Transfer (Sat)	3+0	Dr. Parameshwar P Iyer & Dr. R N Narahari	MS & CeNSE
27.	Basics of Data Analytics – ML & NLP (Sat)	2+0	Dr. Gopal Krishna Sharma, Dr. Badarinath Ambati & Prof. M Sekhar	Fiser India Pvt. Ltd., Altair Engineering, & Civil Engg.
28.	Basic Concepts of Finite Element Method (Sat)	2+0	Prof. P C Pandey (Retd.) IISc.	Distinguished Prof. Gitam Univ.
29.	Basic French Course (Sat)	2+0	Prof. M S Mohan Kumar & Ms. Namratha Nagaraj	CiE & Pert time Lecturer Mount Carmel College
30.	Introduction to Industrial Design (Sat)	2+0	Dr. J E Diwakar, (Retd.) Prof. P. Achutha Rao, (Retd.) & Prof. TVP Chowdry	CPDM, NID R&D Campus & CST
31.	Principles and Applications in Genetic Engineering (Sat)	2+0	Dr. N Ravi Sundaresan	MCB
32.	Biopharmaceutical Technology and Drug Development (Sat)	2+0	Dr. N Ravi Sundaresan	MCB

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+0 credits #   Rs. 15,000/-

4. L Stands with 2+L Credits # Rs. 15,000/-

Credits = Lecture Hours per week

$C Stands for Computer Laboratory

$L Stands for Online Course

1. 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 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 MS.,
IISc., Bengaluru.
Email: piyer@iisc.ac.in

Reference Books

1. Fred R. David,
   Strategic Management: Concepts and Cases,
   Prentice Hall, USA, 2001.

2. G. Johnson and K. Scholes,
   Exploring Corporate Strategy: Text and Cases.
   Prentice Hall India, 1996.

3. R. Das,
   Crafting the Strategy.
   Tata McGraw-Hill, (II Ed), 2000.

Who Can apply?

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

Course Fee: Rs. 15,000/-

Schedule: Monday & Wednesday 6.00 p.m. to 7.30 p.m.

2. Advanced French Course (3+0)

Objectives :

Ability to Comprehend, Write and Speak French – in Complex Manner.

Syllabus :

Conjunctions, Prepositions, Complex Paragraphs – Reading Comprehension.
Oral Comprehension - Advance

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: nam2721@gmail.com

Reference Books

1. Alter Ego 2
    Hachette

2. Hachette, Gaelle Graham
    Complete French – Part 2

3. Random House
    Living Language – Advance

Who can apply?
BE/B.Tech/Post Graduates

Course Fee: Rs. 15,000/-

Schedule: Monday – Wednesday : 6.00 pm.to 7.30 pm

3. Internal Combustion Engines (3+0)

Objectives:

Internal Combustion Engines are rapidly growing with technology for effective utilizations in the automobiles with the fuel efficient engines for the aim of keeping the clean environment from the engine exhaust emissions as per the pollution norms. The objective of this course is to cover the fundamental aspects of IC Engines and share the developments with interested scientists, engineers, students and academicians by enhancing their knowledge towards our clean society.

Syllabus:

Over view on IC engines, engines classifications, basic engine components, thermodynamic cycles, performance tests in engines, pollution formation and measurements in SI and CI engines, duel fuel engines, BHART and EURO vehicles, combustion process in petro-diesel engines, combustion chambers, phenomenon of knock, ignition, spray process, multi point fuel electronic injection system, flame propagation, engine emissions control, alternate fuels and properties, hydrogen engines, supercharging, turbo charging, some aspects of engine electronics, basic engine tests and measurements.

Target Group:

Scientists, Engineers, Faculty and Students from various Engineering colleges, Research Development Organizations, Industries, Research Institutes, Post Graduates, Undergraduates.

Faculty:

Dr. R T Naik
Dept. of M E.,
IISc., Bengaluru
Email: rtnaik.iitd@gmail.com

Reference Books

1. Heywood. J B
   Internal Combustion Engine Fundamentals,
   McGraw-Hill, 1998, New York.

2. Ganeson. V
   Internal Combustion Engine,
   Tata McGRAW Hill, 1999, India.

3. Review papers from SAE/ASME Journals

Who can apply?

Those with B. E./B.Tech/AMIE/MSc (Engg) ME/M.Tech or equivalent in the Mechanical Engineering/Automobile Engineering/ Any Interested people.

Course Fee: Rs. 15,000/-

Schedule: Monday & Wednesday - 6.00 pm to 7.30 pm

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

Objectives:

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, through theory classes, aims to look at these issues and create an awareness of innovative product development process and various design methods to achieve success.

Syllabus:

- o Creativity and Innovation
- o Integrated Product Development
- o Product Design
- o Industrial Design
- o Quality Function Deployment
- o Value Engineering
- o Design to Cost
- o Design for Assembly and Manufacture
- o Design for Service
- o Failure Modes and Effects Analysis
- o TRIZ (Systematic Innovation)- Overview
- o Concept Generation Methods
- o Concept Selection Methods

Target Group:

Practicing Engineers, Managers involved in New Product Development, Design and Development in Industries R&D Organizations etc., Academic Personal in Teaching/Practicing Product Design, Product Engineering, Design and Development and Fresh Engineers interested in Design and Innovation.

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

Faculty:
Prof. P. Achutha Rao (Retd.)
NID R & D Campus.
E Mail: raopanambur@gmail.com

Reference Books:

1. Merle Crawford Antonony Di Benedetto;
   New Products Management, Tata McGraw-Hill Education Pvt., Ltd. 2011.

2. Robert G Coppeer;
   Winning at New Products, Basic Books, 2011.

3. Jonathan M. Cagan, Craig M. Vogel,
   Creating Breakthrough Products: Innovation from Product Planning to Program Approval; FT Press, 2010

4. Karl Ulrich and Steven Eppinger,
   Product Design and Development,
   McGraw-Hill/Irwin; 5 Edition May 2011

Who Can apply?

Graduation in Engineering, Management

Course Fee: Rs. 10,000/-

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

5. Project Management (3+0)

Objectives:

To Impart Knowledge and Skills in the art of Managing Projects Scientifically, so as to fulfill 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; Scheduling 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:

All Scientists, Engineers Managers of R&D, Administrators, Entrepreneurs in Knowledge Based Organisation.

Faculty:

Dr. Parameshwar P Iyer
Dept. of MS.,
IISc., Bengaluru.
Email: piyer@iisc.ac.in

Reference Books

1. Parameshwar P Iyer
   Engineering Project Management: with Cases 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?

B.E/ B.Tech./ PG in any descipline or equivalent

Course Fee: Rs. 15,000/-

Schedule: Tuesday & Thursday- 6.00 p.m. to 7.30 p.m.

6. Data Mining (3+0)

Objectives :

To introduce the fundamental techniques and algorithms of data mining and explore the applications of data mining to web mining, bioinformatics, banking and financial sector.

Syllabus :

Introduction to Data Mining; Data preprocessing, data visualization and explanatory data analysis, data mining techniques like data condensation, feature selection, Principle component analysis; Pattern classification techniques like nearest neighbor classification, decision trees, rule based Systems, neural networks, support vector machines. Association rule mining, Apriority algorithm, FP tree, FP growth algorithm. Data clustering; Issues related to large data sets, Class imbalance problem, anomaly detection; Applications to web mining, bioinformatics, data mining in banking and finance, business intelligence, applications like fraud detection, stock market prediction, risk management.

Target Group:

Academic Institutions, Industries/ IT Companies/Defence Organizations like ISRO, DRDO.

Faculty:
Dr. V Susheela Devi
Dept. of CSA,
IISc., Bengaluru.
E-mail: susheela@csa.iisc.ernet.in

Reference Books

1. V Susheela Devi & M Narasimha Murthy,
Pattern Recognition: An Introduction, Univ. (1st Edition.) Universities Press, 2011.

2. Pang-Ning Tan, Michael Steinbach, Vipin Kumar
Introduction to Data Mining,
Addison- Wesley, 2006.

3. M Narasimha Murty & V. Susheela Devi,
Introduction to Pattern Recognition and Machine Learning, IISc Press and World Scientific, 2015

Who can apply?

Those with B.E. / MCA / MSc (CS)

Course Fee: Rs. 15,000/-

Schedule: Tuesday & Thursday: 6.00 pm to 7.30 pm

7. Design Thinking and Innovation (2+0)

Objectives:

The globalization and technology explosion has thrown new challenges to the most successful organizations. Barriers to competition have fallen precipitously as regulations have eased and markets have become more global. The tools and methods which were useful in the past are not enough to solve complex/wicked problems faced by these organizations due to unpredictability and dynamic global environment. These management tools have actually taken them away from viable competitive positions. A Company's innovation capabilities will determine its future growth potential. Design thinking has been making waves in the business world. This new approach promises to foster potential 21st Century competencies. Design thinking is now known as a creative-problem solving approach designers use to create new values that are different and create positive impact. Design thinking has gained popularity as the **Approach to innovate**. The course will expose the participants, through theory sessions, to the design thinking process and the various proven tools used to achieve innovative, breakthrough solutions to complex problems.

Syllabus:

- Creativity and Innovation
- Design, Design thinking
    - Empathise
    - Define
    - Ideate
    - Prototype
    - Test
    - Design Thinking in New Product/Service Development
    - Design Thinking Tools.

Target Group:

Managers interested in Innovation, Strategy; Practicing Engineers, Managers involved in New Product Development, Design and Development in Industries, R&D Organizations etc., Academic Personal in Teaching/Practicing Product Design, Product Engineering, Design and Development, Innovation, and Fresh Engineers Interested in Design and Innovation.

Faculty:

Dr. J. E. Diwakar (Retd.)
Dept. of CPDM.,
IISc., Bengaluru.
Email: jed@cpdm.iisc.ernet.in

Faculty:

Prof. P. Achutha Rao (Retd.)
NID R & D Campus.
E Mail: raopanambur@gmail.com

Reference Books:

1. Thomas Lockwood,
   Design Thinking: Integrating Innovation, Customer Experience and Brand Value; Allworth Press; 2009.

2. Daniel Ling,
   Complete Design Thinking Guide for Successful Professionals; Create Space Independent Publishing Platform, 2015.

3. Tim Brown,
   Change by Design; Harper Business, 2012.

4. Michael G. Luchs, K. Scott Swan & Abbe Griffin,
   Design Thinking, New Product Development Essential from the PDMA; 2015, Wiley.

Who Can apply?

Graduation in Engineering, Management

Course Fee: Rs. 10,000/-

Schedule: Tuesday's - 600 p.m. to 8.00p.m.

8. 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, etc). Many FEM software packages like are available for analysis & Design. One should first understand the Mechanical behavior of the Composite Structures before using FEM packages. After the completion of this course one can use the FEM software 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: ABD matrices, etc.

Hygrothermal Analysis.

Bending Analysis of Beams.

Analysis of Laminated composite plates: Classical and first order theories, Energy Method, numerical examples.

Buckling analysis of plates.

Design of laminates using Carpet plots & AML plots.

Target Group:

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

Faculty:

Dr. G. Narayana Naik,
Principal Research Scientist,
Dept. of AE.,
IISc., Bangalore- 560 012.
E-mail: gnn@aero.iisc.ernet.in

Reference Books:

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

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

3. Robert M. Jones,
   Mechanics of Composite Materials – Second Edition, McGraw-Hill, Kogakusha, Ltd – year 1999.

Who can apply?

B.E / B.Tech. / AMIE / M.Sc.(Engg.)/ AMAeSI (Engg.) (Mechanical, Aero, Civil, Automobile, Marine Engineering etc.) OR equivalent.

Course Fee: Rs. 10,000/-

Schedule: Tuesday's - 6.00 pm - 8.00 pm

9. 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 to achieve "**EMPOWER INDIA WITH SKILL AND Knowledge".**

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, rotodynamic 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 and Engineering College Instructors. Professionals to pursue Postgraduate Higher Studies

Faculty:

Dr. S B Kandagal
Dept. of AE.,,
IISc., Bengaluru.
E-mail: sbk@aero.iisc.ernet.in

Reference Books:

1. Harris, C.W"
   Shock and Vibration Handbook"
   McGraw Hill, New York, 2012.
2. Ewins, D.J."
   Modal Analysis: Theory and Practice",
   Research Studies Press Ltd, England, 2014.
3. Gillespie, T.D.,
   "Fundamentals of Vehicle Dynamics",
   Society of Automotive Engrs., Inc, 20010.
4. Beranek,L.L,
   "Noise and Vibration Control", Wiley, 2008.

Who can apply?

BE, ME, MSc., AMIE or equivalent

Course Fee: Rs. 10,000/-

Schedule: Wednesday's - 6.00 pm to 8.00 pm

10. Linear and Non-linear Programming - 1 (3+0)

Objectives:

To equip the students with basics in linear and non-linear programming for applications in science and engineering.

Syllabus:

Introduction to Linear Programming, The Simplex Method, Duality and Complementary, Interior-Point methods, Conic Linear Programming,

Target Group:

B E/B.Tech, ME/M.Tech

Faculty:

Prof. Shayan Srinivasa Garani
Dept. of ESE
IISc
Email: shayangs@iisc.ac.in

Reference Books:

1. Linear and Non-linear programming by David Leunberger and Yinyu Ye

2. Lecture notes

Who can apply?

Bachelors in Electrical, Computer Science or Electronics.

Pre-requisites:

Mathematics with Engineering

Course Fee: Rs. 15,000/-

Schedule: Wednesday's & Friday's: 6.00 pm - 7.30 pm

11. Online course on Linear and Non-linear Programming - 1 (3+L)

Objectives:

To equip the students with basics in linear and non-linear programming for applications in science and engineering.

Syllabus:

Introduction to Linear Programming, The Simplex Method, Duality and Complementary, Interior-Point methods, Conic Linear Programming,

Target Group:

B E/B.Tech, ME/M.Tech

Faculty:

Prof. Shayan Srinivasa Garani
Dept. of ESE
IISc
Email: shayangs@iisc.ac.in

Reference Books:

1. Linear and Non-linear programming by David Leunberger and Yinyu Ye

2. Lecture notes

Who can apply?

Bachelors in Electrical, Computer Science or Electronics.

Pre-requisites:

Mathematics with Engineering

Course Fee: Rs. 20,000/-

Schedule: Wednesday's & Friday's: 6.00 pm - 7.30 pm

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

Objectives:

To Introduce the state of art of Industrial IIoT with smart machines that performs 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 networked 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 – Sensors and Actuators - Embedded Systems - Wireless Technology – Industry4.0 - Mobile application platform - Cloud access and control – Packaging – UI/UX of IIoT products -Business models with IIoT products – Design Thinking – Analytics, Machine Learning and AI for IIoT systems – Security in IIoT systems - Case studies of IIoT applications – Launching an IIoT product/service – MVP-Entrepreneurship in IIoT

Target Group:

Working professionals in Embedded, Automation, R&D, Resource Management, Professionals, Smart Cities and Villages developers, Mobile app developers, Business Development Managers, Technical Sales Engineers, Policy makers, Entrepreneurs and Aspiring Entrepreneurs

	Faculty: **Dr. Pavankumar Tallapragada** Assistant Professor Dept. of EE IISc E-mail: pavant@iisc.ac.in		**Faculty:** **Mr. Ganesh Hassan Shankar** Founder & Managing Director of FluxGen Engg.Tech. Pvt. Ltd. Bengaluru. E-mail: 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. (CSE, EEE, ICE, ECE in any branch), ME /M Tech, MCA **Pre-requisites:** Basic Knowledge of Electronics and Programming **Course Fee**: Rs. 10,000/ **Schedule: Thursday's** 6.00 pm - 8.00 pm

13. Deep Learning: Theory and Practice (2+0)

Objectives:

 Introduction to Deep Learning Algorithms for Pattern Recognition of Sensory Signals.

Syllabus:

 Basics of Machine learning, Introduction to Neural Networks, Need for Deep Learning. Various consideration in Learning. Conductional and Recurrent Networks. Applications to text, Speech, Video.

Target Group:

DRDO, ISRO, Samsung, NVidia, Microsoft, IBM, Amazon, Intel, GE.

Faculty:

Dr. Sriram Ganapathy
Asst. Prof.,
Dept. of EE.,
IISc., Bengaluru.
E-mail: sriramg@iisc.ac.in

Reference Books:

1. C Bishop
"Neural Networks" 1995

2. Ian Goodfellaw, Yoshua Bengio & Aaron Caurvila
"Introduction to Deep Learning" 2016.

Who can apply?

Bachelors in Electrical, Computer Science or Electronics.

Pre-requisites:

Some exposure to Linear Algebra or Random Processors will be helpful.

Course Fee: Rs. 10,000/

Schedule: Thursday's 6.00 pm - 8.00 pm

14. Online Course on Deep Learning: Theory and Practice (2+L)

Objectives:

Introduction to Deep Learning Algorithms for Pattern Recognition of Sensory Signals.

Syllabus:

Basics of Machine learning, Introduction to Neural Networks, Need for Deep Learning. Various considerations in Learning. Conductional and Recurrent Networks. Applications to text, Speech, Video.

Target Group:

DRDO, ISRO, Samsung, NVidia, Microsoft, IBM, Amazon, Intel, GE.

Faculty:

Dr. Sriram Ganapathy
Asst. Prof.,
Dept. of EE.,
IISc., Bengaluru.
E-mail: sriramg@iisc.ac.in

Reference Books:

1. C Bishop
   "Neural Networks" 1995

2. Ian Goodfellaw, Yoshua Bengio & Aaron Caurvila
   "Introduction to Deep Learning" 2016.

Who can apply?

Bachelors in Electrical, Computer Science or Electronics.

Pre-requisites:

Some exposure to Linear Algebra or Random Processors will be helpful.

Course Fee: Rs. 15,000/

Schedule: Thursday's 6.00 pm - 8.00 pm

15. Basic Spectroscopy and Instrumentation (2+0)

Objectives:

To Understand the basic Principles and Techniques of various Spectroscopic Instruments and their analysis. This Course Addresses various aspects of Spectroscopic relevant to Academics and Industry.

Syllabus:

Introduction to Separation Techniques, Principle, Instrumentation and Application UV- Visible, Infra-red, Raman and Fluorescence Spectroscopy, HPCL and Mass Spectroscopy and Lab Demonstration of working of each Instruments.

Target Group:

Academic/ Research Institutions and R & D Centres.

Faculty:

Dr. S Sandya
Dept. of IPC.,
IISc.., Bengaluru
Email. sandya@iisc.ac.in

Reference Books:

1. D.L. Pavia, G.M. Lampman and G.S. Kriz, Introduction to Spectroscopy.

2. H.Kaur,
   Spectroscopy.

3. Joseph R. Lakowicz.
   Principles of Fluorescence Spectroscopy*.

4. Muralidhara Rao, AVN Swamy & D Dharaneeswara Reddy,
   Instrumental Methods of Analysis

Who can apply?

B.Tech./M.Sc

Course Fee: Rs. 10,000/-

Schedule: Thursday's - 6.00 pm to 8.00 pm

16. Service Design Thinking (2+0)

Objective

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 through lecture and assignment only.

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: **Dr. J. E. Diwakar** Dept. of CPDM., IISc., Bengaluru. Email: jed@cpdm.iisc.ernet.in	**Faculty:** **Prof. P. Achutha Rao (Retd.)** NID R & D Campus. 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, MSc, MBA & MCA

Course Fee: Rs. 10,000/-

Schedule: Thursday: 6.00 pm. to 8.00 pm

17. 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, 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 and achieve "**EMPOWER INDIA WITH SKILL AND Knowledge".**

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, Constructions 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 AE.,, IISc., Bengaluru 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-McGraw-Hill, Sixth Edison, 20012.

2. Shigley, J.E and Mischke, C.R.,
   "Mechanical Engineering Design"
   Tata-McGraw-Hill, Sixth Edison, 2010

3. Johnson Ray, C."
   Optimum Design of Mechanical Elements",
   Wiley, John & Sons, 2014.

Who can apply?

BE, ME, MSc., AMIE or equivalent

Course Fee: Rs. 10,000/-

Schedule: Friday's - 6.00 pm to 8.00 pm

18. Embedded System on ARM Platform (2+0)

Objectives:

To Design and Prototype Embedded System using ARM Cortex M3/M4 Microcontroller.

Syllabus:

Development Toolchain (Coupiel Linker and Debugger), ARM Cortex Processor Architecture, Peripherals, Standalone Application. Intro to RTOS.

Faculty:

Mr. Haresh Dagale
PRS., Dept. of ESE (CEDT),
IISc.., Bengaluru
Email. haresh@iisc.ac.in

Reference Books:

1. Joseph Yiu
   Definitive Guide to the ARM Cortex M3.

2. John Levine
   Linker & loaders

3. Jonathan Valvano
   Embedded Systems – RTOS for ARM Cortex M3.

Who can apply?

BE or MCA

Pre Requisites : **C** Programming Language

Course Fee: Rs. 10,000/-

Schedule: Friday's - 6.00 pm to 8.00 pm

19. Microelectromechanical Sensors Technology and Material Characterization Techniques (2+0)

Objective

This course is design-oriented course aimed at understanding the microfabrication technology used for fabricating integrated circuits, MEMS-based sensors, and devices. Additionally, the course is focused on understanding various tools used for material characterization which is an inherent process used in most of the sensor fabrication. The course will enable the students to get an idea of how to use the Class 10000 clean room and will give a hands-on experience in using microscope and inspecting several microengineered devices. At the end of the course the students should be able to:

- ➢ Understand the protocol of working in a class 10000 clean room environment.
- ➢ Understand the IT Technology and equipment used in fabrication.
- ➢ Understand wafer cleaning, mask designing, metal deposition, photolithography, wet etching, dry etching, PDMS-silicon bonding, Characterization of fabricated device.
- ➢ Implement process flow for device fabrication.
- ➢ Know the Fabrication process of a microengineered device for use in electronics/biology/medicing.
- ➢ Develop skills to troubleshoot problems in microfabrication.
- ➢ Understanding different material characterization techniques.

Syllabus:

Introduction to microfabricated devices (devices for flow cytometry/sorting, microchips using dielectrophoresis, force measurement with cantilevers, microengineered devices for medical therapeutics, blood pressure sensors, devices for drug delivery, devices for minimally invasive surgery), Microfabrication technology: Introduction to the clean room, Contaminants, Wafer cleaning processes (DI water, RCA, metallic impurities, etc.), Substrate materials, Techniques of metallization: PVD [(Sputtering – DC, RF, and Magnetron), thermal evaporation, e-beam evaporation, PLD0}, Types of masks, Hard and soft Lithography, Wet etching, Dry etching (RIF and DRIE), Design of process flow for device fabrication including microfluidics, Bio-MEMS, Microcantilever, Interdigitated electrodes, Introduction to Material Characterization techniques: Scanning Electron Microscopy, Atomic Force Microscopy, Transmission Electron Microscopy, X-ray Diffraction, Device inspection in Class 10000 clean room (biochips, microheater, microfluidic chips).

Target Group:

Lecturers, Assistant/Associate Professors, (Engineering Colleges) Engineers PSUs, Scientist, Research Staffs.

Faculty:
Dr. Hardik Jeetendra Pandya
Asst. Prof.,
Dept. of ESE, IISc.,
Bangalore,
E-mail: hjpandya@iisc.ac.in

Reference Books:

1. Lecture notes on some topics will be provided by the Instructor.

2. J D Plummer, M D Deal, P G Griffin
   Silicon VLSI Technology, Pearson Education, 2001

3. S M Sze (Ed),
   VLSI Technology, 2nd Edition, McGraw Hill, 1988.

4. S A Champbell,
   The Science and Engineering of Microelectronic Fabrication, Oxford University Press, 2001.

Who Can apply?

B.Tech., M.Sc., (Electronics, Physics, Instrumentation, Electrical Engineering)

Pre-requisites:

Basic Electronics

Course Fee: Rs. 10,000/-

Schedule: Friday's: 6.00 pm to 8.00 pm

20. 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 and processes 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:

➢ Trainee engineers from Automotive OEM R&D centers (Eg. GM, FORD, Mercedes-Benz and others)
➢ Trainee engineers from Engineering Service providers (Eg. TCS, L&T Technologies, Infotech and others)
➢ Final year and Fresh graduates from engineering colleges looking for employment in above companies

Faculty : **Prof. Anindya Deb** Professor, Dept. of CPDM, IISc. Email: adeb@cpdm.iisc.ac.in	**Faculty :** **Mr. Kalyan Kumar K.V** Founder & Director Abhiyantara Technologies Bengaluru -94. Email: kalyan.kumar@abhiyantara.com Kalyan.abhiyantara@gmail.com

Reference Books:	Who can apply?
	B.E. /B.Tech /M.Tech (Mechanical, Automobile and IP)
1 Engineering design-George Ellwood Dieter, Linda C. Schmidt-McGraw-Hill	**Course Fee:** Rs. 10,000/- **Schedule: Saturday's:** 10.00 pm. to 12.00 Noon
2 Product design: Techniques in reverse engineering and new product development, Kevin Otto, Kristin Wood, Pearson education Inc	
3 Internet sources in public domain	

21. Basics of Data Analytics - Fundamentals (2+0)

Objective

To introduce various aspects of Data Science and prepare the students for future education in advanced topics of data science.

Syllabus:

Basics of Probability and Stochastic Processes, Fore Casting, Smoothing Techniques, Bivariate and Multivariate Regression, Non Linear Regression, Univariate Data, Concept of Auto Correlation and Partial Auto Correlation, Box – Jenkins's ARIMA, Introduction to AI, Neural Network, Machine Learning and NLP.

Target Group: IT Industry, Academics Interested in Data Science, Any other Industry dealing with Data Analysis.

	Faculty		**Faculty**		**Faculty**
	Dr. Gopal Krishna Sharma Fiserv India Pvt. Ltd., Bengaluru. Email : gopalaks@yahoo.com		**Dr. Badarinath Ambati** Altair Engineering, Bengaluru. Email : abadarinath@yahoo.com		**Prof. Muddu Sekhar** Dept. of Civil Engineering, IISc., Bengaluru. Email : madhu@civil.iisc.ernet.in

Reference Books:

1. Spyros Makridakis et. al.
   Forecasting Methods and Applications
   Wiley, 2005.

2. Bovas Abraham and Johannas Lodolter
   Statistical Methods for forecasting
   Wiley, 1983.

3. Kishor S. Trivedi
   Probability and Statistics with Reliability,
   Queuing and Computer Science Applications.
   Wiley, 2002

Who Can apply?

Any Engineering Degree with Mathematics

Course Fee: Rs. 10,000/-

Schedule: Saturday's: 10.00 am. to 12.00 Noon

22. 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. Bucklings are included.

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. IISc.)
Distinguished Professor, GITAM University,
 E-mail: profpcpandey@yahoo.com/
pcpandey@civil.iisc.ernet.in

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?

BE/ B.Tech.
(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 – 10 am to 12 noon

23. Wireless LANS Concepts, Installation, Troubleshooting and Testing (2+C)

Objective:

To Understand the Concepts of wireless LAN, look at the design principle of wireless LAN, build a simple 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, 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.

Target Group:

Working Professionals in IOT, Networking and communications, Researchers in the same area.

	Faculty **Ms. Anandi Giridharan** PRS., Dept. of ECE IISc., Bengaluru. Email : anandi.giridharan@gmail.com		**Faculty** **Mr. Chetan Kumar S** AiKaan Systems Email : chetansk@aikaan.io

Reference Books:	

1. William Stallings,
   Wireless Communications and Networks,
   2nd Edition, 2005.
 	
2. Jim Aspinwall,
   Installing, Troubleshooting and Reporting Wireless Netw
   McGraw-Hill/TAB Electronics; 1st Edition, 2003.
 	
3. Andrew S Tanenbaum,
   Computer Networks, 4th Edition, 2003.
	Who Can apply?
	
	BE
	
	Course Fee: Rs. 15,000/-
	
	Schedule: Saturday's: 10.00 am to 1.00 pm

24. Marketing Management (3+0)

Objective

To expose those working in Non-Marketing function to Marketing and also upgrade Marketing skills of those in Marketing.

Syllabus:

Marketing Function, Concept, Relevance, Relationship with other Functions; Marketing Environment; Markets; consumer Behaviour; Market segmentation; Marketing Planning; Marketing Mix; Prodnet Policy; Prodnet Live Cycle; Pricing; Advertising; Marketing Control.

Target Group:

All Industries – Small, Medium and Big; R&D Units; Educational Institutions.

Faculty :

Prof. R Srinivasan (Emeritus Professor)
Dept. of M S., IISc.
Email: sri@iisc.ac.in, sri0192@gmail.com

Reference Books:

1. Marketing Management by

   Philip Kotter, 13th Edition PHI, 2015

2. Case Studies in Marketing – The Indian Context

   R Srinivasan, 7th Edition, Prentice Hall Learning, 2017

Who Can apply?

BE/B.Tech, Preferred Professionals in Marketing, Post Graduate in Management, etc.

Pre-requisites:

Exposure to Marketing likely to be helpful.

Course Fee: Rs. 15,000/-

Schedule: Saturday's: 10.00 am to 1.00 pm

25. Integrated Circuits, MOSFETs, Op-Amps and their Applications (2+C)

Objective

This course is design-oriented course aimed at understanding fabrication, parameters, and specifications of integrated circuits, MOSFETs, Op-Amps as well as their applications in the Analog domain. Below are some of the course outcomes.

- ➢ To understand and analyze the Op-Amps.
- ➢ The ability to understand the IC Technology and equipment used in fabrication.
- ➢ To understand feedback techniques and types of Noise.
- ➢ Ability to design amplifiers using OP-Amps.
- ➢ Ability to analyze and design filters using Op-Amps,
- ➢ To develop the skill to build and troubleshoot Analog circuits

Syllabus:

Introduction to Integrated Circuit Technology, Microtechnology and Fabrication of MOSFETs, Op-Amps, Single-Stage and Two-Stage Amplifiers, Wideband Amplifiers and Comparators, Instrumentation Amplifiers, Filters, MOSFETs, Current Mirrors and Active Loads, Frequency Response and Feedback Techniques for Integrated Circuits, Noise, CMRR of an Op-Amp and Op-Amp Circuits, Analog-to-Digital Converter (ADC) and Digital-to-Analog Converter(DAC) using Op-Amps, Understanding the Datasheet of Op-Amps, Practical Application of Op-Amps, Designing analog circuits.

Target Group:

Lecturers, Assistant/Associate Professors, (Engineering Colleges) Engineers PSUs, Scientist, Project Staffs.

Faculty:

Dr. Hardik Jeetendra Pandya
Asst. Prof.,
Dept. of ESE, IISc.,
Bangalore,
E-mail: hjpandya@iisc.ac.in

Reference Books:
1. Gray, Hurst,Lweis and Meyer
   Analysis and Design of Analog Integrated Circuits,
   John Wiley & Songs, 5th Edition, 2009

2. Horowitz and Hill,
   The Art of Electronics, Cambridge Univ, Press, 1999.

3. Behzad Razavi,
   Design of Analog CMOS Integrated Circuits,
   McGraw-Hill, 2001.

4. Phillip E. Allen and Douglas R. Holberg,
   CMOS Analog Circuit Design,
   Oxford University Press, 2nd Edition, 2002

Who Can apply?

B.Tech., M.Sc., (Electronics, Physics, Instrumentation, Electrical Engineering)

Pre-requisites:

Basic Electronics

Course Fee: Rs. 15,000/-

Schedule: Saturday's: 10.00 am to 1.00 pm

26. Management of Intellectual Property: Protection, Licensing, and Transfer (3+0)

Objectives:

To teach basic concepts and practices in the Management of Intellectual Property (IP). To provide the participants the opportunity to make actual IP decisions, realizing that the rationale for the decisions will be more important than the actual decisions themselves. This course will cover the theory and practice of IP Protection, Technology Licensing, and Technology Transfer.

Syllabus:

Concept of IP Management; The Innovation Life Cycle; From Invention to IP Protection to Innovation; IP in action; Various forms of IP; Patenting an Invention: Novelty, Utility, and Non-obviousness; Implementing IP strategies: management issues; Management of Technology Licensing and Technology Transfer/ Live Cases in IP Management from academia and R&D Organisations.

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 MS.,
IISc., Bengaluru.
Email: piyer@iisc.ac.in

Faculty:

Dr. R N Narahari
CeNSE.,
IISc., Bengaluru.
Email: naraharirn@iisc.ac.inn

Reference Books:

1. Prabuddha Ganguli,
   "Gearing up for Patents – The Indian Scenario",
   University Press (I) Ltd., Hyderabad 1998.

1. Prabuddha R Ganguli
   "IPR – Unleashing the Knowledge Economy",
   Tata McGraw Hill, New Delhi, 2001.

2. Taraporevala, V J
   "Law of Intellectual Property"
   Published by V J Taraporevala, Mumbai. 2005.

Who Can apply?

B.E/ B.Tech./ M.Sc./M.Com./ MBA/ or equivalent

Course Fee: Rs. 15,000/-

Schedule: Saturday's - 1.00 pm. to 4 pm.

27. Basics of Data Analytics – ML & NLP (2+0)

Objective

To introduce basics of Machine Learning Concepts and Natural Language Processing Concepts.

Syllabus:

Revision of Probability theory and Concepts of Linear Algebra.
Machine Learning Basics, Mitchall's Definition, Task, Performance and Experience, Supervised & Unsupervised Learning, Applications of Machine Learning.
Basics of NLP, Linguistic essentials, words & Grammar, Statistical Inference, Hidden Markov Model, Probabilistic Pasing, Sorne Applications.

Target Group: IT Industry, Academics Interested in Data Science, Any other Industry dealing with Data Analysis.

Faculty	**Faculty**	**Faculty**
Dr. Gopal Krishna Sharma Fiserv India Pvt. Ltd., Bengaluru. Email : gopalaks@yahoo.com	**Dr. Badarinath Ambati** Altair Engineering, Bengaluru. Email : abadarinath@yahoo.com	**Prof. Muddu Sekhar** Dept. of Civil Engineering, IISc., Bengaluru. Email : madhu@civil.iisc.ernet.in

Reference Books:

1. Introduction to Machine Learning
   Ethem Alpaydin, MIT Press, 2014

2. Foundations of Statistical Natural Language Processing
   Christopher D Manning and Hinrich Schutze, MIT Press, 2002
3. Probability and Statistics with reliability, queuing
   Kishore S Trivedi, Wiley, 2002

Who Can apply?

Any Engineering Degree with Mathematics

Course Fee: Rs. 10,000/-

Schedule: Saturday's: 2.00 pm. to 4.00 pm

28. 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. IISc.)

Distinguished Professor, GITAM University,
E-mail: profpcpandey@yahoo.com /
pcpandey@civil.iisc.ernet.in

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.all

   Concept and Applications of Finite Element Analysis,

   John Wiley Sons, 2002. (IV Edition)

Who can apply?

BE/ B.Tech.
(Civil/Mechanical/Aerospace), OR equivalent

Course Fee: Rs.10,000/-

Schedule: Saturday's -2.00 pm to 4.00 pm

29. Basic French Course (2+0)

Objectives :

To enable the students to speak, read, write and comprehend the French language.

Syllabus :

Tenses, Adverbs, Prepositions, Adjectives, Oral Exercise listed comprehend, Pronunciation Sentence Construction, dictation, Logical Reasoning of Phrases.

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: nam2721@gmail.com

Reference Books

4. Alter Ego 1-
    Hachette

5. Hachette, Gaelle Graham
    Complete French – Part 1

6. Random House
    Living Language – The Basics

Who can apply?

BE (Any discipline)/Post graduation

Pre-requisites:
Course Fee: Rs. 10,000/-

Schedule: Saturday's 2 pm to 4.00 pm

30. Introduction to Industrial Design (3+0)

Objective

"**Industrial Design"** is one of the youngest professions gaining recognition as a differentiator to survive and grow in the competitive global market. Professional Industrial Designers are in great demand in all sectors of industry today. Graduate and postgraduate courses are offered in India and abroad on Industrial Design and allied Fields.

In this Course, the students are introduced to what industrial designers do, how they contribute to be innovative and create great products. Industrial designers bring new perspectives based on understanding of the users' real needs and the context in which they use the products, and help develop products which meet users' aspirations and contribute for the improvement of quality of life. They follow a proven process to identity opportunities and develop concepts to meet the challenges.

This course serves as an introduction to the world of industrial design and its wide-ranging applications. The students will learn about the history of design, design methodology, product ergonomics, developing successful products through lectures, discussions. The students are expected to do a lot of exercises in the classes and at home to get a good understanding of the topics. Ability in free hand sketching is necessary.

Syllabus:

- Innovation, Creativity, Embedded mindset to creative thinking. Barriers to creativity.
- History of Design.
- Industrial Design – Yesterday, today and tomorrow.
- Design Communication
- Product Design Process / Methodology
- Elements of Design
- Principles of Design
- Materials & Manufacture
- Product ergonomics
- UX
- Design Strategy and Management

Target Group: Practicing Engineers, Architects, Managers Responsible for engineering services, professional in design and development Industries, R & D Organizations etc., Academic Personnel in teaching / practicing product design/service design, product engineering, design and development and fresh engineers interested in Design and Innovation; Start up entrepreneurs

Faculty: **Dr. J. E. Diwakar** Dept. of CPDM., IISc., Bengaluru. Email: jed@cpdm.iisc.ernet.in	**Faculty:** **Prof. P. Achutha Rao (Retd.)** NID R & D Campus. E Mail: raopanambur@gmail.com	**Faculty:** **Prof. TVP Chowdry** Project Scientist CST E mail: tvpchowdry@gmail.com

Reference Books:

1. Scott Hurff
   Designing Products People Love; How Great Designers Create Successful Products, O'Reilly Media, 1 edition, 2016

2. Tom Peters, Design, Essentials (DK Publishing) Paperback

3. Richard Morris, The Fundamentals of Product Design 2nd Edition, Fairchild Books; 2016.

4. Charilotte & Peter Fiell, Industrial Design A-Z, Taschen 201

Who Can apply?

Graduation in Engineering/ Management with a flair for arts and free hand sketching.

Course Fee: Rs. 15,000/-

Schedule: Saturday's: 1.00 pm. to 4.00 pm

31. Principles and Applications in Genetic Engineering (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 – RNA interference – RNAi, Letiviral, retroviral and Adenoviral vectors – Gene therapy – Genetic Engineering of mammalian stem cells, Generation of induced pluripotent stem (iPS) cells, Mitochondrial genome editing – Somatic cell nuclear transfer – Lentiviral and BAC trans genesis – Generation of transgenic and mutant Caenorhabditis elegans – 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; Breeding of germ-line chimeras Cre/lox and Fip/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. Ravi Sundaresan N
Asst. Prof.
Dept. of MCBL.,
IISc., Bengaluru.
Email: rsundaresan@mcbl.iisc.ernet.in,

Reference Books:

1. Sandy B. Primrose, R. Twyman,

   Principles of Gene Manipulation and Genomics

   "Oxford press; 7th Edition.

2. Carl A.
   Transgenic Animal Technology: A Laboratory Handbook. Pinkert Elsevier Science Publishing Co.Inc; 3rd Revised Edition.

3. Marten H. Hofker,
   Transgenic Mouse Methods and Protocols (Methods in Molecular Bioloogy) Jan Van Deursen. Humana Press, 2nd Edition.

Who Can apply?

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

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

Schedule: Saturday's - 9.00 am to 11.00 am

32. Biopharmaceutical Technology and Drug Development (2+0)

Objectives:

This course is for professionals and students interested in understanding the drugs, mechanism and action of drugs, their development and manufacturing process in the pharmaceutical and biotech industry. This course will also focus on the clinical development of new drugs.

Syllabus:

Drug targets – Enzymes, Receptors, Proteins, Nucleic acids, Lipids; Routes of drug administration. Drug solubility – Mechanism of drug action – vitamins, laxatives, analgesics, contraceptives, antibiotics and hormones; Biotransformation – Absorption, metabolism and removal of drugs from body. Pharmacokinetics – zero, First, Second order reactions; Steps in drug Development, Molecular modeling in drug design: Drug manufacturing – tablets, Oral liquids, injectable, vaccines, mAbs and topical applications; Package of drugs, Preservation of drugs; Analytical methods used in drug manufacture; Quality management; Economics and regulatory aspects. Biotechnological tools for drug discovery. Clinical Trials: phase I. phase 2 and phase 3, New Drug Application, Filing, Product Labeling.

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. Ravi Sundaresan N
Asst. Prof.,
Dept. of MCBL,
IISc., Bengaluru.
Email: rsundaresan@mcbl.iisc.ernet.in,

Reference Books:

1. Katzung, B.G.,

   "Basics and Clinical Pharmacology", 9th Edition.

   McGraw – Hill, Inc., New York, 2004.

2. Troy, D.B (Ed).,
   "Remington: The Science and Practice of Pharmacy'",
   21st Edition. Vol I & II.,
   Lippincott Williams & Wilkins., New York 2006

3. Laurence L. Brunton, Bruce A. Chabner, Bjorn C. Knollmann. Goodman & Gilman's The Pharmacological Basis of Therapeutics.

Who Can apply?

B.Tech., B.Pharam., BVSc., BS/M.Sc., M.Pharm., MVSc.,

MS (Biotech), MBBS or Equivalent.

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

Schedule: Saturday's - 11.00 am to 1.00 pm

Appendix 'A' PROFORMA

NAME OF THE COLLEGE

PROVISIONAL CERTIFICATE

This is to certify that Sri/ Smt. ……………………………. was a student of this college studying in ……………………….*
Course ……………………………………………………**
Branch during the Session …………………. to ………………………………...….

He / She have 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
Date: PRINCIPAL

*Appropriate course to be filled in (B.E., M.E., M.Sc., and MCA, MBBS, Etc.)
**Mention Civil, Electrical, Electronics, Chemistry, Biology, Etc.

IMPORTANT DATES

Download application forms from CCE Web Site		24th November 2017	Friday
Receipts of application along with fees (upto)	From To	24th November 2017 26th December 2017	Friday Tuesday
Classes Commence	To	08th January 2018	Monday
Final Exams	From	07th May 2018	Monday
	To	12th May 2018	Saturday

CCE-PROFICIENCE
Coordinator,
Indian Institute of Science,
Bangalore - 560 012

Phone: + 91 080 22932508

E-mail: prof.cce@iisc.ac.in

URL: www.cce.iisc.ac.in/proficience

Working Hours:

Monday through Friday: 09.30 hrs. to 19.00 hrs.

Saturdays': 10.00 hrs. to 16.00 hrs.