

**Pune Vidyarthi Griha's
College of Engineering and Technology, Pune**

Curriculum Book

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| Course Title: SE PRINTING Engineering Mathematics -III | | Course Number: 207004 | |
| Year: SE | | Semester: II | |
| Type of Course | Basic | | |
| Teaching Scheme: 4 Hrs/Week | | Laboratories: 1 Hrs/Week | |
| Course Assessment Method Examples | Direct methods | On-line Examination: 50 Marks | Theory Examination: 50Marks |
| | Indirect Methods | Term-work 25 Marks Tutorials, Assignments, Presentations, MCQs | Practical/Oral Q&A session, Group Discussion |
| Course Prerequisites | A student requires sufficient amount of knowledge of certain topics related to Engineering Mathematics –I & Engineering Mathematics-II, to understand the concepts of Engineering Mathematics-III. | | |
| Course Objectives | Assessment Method Used | | |
| 1 | Provide students with a broad knowledge of the principles of engineering mathematics & its application.. | | |
| 2 | Provide students with the skills necessary to perform in the multidisciplinary environment of the 21 st century | | |
| 3 | Graduates will have a fundamental knowledge needed for the practice or advanced study in various fields | | |
| 4 | Graduates will have a broad education necessary for productive careers. | | |
| 5 | Prepare students to exhibit professional growth throughout their careers. | | |
| Course Outcomes | | | |
| CO1 | Demonstrate wide knowledge in topics like LDE, Transform, Vector Differentiation & Integration & numerical methods. | | |
| CO2 | Demonstrate the ability for understanding the concepts of applications into LDE of higher order. | | |
| CO3 | Demonstrating the physical interpretation of vector differentiation, green`s lemma theorem, Line integral | | |
| CO4 | Demonstrating the ability to apply the studied knowledge to solve real life engineering problems. | | |
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| Course Contents | |
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| Unit-I | <u>LINEAR DIFFERENTIAL EQUATION WITH CONSTANT COEFFICIENTS</u> |
| | Introduction to differential equation of 1 st order , 1 st degree ,explanation about Order and degree of differential equation.Introduction to the concepts of complimentary function and particular integral.Various methods of finding particular integral namely General Method, Variation Parameter, Short Cut Method.Introduction to LDE with constant coefficients, Homogeneous equations,Cauchy`s & Legendre`s DE, Simultaneous & Symmetric Simultaneous DE. |
| Unit-II | <u>FOURIER TRANSFORM</u> |
| | <ul style="list-style-type: none"> ➔ Introduction to Fourier Transform ,understanding of exponential form of Fourier series Fourier integral theorem, meaning of sine and cosine integrals and their inverses. ➔ Introductory to fourier transform ,its meaning standard properties , and their inverses. ➔ Uses of fourier Transform in solving difference equations. |
| Unit-III | <u>LAPLACE TRANSFORM AND APPLICATIONS</u> |
| | <ul style="list-style-type: none"> ➔ Introduction to transform theory ,complex exponential form of Fourier series, Fourier Integral transform, sine & cosine integrals, Fourier transform, Fourier sine & cosine transform & their inverses, application to wave equation, finite transform application to Fourier transform to problems on one & two dimensional heat flow problems. ➔ Laplace transform of standard functions ,properties & theorems ,inverse Laplace transform application of Laplace transforms to solve DE, liquid level systems ,second order systems. |
| Unit-IV | <u>VECTOR DIFFERENTIAL CALCULUS</u> |
| | <ul style="list-style-type: none"> ➔ Physical Interpretation of vector differentiation, Radial ,transverse & Normal componentsOf velocity & acceleration, vector differential operator, Gradient, Divergence & Curl.Directional derivatives Solenoidal, Irrrotational & Conservative fields Scalar Potential ,Vector Identities. |

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| Unit- V | <u>VECTOR INTEGRAL CALCULUS</u> | | |
| | <p>→ Introduction to line, surface ,volume integral & its application to find work done ,Green`s Lemma, Gauss`s Divergence Theorem, Stoke`s Theorem</p> <p>→ Application to problem in electromagnetic fields.</p> | | |
| Unit-VI | <u>APPLICATION OF PARTIAL DIFFERENTIAL EQUATIONS</u> | | |
| | <p>→ Introduction towards basic concepts of partial differential equations ,modeling of vibration string ,heat flow equations ,method of separation of variables</p> <p>→ Problems based on application of PDE to chemical and allied engineering.</p> | | |
| Text Books | Author | Title of Book | Publication & Edition |
| T1 | Erwin Kreyszig | Advanced Engineering Mathematics | Wiley Eastern Ltd |
| T2 | Peter V .O`Neil | Advanced Engineering Mathematics | Thompson Learning |
| Reference Books | | | |
| R1 | P.N.Wartikar | Applied Mathematics (Volumes I& II) | Pune Vidyarthi Griha Prakashan ,Pune |
| R2 | Thomas L.Harman James Dabney & Norman Richert | Advanced Engineering Mathematics with MATLAB | 2eCole, Thomson Learning |
| R3 | M.D.Greenberg | Advanced Engineering Mathematics | Pearson Education2e |
| R4 | B.S.Grewal | Higher Engineering Mathematics | Khanna Publication, Delhi |
| R5 | B.V.Ramana | Higher Engineering Mathematics | Tata McGraw-Hill |
| Self-Learning Material (OCW, Handouts, Web Recourses, Research papers etc.) | | | |
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| Contents beyond Syllabus | Lagrange method(Method of variation of parameter) : To understand the particular integral if short cut method fails ,then use of general method involves laborious integration ,in such cases method of variation of parameter helps to determine complete solution . Lagrange Method is also studied for 3 rd order linear differential Equation. This method may also be extended to higher order linear differential equations. |
| Additional Experiments (If any) | NA |
| Bridging Courses | Before the commencement of regular classes ,respective teachers conducts 20 minutes session on everyday basis for the first 15 days which focuses on class 12 level basic maths,also revision of certain important topics related to Engineering Mathematics- I and Engineering Mathematics-II are covered to understand the concepts of Engineering Mathematics-III. |
| Assignments | |
| Assignment No.1 | Numerical on C.F,P.I ,Shortcut cases Cauchys &Legendres Equation ,Symmetric and simultaneous Equations, Numerical on Fourier transform ,inverse fourier transform . |
| Assignment No.2 | Numerical on Laplace Transform ,inverse laplace transform . Numerical on vector algebra ,gradient ,divergence ,curl & vector identities . |
| Tutorials | 1. Numerical on complimentary function ,particular integral ,short cut methods . |
| | 2.Numerical on cauchys legendres differential equation , symmetric and simultaneous equations. |
| | 3.Numerical on fourier transform ,fourier cosine transform ,fourier sine transform |
| | 4.Numerical on inverse fourier transform ,inverse fourier cosine and inverse fourier sine transform . |
| | 5.Numerical on Laplace Transform |
| | 6.Numerica on Inverse Laplace Transform. |
| | 7.Numerical on vector algebra ,gradient ,divergence ,curl . |
| | 8 Numerical on vector identities . |

Pune Vidyarthi Griha's
College of Engineering and Technology, Pune
Department of PRINTING Engineering

Curriculum Book
S.E. PRINTING (2016 Courses)
Electrical machines and utilization

June 2014

Department of Printing Engineering

Vision

Mission

Semester II

Course Name : Electrical machines and utilization

Course Number: 203153

Teaching scheme

Lectures: 4 Hrs./ week

Practical: 2 Hrs./ week

Examination scheme

Written: 50 Marks

Online: 50 Marks

Term Work: 50 Marks

COURSE OBJECTIVES:-

At the end of this course, a student will be able to

1. Study and differentiate between AC and DC machines and Learn about the purpose of starter, different types of starters and speed control methods for motors, losses and efficiency of motor.
2. Understand the construction & working principle of transformer.
3. Learn special purpose machines and Study and differentiate between stationary and rotating machines.
4. Understand different types of electrical heating, their applications, various laws of illumination, design of lighting scheme and analyze the methods of lighting calculation.
5. Learn drives and components such as switches, relays, contactors used in printing industry.
6. Understand the concept of energy conservation, safety and maintenance in printing industry.

COURSE OUTCOMES:-

At the end of this course, a student will be able to

- A. Get knowledge of working principle of dc motor, generator, induction motor and their types and Draw various characteristics for DC motors, generator and 3 phase induction motors
- B. Demonstrate speed control methods employed for DC motors and 3 phase induction motor. Solve various numerical on power stages in AC and DC machines.
- C. Estimate regulation and efficiency of transformer by direct and indirect methods
- D. Understand various laws of illumination and perform the calculation of lighting load for a given area.
- E. Get knowledge of working principle of electric heating and its applications.
- F. Identify particular electrical machine, electric drives and components for a specific application by studying various characteristics and learn the concept of energy conservation, safety and maintenance in printing industry.

| Course Outcome | Assessment Method | Assessment Type (Direct / Indirect) | Periodicity | Benchmark (%) |
|----------------|--|-------------------------------------|--|---------------|
| A | Short Test | Direct | Twice in sem | 75 |
| B | Brain storming, Assignments | Direct | Twice in sem | 78 |
| C | Laboratory session | Direct | weekly | 80 |
| D | Assignments Objective test Problem solving | Direct | Twice in sem Industrial visit- once in sem | 78 |
| E | Assignments | Direct | once in sem | 70 |
| F | Presentations, Assignments | Direct | once in sem | 72 |

Course Contents:

UNIT I: D.C. Machines

[8 Hrs]

a) D.C. Generator:

Construction & Principle of working, Types of D.C. Generator, EMF Equation

b) D.C. Motors:

Working Principle, Back EMF, Types of motors, Torque Equation,

Characteristics of Motors, Starting & Reversing, Speed Control Methods of Shunt and Series Motors, Necessity of Starters, Two and Three Point Starters, Efficiency & Losses, Applications of motors.

UNIT II: Special Purpose Motors and Single phase Transformer.

[8 Hrs]

a) Special Purpose Motors- Servo Motors, Stepper Motor and Universal Motor (Construction & Applications), Introduction to Synchronous motors

b) Single phase Transformer: Construction and working principle of transformer, Types of Transformer, Transformer Rating, Losses in a transformer and their variation with load. Efficiency and condition for maximum efficiency. Open circuit and short circuit tests for determination of equivalent circuit parameters and determination of voltage regulation and efficiency.

UNIT III: Three Phase Induction Motor

[8 Hrs]

Basic Principle of Operation, Production of Rotating Magnetic Field, Types of Induction Motors, Slip, Current, Power and Torque

Relations, Torque -Slip Characteristics, Relationship Between Rotor Copper Loss, Slip and Rotor Output, Different Types of Starters, Speed Control of Induction Motors, Applications.

SECTION - II

UNIT IV: Illumination

[8Hrs]

Laws of Illumination, Inverse Square law, Lambert's Cosine Law, Requirements of Good Lighting Scheme, Special Purpose Lighting: Street Lighting, Flood Lighting, different sources of

light: mercury lamp, fluorescent lamp, sodium lamp, compact fluorescent lamp, electroluminescent lamp-LEDs

UNIT V: Electrical Heating

[8 Hrs]

Advantages of Electrical Heating, Resistance and Arc Heating, Principal of Induction Heating and Dielectric Heating, Furnaces, Temperature Control of Furnaces. Application of Different Heating Methods

UNIT VI: Special Components, Drives and Safety & Maintenance of Printing Industry

[8 Hrs]

- a) Special Components in Printing Industry Introduction, Various Types of Relays, Contractor, Limit Switches, Proximity Switches, Micro Switches, Solenoids, Photocells, Electric Encoders etc.
- b) Advantages of Electrical Drives, Individual & Group Drive, Selection of motors depending on load characteristics
- c) Energy Conservation and Safety in Printing Industry- Introduction & Necessity for energy conservation , Methods of energy conservation, Application in Printing Industry, Safety & Maintenance of Printing Industry

Term Work

Any 7 Experiments from 1-8 experiments from list below. 1 Compulsory report of industrial visit.

- 1) Speed control of D.C. Shunt Motor by variation of armature voltage and field current.
- 2) Brake test on D.C. Shunt Motor
- 3) Load test on D.C. Series Motor
- 4) Study of special purpose machines.
- 5) O.C. and S.C. test on single phase Transformer
- 6) Load Test on single phase transformer.
- 7) To study of various starters used for Three Phase Induction Motors.
- 8) Load test on Three Phase Induction Motor
- 9) A report on Industrial Visit to any one of place given below where students can observe
a] Various Motors b] Industrial Furnace c] Electrolysis Process

Text Books

- 1) S.K. Battacharya, Electrical Machines TTTI Chandigarh
- 2) Manikandan, Electrical Machines & Drives, Scitech Publications, Chennai
- 3) Ashfaq Husain, Fundamentals of Electrical Engineering, Dhanpat Rai & Co.Ltd.
- 4) H.Pratab, Art & Science of Utilization of Electrical Energy, Dhanpat Rai & Com.
- 5) B. H. Deshmukh, Electrical Technology, Nirali Prakashan.

Reference Books

1. E.O. Taylor, Utilization of Electrical Energy, Orient Longman
2. Theodore Wildi, Electrical Machines, Drives and Power Systems, Fourth Edition, Pearson Education.
3. B. L. Theraja, A. K. Theraja, "A text book of Electrical Technology- Vol II", S. Chand and Company Ltd.

Additions:

1. Contents beyond Syllabus

2. Assignments

- a. Numericals based on dc motor and generator.

- b. Numericals based on power stages of Induction motor.
- c. Short notes on various starters used for Three Phase Induction Motors.
- d. Short note on various types Single Phase Induction Motors

3. Presentations

- a. Types of relays, types of switches used in printing industry.
- a. Contactor, electric encoders, photocells used in printing industry.

4. Extra Experiments

- a. demonstration of different parts of motors.

5. Bridging the gap

- Industrial Visit is arranged to bridge the gap between theoretical knowledge and practical things.
- NPTEL CD

6. Self study contents:-

- Energy Conservation and Safety in Printing Industry
- Special Components in Printing Industry

**Pune Vidyarthi Griha's
College of Engineering and Technology, Pune**

Curriculum Book

Academic Year: 2016-17

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| Course Title: Soft Skill | | Course Number: 208288 | |
| Year: SE | | Semester: II | |
| Type of Course | Professional Core | | |
| Teaching Scheme: Nil | | Laboratories: 2 Hrs/Week | |
| Course Assessment Method Examples | Direct methods | In Semester Examination: Nil | End Semester Examination: Nil |
| | | Term-work-25 Marks | Practical/Oral- Nil |
| | Indirect Methods | Assignments, Presentations | Seminars, Quiz, Q&A session, Brainstorming, Group Discussion |
| Course Prerequisites | Nil | | |
| Course Objectives | Assessment Method Used | | |
| 1 | Know the basic requirements of Self Awareness & self Development. | | |
| 2 | Understand the Importance of communication, types, barriers of communication, and effective communication. | | |
| 3 | Understand various types of etiquettes for Corporate grooming & dressing, Email & telephone etiquettes, etiquettes in social & office setting. | | |
| 4 | Understand various types of interpersonal skills and interpersonal relationship to work in Team work, to understand Team effectiveness and Decision making | | |
| 5 | Understand the various types of Leadership skills. | | |
| 6 | Understand and Develop the time management and stress management skills. | | |
| Course Outcomes | | | |
| CO1 | Apply the SWOT analysis for evaluation of Self Awareness & self Development | | |
| CO2 | Analyze the importance of communication, different types and barriers of communication for effective communication | | |
| CO3 | Apply the various etiquettes for social and Corporate grooming | | |
| CO4 | Analyze the interpersonal skills to develop the interpersonal relationship to work in Team | | |

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| CO5 | Analyze the leadership skills to organize the events. |
| CO6 | Apply the professional approach to solve practical issues and time and stress management |
| Course Contents | |
| Unit-I | Self Awareness & self Development |
| | <p>a) Self Assessment , Self Appraisal, SWOT, Goal setting - Personal & career - Self-Assessment, Self-Awareness, Perceptions and Attitudes, Positive Attitude, Values and Belief Systems, Self-Esteem, Self appraisal, Personal Goal setting,</p> <p>b) Career Planning, Personal success factors, Handling failure, Depression and Habit, relating SWOT analysis & goal setting, prioritization.</p> |
| Unit-II | Communication Skill |
| | <p>a) Importance of communication, types, barriers of communication, effective communication</p> <p>b) Speaking Skills – Public Speaking, Presentation skills, Group discussion- Importance of speaking effectively, speech process, message, audience, speech style, feedback, conversation and oral skills, fluency and self expression, body language phonetics and spoken English, speaking techniques, word stress, correct stress patterns, voice quality, correct tone, types of tones, positive image projection techniques.</p> <p>c) Listening Skills: Law of nature- you have 2 ears and 1 tongue so listen twice and speak once is the best policy, Empathic listening, Avoid selective listening)</p> <p>Group Discussion - characteristics, subject knowledge, oral and leadership skills, team management, strategies and individual contribution and consistency.</p> <p>e) Presentation skills - planning, preparation, organization, delivery.</p> <p>f) Written Skills – Formal & Informal letter writing, Report writing, Resume writing - Sentence structure, sentence coherence, emphasis. Paragraph writing. letter writing skills – form and structure, style and tone. Inquiry letters, Instruction letters, complaint letters, Routine business letters, Sales Letters etc.</p> |
| Unit-III | Corporate / Business Etiquettes |
| | <p>Corporate grooming & dressing, Email & telephone etiquettes, etiquettes in social & office setting- Understand the importance of professional behavior at the work place, Understand and Implement etiquettes in workplace, presenting oneself with finesse and making others comfortable in a business setting. Importance of first impression, Grooming, Wardrobe, Body language, Meeting etiquettes (targeted at young professionals who are just entering business environment) , Introduction to Ethics in engineering and ethical reasoning, rights and responsibilities</p> |
| Unit-IV | Interpersonal relationship |

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| | <p>a) Team work, Team effectiveness, Group discussion, Decision making - Team Communication. Team, Conflict Resolution, Team Goal Setting, Team Motivation Understanding Team Development, Team Problem Solving, Building the team dynamics. Multicultural team activity</p> <p>b) Group Discussion- Preparation for a GD, Introduction and definitions of a GD, Purpose of a GD, Types of GD, Strategies in a GD , Conflict management, Do's and Don'ts in GD</p> | | |
| Unit- V | Leadership skills | | |
| | <p>Leaders' role, responsibilities and skill required - Understanding good Leadership behaviors, Learning the difference between Leadership and Management, Gaining insight into your Patterns, Beliefs and Rules, Defining Qualities and Strengths of leadership, Determining how well you perceive what's going on around you, interpersonal Skills and Communication Skills, Learning about Commitment and How to Move Things Forward, Making Key Decisions, Handling Your and Other People's Stress, Empowering, Motivating and Inspiring Others, Leading by example, effective feedback</p> | | |
| Unit-VI | Other skills | | |
| | <p>a) Time management- The Time management matrix, apply the Pareto Principle (80/20 Rule) to time management issues, to prioritize using decision matrices, to beat the most common time wasters, how to plan ahead, how to handle interruptions , to maximize your personal effectiveness, how to say “no” to time wasters, develop your own individualized plan of action</p> <p>b) Stress management- understanding the stress & its impact, techniques of handling stress</p> <p>c) Problem solving skill, Confidence building Problem solving skill, Confidence building</p> | | |
| Text Books | Author | Title of Book | Publication & Edition |
| T1 | Sanjay Kumar and Pushpa Lata | Communication Skills | Oxford University Press |
| T2 | Krishna Mohan, Meera Banerji | Developing Communication Skill | McMillan India Ltd. |
| T3 | Simon Sweeney | English for Business Communication | Cambridge University Press |
| Reference Books | | | |
| R1 | E. H. McGrath | Basic Managerial Skills for all | Eastern Economy Edition, Prentice hall India. |
| R2 | Barun K. Mitra | Personality Development and Group Discussions | Oxford University Press |
| R3 | Priyadarshi Patnaik | Group Discussions and Interview Skills | Cambridge University Press |
| R4 | Napoleon Hill | Thinks and Grow Rich | Ebury Publishing |

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| R5 | Tony Robbins | Awaken the Giant Within | HarperCollins Publishers |
| Self-Learning Material (OCW, Handouts, Web Resources, Research papers etc.) | NASSCOM-Global Business Foundation Skills: Accenture,Convergys,Dell et.al. Foundation Books : Cambridge University Press | | |
| | Time management from inside out: Julie Morgenstern, Owl Books (NY), ISBN-13 9780805075908 | | |
| | You can win: Shiv Khera, Macmillan, ISBN-139789350591932 | | |
| | The Ace of Soft Skills: Attitude, Communication and Etiquette for Success | | |
| | The new Leaders: Daniel Coleman Sphere Books Ltd , ISBN-139780751533811 | | |
| | The 80/20 Principal: by Richard Koch, Nicholas Brealey Publishing , ISBN-13 9781857883992 | | |
| | 9The Power of Your Subconscious Mind: Dr Joseph Murphy Maanu Graphics , ISBN-13 9789381529560 | | |
| Contents beyond Syllabus | To analyse and control the sources of stress. | | |
| Additional Experiments (If any) | Nil | | |
| Bridging Courses | Nil | | |
| Assignments | Any Eight | | |
| 1 | SWOT analysis | | |
| 2 | Personal & Career Goal setting – Short term & Long term | | |
| 3 | Presentation Skill | | |
| 4 | Letter/Application writing | | |
| 5 | Report writing | | |
| 6 | Listening skills | | |
| 7 | Group discussion | | |
| 8 | Resume writing | | |
| 9 | Public Speaking | | |
| 10 | Stress management | | |
| 11 | Team Activity-- Use of Language laboratory | | |
| Tutorials | NIL | | |
| Presentations | SWOT analysis | | |
| | Problem Solving and Decision making | | |

**Pune Vidyarthi Griha's
College of Engineering and Technology, Pune**

Curriculum Book

Academic Year: 2016-17

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|---|---|---------------------------------------|-------------------------------------|
| Course Title: Introduction to Printing Processes | | Course Number:208281 | |
| Year: SE | | Semester: I | |
| Type of Course | Professional Core | Credit Scheme: Theory: 4 Practical: 1 | |
| Teaching Scheme: 4Hrs/Week | | Laboratories: 2 Hrs/Week | |
| Course Assessment Method Examples | Direct methods | On-line Examination: 50 Marks | Theory Examination: 50 Marks |
| | | Term-work-25 Marks | Practical -50 Marks |
| | Indirect Methods | Assignments, Presentations, MCQs | Quiz, Q&A session, Group Discussion |
| Course Prerequisites | Nil | | |
| Course Objectives | Assessment Method Used | | |
| 1 | To understand the flow of printing | | |
| 2 | To understand details of prepress department | | |
| 3 | To understand details of press department | | |
| 4 | To understand details of post press department | | |
| 5 | To understand the basics of design | | |
| 6 | To learn the types of design for different products | | |
| 7 | To know the specialized printing applications | | |
| Course Outcomes | | | |
| CO207.1 | Analyze the printing workflow to Categories pre press, press and post press techniques | | |
| CO207.2 | Analyze the basic printing processes to make a selection of printing processes for specific job | | |
| CO207.3 | Analyze the various binding & finishing techniques to make printing job more effective | | |
| CO207.4 | Apply the principals of design and fundamentals of design to create a effective design | | |
| CO207.5 | Apply the additive & subtractive theory to create a effective design | | |
| CO207.6 | Identify the specialised printing applications | | |
| Course Contents | | | |
| Unit-I | Pre-Press | | |

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| | Printing Workflow, Typography, 2D & 3D typefaces, family, series of type, legibility readability of type, type measurement, type alignment & arrangement, DTP, Camera Processing, Conversion to film output - negative, positive & tracing, CTP technology, Surface preparation for letterpress, lithography, screen, gravure & flexography |
| Unit-II | Press |
| | Principles of printing, conventional, inkjet and electrophotography printing processes, Configuration of machines, machine parts and accessories, Introduction to non-conventional printing processes – pad printing, dry offset, waterless offset. |
| Unit-III | Post-Press |
| | Binding techniques, Hard Binding, Paperback Binding, Mechanical loose leaf binding, finishing techniques such as Punching, embossing, foiling, lamination, varnishing, spot UV |
| Unit-IV | Basics of Design |
| | Introduction to graphic design, fundamental of design, principle of design, Types of design – natural, conventional, decorative, geometric, and abstract, Basic concepts of designing, Creativity, steps in creativity; Typography; Visual ingredients of graphic design; Design consideration; Symbols and logos. Layout – purpose & advantages; layout styles; layout components; stages in preparing a layout; marking-up; Dummy, Stages of layout, thumbnails, rough layout, comprehensive layout, artwork, Design for magazines, newspaper, catalogues, cartons, commercial stationary, flexible pouches |
| Unit- V | Layout and Color |
| | Stages of layout – thumbnails, rough layout, comprehensive layout, artwork, Design for magazines, newspaper, catalogues, cartons, commercial stationary, flexible pouches Color Definition of color, Light, Electromagnetic spectrum, Additive color theory, subtractive color theory, Colour Fusion, Colour originals for reproduction. reproduction objectives, resolution, bit depth, grey levels, relationship between grey levels and resolution, dimensions of color, color schemes, color symbolism |
| Unit-VI | Specialised Printing Applications |
| | Lenticular Printing, Thermographic printing, Dye sublimation, Large format printing-backlit and front lit, hologram printing, printing with encapsulated (scented) inks, RFID labels, Organ Printing |

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| List of Experiments | Term Work shall consist of following any Eight experiments | | |
| 1 | To prepare screen and cut stencil method and print single and multicolour Job | | |
| 2 | To prepare the screen by direct photographic method. | | |
| 3 | To prepare the screen by indirect photographic method | | |
| 4 | To prepare the screen by Direct-Indirect photographic method | | |
| 5 | To optimize the exposure time of PS plate using UGRA step control wedge | | |
| 6 | To prepare PS plate for offset | | |
| 7 | To prepare flexo plate for flexography printing | | |
| 8 | To take a print on digital printer | | |
| 9 | To take a print on ink jet printer | | |
| 10 | Print process identification from printed samples | | |
| Reference Books | Author | Title of Book | Publication & Edition |
| R1 | J. Michael Adams, Penny Ann Dolin | Printing Technology 5 th edition | Delmar Publishing |
| R2 | Rogue C. Parker | Looking Good in Print - A Guide to Basic Design for Desktop Publishing | 3 rd edition, Ventana Pr. |
| R3 | Alastair Campbell | The Designers Handbook | Little Brown |
| R4 | N. N. Sarkar | Art and Print Production | 2 nd edition, Oxford University Press, India |
| R5 | D. C. Mulvihill | Flexo Primer | Foundation of FTA |
| R4 | H. Kipphan | Handbook of Print Media | Springer-Verlag Berlin Heidelberg |
| Self-Learning Material (OCW, Handouts, Web Recourses, Research papers etc.) | Nil | | |
| Contents beyond | To prepare a color screen printed Diwali Greeting Card | | |

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| Syllabus | |
| Additional Experiments (If any) | Nil |
| Bridging Courses | Nil |
| Assignments | |
| 1 | To prepare the screen by direct and indirect photographic method |
| Tutorials | Nil |
| Presentations | Lamination |

Course Name: Printing Digital Electronics

Course Number: (208283) (Professional Core)

Teaching Scheme

Lectures: 4 Hrs/Week

Practicals: 2 Hrs/Week

Examination Scheme

Theory: 100 Marks

Term work: 25 Marks

Course Objectives:

1. Understand Fundamentals of Digital Electronics
2. Understand Number Systems
3. Understand Logic Families and Circuits
4. Understand Use of Digital Electronics in Printing

Course Outcomes:

| Course Outcome | Assessment Method | Assessment Type (Direct / Indirect) | Periodicity | Benchmark |
|--|--|--|---|------------------|
| Understand Fundamentals of Digital Electronics | Question/Answers Brainstorming | Indirect Indirect | Once/Week Once/Week | ≥ 60 |
| Understand Number Systems | Question/Answers Brainstorming Assignments | Indirect Indirect Direct | Once/Week Once/Week Once/Week | ≥ 60 |
| Understand Logic Families and Circuits | Question/Answers Brainstorming Presentations | Indirect Indirect Direct | Once/Week Once/Semester Once/Semester | ≥ 60 |
| Understand Timing Concept | Question/Answers Observations Assignments | Indirect Direct Direct | Once/Week Once/Semester Once/Week | ≥ 60 |

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| Understand Counters | Question/Answers Brainstorming | Indirect Indirect | Once/Week Once/Week | >=60 |
| Understand Flip-Flops | Question/Answers Brainstorming Observations | Indirect Indirect Direct | Once/Week Once/Week Once/Week | >=60 |
| Understand ADC and DAC | Question/Answers Brainstorming Assignments | Indirect Indirect Direct | Once/Week Once/Week Once/Week | >=60 |
| Understand Digital Memories | Question/Answers Assignments | Indirect Direct | Once/Week Once/Semester | >=60 |
| Understand LED, LCD Concepts | Question/Answers Brainstorming Assignments | Indirect Indirect Direct | Once/Week Once/Week Once/Semester | >=60 |
| Understand Applications in the Field of Printing | Question/Answers | Indirect | Once/Semester | >=60 |
| Understand Automation | Question/Answers | Indirect | Once/Semester | >=60 |
| Work in a team to identify problem, factors affecting the problem etc with help of digital kits. | Assignments | Direct | Once/Week | >=60 |

Course Contents

UNIT - I Introduction of number system

Decimal, Binary, Octal Hexadecimal number systems and their conversions. BCD codes, 8421, Excess - 3, Gray Code, ASCII code. Concept of bar code and its application in printing.

UNIT - II Fundamentals of Digital Electronics

Boolean algebra, De-Morgan theorems, all types of gates and their truth tables. Need of minimization, Minimization techniques, K-map simplification up to 4 variables, SOP and POS forms; don't care conditions, Logic families, and comparative study of TTL, ECL and CMOS.

UNIT - III Combination logic and Arithmetic

Combination logic and Arithmetic such as addition, subtraction, 1's complement and 2's complement method. Binary multiplication and division.

Half adder / Half subtractor, Full Adder / Full Subtractor, BCD adder. One bit digital comparator Concept and Application of ALU.

UNIT - IV Sequential logic circuits and their applications in printing

Study of level clocked S-R,D, JK, M-SJK flip-flops

(Includes logical diagrams, symbol truth - table, waveforms / timing diagrams).

Edge triggered flip flops (includes S-R, D, JK, M-S Jk flip-flops along with logical diagram, symbol truth table, waveforms / timing diagram)

Study of asynchronous and synchronous counters and their applications such as paper counting. Roller speed measurements etc Concept of modulo 'N' counter,

UP/Down counter. Principle operation of Universal shift register

(IC 7495 including all modes of operation - concept only) and its application in printing.

UNIT - V Digital signals and its storage and display

Introduction to ADC's and DAC's (includes classification and specifications in brief),

Classification of Memories, study of RAM, ROM, EPROM, E PROM, NVRAM,

SRAM, DRAM, concept of PLA, PAL and PLD's. Display Devices and decoders 7

segment LED display (includes basic diagrams of Common Anode and Common

Cathode) study of decoder driver IC's such as IC 7447, 7448, LCD display &

Display Drivers IC's such as 7106, 7107.

UNIT - VI Introduction to Digital Computer

Block diagram of digital computer, serial port / parallel port concept, Input devices

such as Keyboard, Mouse, Joystick, Output Devices such as Printers (includes

classification and one application of each), Floppy Disks, CD's concept of Modern,

special accessories such as Digital Camera and Digital Scanner.

Term Work

Term Work shall consist of following Ten experiments;

1. Logic gates – I

a) Verification of truth-tables for fundamentals and derived gates (AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR)

b) NAND and NOR gates as universal gates

2. Logic gates - II

a) Verification of Boolean laws and theorems using logic gates.

b) Verification of SOP and POS form by K-map (up to 4 variables only) using logic gates.

3. Comparative study of TTL and CMOS (Parameter measurement for any simple functional circuit using TTL IC and CMOS IC)

4. Study of code conversions and their applications in printing

a) Binary to gray and gray to binary.

b) Bar code evaluation

5. Arithmetic Circuits

a) Half and Full Adder / Half and Full Subtractor functionality verification.

b) One bit digital comparator.

6. Combinational Circuits

- a) Study of multiplexers and demultiplexers.
- b) Study of Encoders and Decoders.

7. Sequential Circuits

- a) Study of flip-flops SR, D, JK, T, M-SJK for both level and Edge triggered clock.

8. Sequential circuits II

- a) Ripple, Ring & Johnson Counter with application related to printing.
- b) Study of mod N counter using IC 7490, IC 7492, IC7493 with application related to printing.

9. Study of Shift Register IC 749 and its application in printing.

10. Study of ADC & DAC IC (8 bit only) or Study of or Display Devices and Drivers

- a) LED display (one type only)
- b) LCD display (one type only)

Text Books

1. R. P. Jain - Modern Digital Electronics Tata McGraw Hill Publication.
2. Gothman - Digital Electronics - An introduction to theory and practice Prentice Hall Publication.

Reference Books

3. Malvino and Leach Digital Electronics - Principles and applications - Prentice Hall Publication.
4. Tocci Digital systems Principles and application (6th edition) - Prentice Hall Publication.

**Pune Vidyarthi Griha's
College of Engineering and Technology, Pune**

Curriculum Book

| | | | |
|--|---|----------------------------------|---|
| Course Title: Material Science | | Course Number: 208283 | |
| Year: SE | | Semester: I | |
| Type of Course | Professional Core | | |
| Teaching Scheme: 4 Hrs/Week | | Laboratories: 2 Hrs/Week | |
| Course Assessment Method Examples | Direct methods | On-line Examination: 50 Marks | Theory/End Semester Examination: 50 Marks |
| | | Term-work | Practical |
| | Indirect Methods | Assignments, Presentations, MCQs | Seminars, Quiz, Q&A session, Group Discussion |
| Course Prerequisites | Applied Chemistry | | |
| | Applied Physics | | |
| Course Objectives | Assessment Method Used | | |
| 1 | Select appropriate metals and polymers material used in different printing processes | | |
| 2 | Discuss the importance of surface energy and surface tension for the better interaction of substrate and coatings. | | |
| 3 | Distinguish the various types of printing inks and their properties required in different printing processes. | | |
| 4 | Select the various grades of papers used for printing and packaging applications and their properties | | |
| 5 | Classify different packaging materials according to applications. | | |
| 6 | Understand the working concept of various instruments used for testing in printing materials. | | |
| Course Outcomes | | | |
| C205.1 | Apply the knowledge to use of metals and polymers in printing and allied industry. | | |
| C205.2 | Relate the knowledge to select the appropriate consumable for the effective use in printing and converting applications. | | |
| C205.3 | Analyse the characteristics of various raw material used in printing ink and to predict the properties through suitable testing methods of printing ink for runnability, printability and shelf life. | | |

| | |
|------------------------|--|
| C205.4 | Analyse the characteristics of various raw materials used to manufacture paper and its properties for runnability, printability and shelf life. |
| C205.5 | Analyse the various materials used to for manufacture of packaging as per the applications. |
| C205.6 | Explain the various methods and instruments used for material analysis in printing and converting. |
| Course Contents | |
| Unit-I | Metals and Polymers |
| | Metals used as image carriers, Metals used as substrate for various applications. Introduction to polymer, Thermo set & thermoplastic polymer, natural & synthetic polymer, application of polymers in printing industry as printing substrates, image carrier emulsion, types of rollers for various printing applications. |
| Unit-II | Printing Chemicals and Surface Tension |
| | Role of acids, alkalis and other chemicals in various printing process, Types and role of adhesives in printing and packaging, Surface tension, angle of contact, shape of a liquid surface in a capillary tube, determination of surface tension by capillary tube method, bubble pressure method, dynamic surface tension, Surface Tension measurement of liquid by Ring and Plate method |
| Unit-III | Printing Inks, Properties and Testing |
| | Classification & General characteristics of printing inks for various printing processes, Ingredients of printing ink such as pigments, Vehicles, solvents and additives etc. Manufacturing of printing ink, Drying and curing mechanism of printing inks, rheological properties of ink like viscosity, shear, yield, thixotropy, length and tack, Subjective & objective ink testing methods. Various ink problems like Set off, trapping, filling, caking, end use properties of ink |
| Unit-IV | Paper Manufacturing, Properties and Testing |
| | Importance of paper and paper products in printing industry, Paper manufacturing process including Pulping, Bleaching, waste paper utilization and deinking, Stock preparation, Sizing, Different machines used for paper manufacturing, Single wire and Two wire, Pressing, Drying, Calendering, Super calendaring, Embossers etc., Different surface finishes obtained in paper, selection criteria of paper substrate for printing and converting applications Surface and Physical properties of paper such as GSM, thickness, density etc., strength properties of paper such as tensile, tearing, folding strength etc., chemical and optical properties of paper like pH, color, gloss, brightness and opacity, Importance of BIS & TAPPI standards for paper & its relation to printing industry |
| Unit- V | Packaging Materials |
| | Specialty papers for Packaging, Folding board cartons and coated cartons; Types of Corrugated Boards, Applications |
| Unit-VI | Instruments and Methods for Material Analysis |

| | | | |
|------------------------|--|--------------------------------------|-----------------------------------|
| | Working principle of Confocal Laser Scanning Microscopy, Scanning Electron Microscopy and Atomic Force Microscopy, 2-D and 3-D analysis of substrate, measurement of surface energy of paper, surface tension of a liquid ink and interfacial tension between ink and paper. | | |
| Experiments | | | |
| 1 | To identify various types of plastic films | | |
| 2 | To measure the contact angle of liquid ink and surface energy of substrate | | |
| 3 | To measure the surface tension of an ink by ring and plate tensiometer | | |
| 4 | To take a proof of paste ink and study physical properties of an ink | | |
| 5 | To take a proof of liquid ink by bar coater and flexo lab printer | | |
| 6 | To measure the viscosity of paste and liquid ink | | |
| 7 | To study the end use properties of an ink | | |
| 8 | To find GSM and caliper thickness of substrate | | |
| 9 | To find top and bottom side and cross and machine direction of paper | | |
| 10 | To find Cobb value and measure opacity of paper | | |
| 11 | To measure brightness and gloss of substrate | | |
| 12 | To measure smoothness and porosity of substrate | | |
| Text Books | Author | Title of Book | Publication & Edition |
| T1 | | | |
| T2 | | | |
| Reference Books | | | |
| R1 | L.C. Young | Printing Science | Pitman publication |
| R2 | L.C. Young | Materials in Printing Processes | Focal Press publication |
| R3 | Leach and Pierce | Printing Ink Manual | Springer Publication |
| R4 | Dr. Nelson R. Eldred | What Printer Should Know About Ink | GATFPress, Pittsburgh |
| R5 | Lawrence A. Wilson | What Printer Should Know About Paper | GATFPress, Pittsburgh |
| R6 | E.A. Apps | Printing Ink technology | Leonard Hills, London Publication |

| | | | |
|--|---|--|---|
| R7 | A. J. Athaley | Plastics in Packaging | Multi-tech publication |
| R8 | R. Holman | Technology of Printing Inks | All India PIMA Publication |
| R9 | C.H.Williams | Printing Ink Technology | PIRA UK Publication |
| R10 | K.W. Britt | Handbook of Pulp and Paper technology | CBS Publishers |
| R11 | P.J.Hartsuch | Chemistry of Lithography | GATF Publication |
| R12 | D.S. Mathur | Properties of Matter | S. Chand & Co. Ltd. |
| R13 | Dara.S. S | A Textbook of Engineering Chemistry | S. Chand & Company Ltd., New Delhi |
| R14 | B. Sivasankar | Engineering Chemistry | TATA McGraw Hill |
| R15 | Kenneth G. Budinski, Michael K. Budinski | Engineering Materials: Properties and Selection, Ninth Edition | Pearson Publication |
| R16 | P. Kannan and A. Ravi Krishnan | Engineering Chemistry 9 th edition | Sri Krishna Hitech Publishing Company (P) Ltd, Chennai. |
| R17 | Gauri Shankar Misra | Introductory Polymer Chemistry | New Age International |
| Self-Learning Material (OCW, Handouts, Web Recourses, Research papers etc.) | Paperonweb.com | | |
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| | | | |
| Contents beyond Syllabus | Standard procedures to be followed in testing lab | | |
| | Sampling and sampling procedures for testing | | |
| | Standards used in printing material testing | | |
| Additional Experiments (If any) | | | |
| | | | |
| | | | |

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|-------------------------|--|
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| Bridging Courses | |
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| | |
| Assignments | |
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| Tutorials | |
| | |
| | |
| | |
| Presentations | Technical videos on Testing of Materials |
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**Pune Vidyarthi Griha's
College of Engineering and Technology, Pune**

**Curriculum Book
Academic Year 2016-2017**

| | | | |
|--|---|------------------------------|--|
| Course Title: Print Layout and Design | | Course Number: 208284 | |
| Year: SE | | Semester: I | |
| Type of Course | Professional Core | | |
| Laboratories: 2 Hrs/Week | | | |
| Course Assessment Method Examples | Direct methods | Term-work : 50marks | |
| | | | |
| Course Prerequisites | - | | |
| Course Objectives | Assessment Method Used | | |
| 1 | Understand basic tools, commands of page layouting software. | | |
| 2 | To learn application of page layouting software for preparation of pamphlet design. | | |
| 3 | To learn application of page layouting software for designing brochure and learn print layouting for various machine sizes. | | |
| 4 | To learn application of character style, paragrah style in text book layouting. Also learn how to apply numbering, footer, header for text book layout. | | |
| 5 | To learn image editing tools of photo editing software. | | |
| 6 | To learn how to apply different filters, styles of different filter of photo editing software | | |
| 7 | To learn how to convert color image into gray scale image in photo editing software | | |
| 8 | To learn Basic tools, commands of vector based software. | | |
| 9 | To learn application of Basic tools, commands of vector based software to design magazine cover page. | | |
| 10 | To learn application of Basic tools, commands of vector based software to design newspaper advertisement. | | |
| | | | |
| C206.1 : | Understand Basic tools, commands used in page layouting software and its application for layouting. | | |

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|------------------|---|
| C206.2 : | Apply basic concept of page layouting software to create pamphlet design as per printing requirement. |
| C206.3 : | Apply basic concept of page layouting software to design single color brochure for various print machine sizes |
| C206.4 : | To apply knowledge of page layouting software to create text book layout with different imposition styles. |
| C206.5 : | To understand image editing tools of photo editing software. |
| C206.6 : | To create a background for specific design by using filters of photo editing software. |
| C206.7: | To apply knowledge of photo editing software for converting color image into gray scale image. |
| C206.8 : | To create newspaper advertisement using vector based software. |
| C206.9 : | To apply knowledge of vector graphic software to design a magazine cover page. |
| C206.10 : | To Understand Basic tools, commands used in vector graphic software. |
| Practical | |
| | Term Work shall consist of following experiments: |
| | 1. Introduction to page lay-outing software. |
| | 2. Prepare a pamphlet by using lay-outing software in A5 size and create step and repeat in A3 size. |
| | 3. Design a single color brochure using lay-outing software for A4 size and create print layout for offset machine size such as 15 x 20 inches, 18 x 23 inches, 20 x 30 inches etc. |
| | 4. To design a bookwork using lay-outing software and different imposition styles. |
| | 5. Introduction to image editing tools using photo editing software. |
| | 6. Create a background for specific design by using filters from photo editing software. |
| | 7. Convert color image into gray scale image and adjust the highlight, mid tone and shadow areas. |
| | 8. Introduction to vector graphic software. |
| | 9. Design a magazine cover page using vector base software. |
| | 10. Designing of newspaper advertisement using vector based software. |

Course Name: C303 Year of Study:2015-16

| | |
|----------------|--|
| C206.1 | Understand Basic tools, commands used in page layouting software and its application for layouting. |
| C206.2 | Apply basic concept of page layouting software to create pamphlet design as per printing requirement. |
| C206.3 | Apply basic concept of page layouting software to design single color brochure for various print machine sizes |
| C206.4 | To apply knowledge of page layouting software to create text book layout with different imposition styles. |
| C206.5 | To understand image editing tools of photo editing software. |
| C206.6 | To create a background for specific design by using filters of photo editing software. |
| C206.7 | To apply knowledge of photo editing software for converting color image into gray scale image. |
| C206.8 | To create newspaper advertisement using vector based software. |
| C206.9 | To apply knowledge of vector graphic software to design a magazine cover page. |
| C206.10 | To Understand Basic tools, commands used in vector graphic software. |

Table-3.1.1

1.1.2. CO-PO matrices of courses selected in 3.1.1

(six matrices to be mentioned nepersemesterfrom3rdto8thsemester)(05)

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| C206.1 | - | - | - | - | - | 3 | 3 | - | - | 3 | - | - |
| C206.2 | - | - | - | - | - | 3 | 3 | - | - | 3 | - | - |
| C206.3 | - | - | - | - | - | 3 | 3 | - | - | 3 | - | - |
| C206.4 | - | - | - | - | - | 3 | 3 | - | - | 3 | - | - |
| C206.5 | - | - | - | - | - | 3 | 3 | - | - | 3 | - | - |
| C206.6 | - | - | - | - | - | 3 | 3 | - | - | 3 | - | - |
| C206.7 | - | - | - | - | - | 3 | 3 | - | - | 3 | - | - |
| C206.8 | - | - | - | - | - | 3 | 3 | - | - | 3 | - | - |
| C206.9 | - | - | - | - | - | 3 | 3 | - | - | 3 | - | - |
| C206.10 | - | - | - | - | - | 3 | 3 | - | - | 3 | - | - |

Table3.1.2

| Cour | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO1 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|-----|
| C206 | - | - | - | - | - | 3 | 3 | - | - | 3 | - | - |
| | | | | | | | | | | | | |

Table3.1.3*

**Pune Vidyarthi Griha's
College of Engineering and Technology, Pune**

Curriculum Book

Academic Year: 2016-17

| | | | |
|--|---|----------------------------------|-------------------------------------|
| Course Title: Print Production Techniques | | Course Number:208285 | |
| Year: SE | | Semester: II | |
| Type of Course | Professional Core | | |
| Teaching Scheme: | 4Hrs/Week | Laboratories: 2 Hrs/Week | |
| Course Assessment Method Examples | Direct methods | On-line Examination: 50 Marks | Theory Examination: 50 Marks |
| | | Practical-50 Marks | |
| | Indirect Methods | Assignments, Presentations, MCQs | Quiz, Q&A session, Group Discussion |
| Course Prerequisites | Introduction to Printing Processes, Print Layout Design | | |
| Course Objectives | Assessment Method Used | | |
| 1 | To learn and work with various types of Original | | |
| 2 | To prepare Page Lay-outing and processing | | |
| 3 | To do Proofing and Dummy Preparation | | |
| 4 | To understand Halftone techniques | | |
| 5 | To work with Digital Input Systems | | |
| 6 | To work with Densitometry, and use Densitometer | | |
| 7 | To do Costing of Print jobs | | |
| Course Outcomes | | | |
| CO207.1 | Analyze the requirements of typesetting to create a effective design | | |
| CO207.2 | Analyze the requirements of Page layouting standards to create effective design for specific job | | |
| CO207.3 | Apply the various halftone techniques for dot reproduction | | |
| CO207.4 | Analyze the various digital input systems for effective selection of digital devices for specific job | | |
| CO207.5 | To understand the densitometer and its application | | |
| CO207.6 | Apply the production strategy for costing of specific job | | |
| Course Contents | | | |
| Unit-I | Text Composing | | |

| | |
|-----------------|--|
| | Printer's measurement system, Type series, Family, Typographic Parameters, Copy mark-up, Casting off, Copy editing, Proof reading marks. House style, Evolution of Text composing techniques: Electrical & electronic typewriters, Word Processors, Founts -Outline, True type, Open type, Postscript, Early phototypesetters |
| Unit-II | Print Layout Preparation |
| | Basics of page layout, important considerations: margins, bleeds, marks and print aids. Layout for packaging designs, carton and flexible. Proofing systems, dummy preparation, instructions for print production, ISO standards for layout of different printing processes. |
| Unit-III | Image Reproduction |
| | Originals: Analog and Digital Originals, Line & halftone techniques, Basic prepress, Halftone theory, methods of converting continuous tone to Halftone - AM, FM & hybrid screening, Dot reproduction, Color correction in DTP – Tonal Gradation Curve, UCR, GCR,UCA, PDF workflow systems. |
| Unit-IV | Digital Imaging |
| | Study of Digital Input systems: Types of Scanners such as Drum and Flatbed, Dynamic range, Resolution, Storage, File format, Digital Camera CCD, CMOS, Image resolutions, Camera Resolution, Lenses, Focal length, Iris Diaphragm, Aperture, Shutter, Camera Operation, pixel aspect ratio, Output systems; Types of Lasers such as Helium Neon, Argon ion, Violet Laser diodes, Choice and Selection of laser, Principles of typesetters and printers, Modulation. Direct laser modulation, Acousto-optic modulation, Deflection methods, Mechanical deflectors, Holographic deflectors, Solid state deflectors, Polygon Scanning, Facet tracing optics and Scan-end detection mechanism, Speed and resolution of laser typesetters |
| Unit- V | Understanding Densitometry |
| | Types of Densitometers such as Reflection and Transmission density, Print Density, Characteristics curve, Dot Gain/Loss, Dot Compensation curves, Understanding the importance and calculating Print Contrast, Grayness, Hue error and Ink Trapping, Grey Balance, ANSI, DIN standards, Study and analysis of Print, Parameters affecting densitometry curves |
| Unit-VI | Management and Production Planning |

| | | | |
|----------------------------|---|---|---|
| | Relationship between designer, customer and printer; selection and co-ordination of production process; Limitation of printing process, binding, finishing and ancillary processes on design; selection and specification of ink, paper and other materials; production strategy, costing for print production, various parameters of post press considerations | | |
| List of Experiments | Term Work shall consist of following any eight experiments | | |
| 1 | Study various types of Conventional Originals, Digital Originals and Resolution | | |
| 2 | Study the settings of a scanned photograph and editing of the photograph for further processing | | |
| 3 | Prepare a design for offset printing and check for the parameters such as over printing, color separation and cut off | | |
| 4 | Prepare a design and apply UCR, GCR and Tonal gradation curves in image editing software | | |
| 5 | Study working of Densitometer and measure density, dot gain, dot area, contrast and trapping | | |
| 6 | Evaluate AM, FM and FAM halftone dot structures | | |
| 7 | Study control strip elements t | | |
| 8 | Study the spot color applications and spot color separations in different printing software | | |
| 9 | Study ISO printing standards and design a layout according to ISO standards for any one of the printing process | | |
| 10 | Study of Digital Camera operations | | |
| Reference Books | Author | Title of Book | Publication & Edition |
| R1 | H.Kipphan | Handbook of Print Media | Springer Publication |
| R2 | Leo | Manual of Graphic Design | |
| R3 | Eric Chambers | Manual of reproduction for Lithography | |
| R4 | R.W.G. Hunt | The Reproduction of Color | Wiley-IS and Series in Imaging Science and Technology |
| R5 | Phil Green | Understanding Digital Color | 2nd Edition, GATFPRESS |
| R6 | Noemer, Ewad Fred | Handbook of Modern Halftone Photography | Perfect Graphic Arts, Demarset, U.S.A. |

| | | | |
|--|---|----------------------------------|-------------------|
| R7 | David Bergsland | Printing in a Digital World | Delmar Publishers |
| R8 | Frank Cost | Pocket Guide to Digital Printing | Delmar Publishers |
| Self-Learning Material (OCW, Handouts, Web Recourses, Research papers etc.) | Andy Williams (2010). <i>Grey Balance in Color Picture Reproduction</i> . Research Manager Color and Imaging, WAN-IFRA GmbH & Co.KG | | |
| | George Lychock (1996). <i>Explanation of Hue Error and Grayness</i> . X-Rite. | | |
| Contents beyond Syllabus | Use of Digital Camera and its requirement in quality printing | | |
| Additional Experiments (If any) | Nil | | |
| Bridging Courses | Use of Densitometry tool in print optimization for image reproduction | | |
| | Analysis of AM and FM, FAM Screening | | |
| | Use of ANSI and DIN standards for Print optimisation in image reproduction | | |
| Assignments | | | |
| 1 | To prepare a Test chart for quality control | | |
| Tutorials | Nil | | |
| Presentations | Study of Quality control aid | | |

ACADEMIC RECORD FILE

INDEX

| SR. No. | DESCRIPTION | PAGE NO |
|---------|---|---------|
| 1 | Program Educational Objectives | 1 |
| 2 | Program Outcomes | 2 |
| 3 | Course-level CO-PO and CO-PSO Matrix | 3 |
| 4 | Curriculum Book | 4 |
| 5 | Timetable | 5 |
| 6 | University Syllabus | 6 |
| 7 | Teacher's Manual | 7 |
| 8 | Lecture Plan | 8 |
| 9 | Unit wise Objectives | 9 |
| 10 | Resources used | 10 |
| 11 | Innovative Teaching Mechanisms | 11 |
| 12 | Self-learning Facilities | 12 |
| 13 | Contents Beyond Syllabus (Implementation details including Guest lecture organized/Online course for reference etc) | 13 |
| 14 | Remedial Teaching | 14 |
| 15 | Outcome Assessment | |
| a | Quality of internal question papers and assignments (Documents related to mapping of questions with learning levels and peer assessment of questions) | 15 |
| b | Evaluation Process (Documents related to Class Test, Assignments, Quiz, Seminar, Presentation etc) | 16 |
| c | Attainment of COs | 17 |

Guidelines for maintaining Academic Record File:

1. Every teacher (including Ad-hoc and Visiting) should maintain a **separate Academic Record File-one for every semester for each course and each division** (if teaching to more than one division).
2. The file should be preserved with teacher and it should be made available for inspection by competent authority.
3. Academic Coordinator of the department and HOD should **check** all the sections in a file **on or before 5th day of every month** and also at the end of each semester.
4. Time-table revisions, if any should be entered in Time Table section.
5. **Every teacher should prepare Teacher's Manual in case it is not available from SPPU, Pune.**
6. Lecture Plan entries should be preferably done at the beginning of each Unit's teaching while entries in Topics covered column should be done soon after delivery of a lecture.
7. Resources used section should contain record of OCW, additional references and effective teaching tools like PPTS, URLs etc
8. **Innovative teaching mechanisms section should contain the details regarding use of ICT for delivery of course material, web-based assignments, web-based assessment etc.**
9. Outcome Assessment section should contain **mapping of learning levels and peer assessment, of internal question papers (class test, assignments, MCQs etc)**, Examination records, question papers (internal and external), model answers, sample answer-books and assignments (Best, Average and marginally passed).
10. Outcome assessment section should also contain result analysis of all examinations (conducted by SPPU and internal).
11. Remedial Teaching section should contain records of extra-classes conducted, additional assignments given to students and assessment remarks.
12. Student's attendance record shall be in the form of **signatures of students attending the class and web-based record. The record should be verified by the department Academic Coordinator on or before 5th day of every month.**
13. Page numbers, if required, can be given as (Section-1: 1.1, 1.2...), (Section 2: 2.1, 2.2,...) and so on.
14. If a teacher leaves the institute, all previous Academic Record Files should be handed over to Head of the Department.

ACADEMIC RECORD FILE INDEX

| SR. No. | DESCRIPTION | PAGE NO |
|------------|--|------------|
| 1 | Program Educational Objectives | |
| 2 | Program Outcomes and Program Specific Outcomes | |
| 3 | Course-level CO-PO and CO-PSO Matrix | |
| 4 | Curriculum Book | |
| 5 | Timetable | |
| 6 | University Syllabus | |
| 7 | Teacher's Manual | |
| 8 | Lecture Plan | |
| 9 | Unit wise Objectives | |
| 10 | Resources used | |
| 11 | Innovative Teaching Mechanisms | |
| 12 | Self-learning Facilities | |
| 13 | Contents Beyond Syllabus (Implementation details including Guest lecture organized/Online course for reference etc) | |
| 14 | Remedial Teaching | |
| 15 | Outcome Assessment | |
| a | Quality of internal question papers and assignments (Documents related to mapping of questions with learning levels and peer assessment of questions) | |
| b | Evaluation Process (Documents related to Class Test, Assignments, Quiz, Seminar, Presentation etc) | |
| c | Attainment of COs | |
| 16 | Student's Attendance Record | |

PROGRAM EDUCATIONAL OBJECTIVES

PEO 1:

The printing engineering graduates in their chosen field of prepress, color and design, print, converting shall be adaptive to the dynamic changes happening in the related industry.

PEO 2:

The printing engineering graduates either in their employment or business shall try to implement integrated business processes keeping a strong focus on customer satisfaction.

PEO 3:

The printing engineering graduate shall focus on green printing that includes saving in energy and resources in print processes by way of carbon footprint reduction initiatives.

PEO 4:

To prepare print graduate to undertake higher studies so as to become 'enablers' in researching new upcoming fields of printing and packaging

PEO 5:

The printing engineering graduate shall be able to develop new systems for minimizing costs, wastage and increase productivity in the field of commercial printing, publications, packaging and allied media.

PROGRAM OUTCOMES

1. The graduate shall be able to apply the engineering knowledge that includes fundamental physics, chemistry and mathematics for problem solving in printing engineering.
2. The graduate shall be able to identify and formulate research problems in the field of printing and packaging by reviewing literature and solving it using basic principles of mathematics, statistics and sciences.
3. The graduate shall be able to solve challenges related to health, environment and safety in printing and packaging field realizing their responsibility to society.
4. The graduate shall be able to investigate problems in the field of printing and materials by implementing research methods such as design of experiments and analytical tools to interpret the data.
5. The graduate shall try to develop solutions to solve complex problems in the field of ink, substrate, printing and packaging processes.
6. The graduate shall be able to evaluate and solve issues related to quality of any printed product conforming to industry requirements and standards of both national and international.
7. The graduate shall demonstrate knowledge in areas of designing and prepress areas for the purpose of error-free solutions during printing.
8. The graduate shall effectively carry out calibration, operation and maintenance of machines and equipments used in printing and packaging industry.
9. The graduate shall understand working of mechanical, electrical and electronic components used in various printing and packaging machines and equipments.
10. The graduate shall demonstrate managerial skills, individual skills and team spirit in operations carried out in printing, packaging and converting industry.
11. The graduate shall be able to evaluate critically the implications of wrong practices that cause serious environmental problems and develop products that lead to greater sustainability.
12. The graduate shall follow ethics in his/her professional and research field and thus remain committed to the responsibilities of an engineer.

PROGRAM SPECIFIC OUTCOMES

PSO1: Establish sound theoretical knowledge with expertise and skill in pre-press, press, post press of various printing processes and packaging.

PSO2: Utilization of analysis tools for problem solving and investigation of quality in printing and packaging.

COURSE-LEVEL CO-PO AND CO-PSO MATRIX

Course Outcomes of Course Name (C207):

C207.1 Learn basic structure of book and book making techniques

C207.2 Understand methods of book planning

C207.3 Understand various methods of book production and folding, gathering and collating operations

C207.4 Understand different materials in and adhesives in book production

C207.5 Understand various ancillary operations carried out in finishing techniques

C207.6 Understand costing and estimation in book production

CO-PO Matrix

Note: Enter correlation levels 1, 2 or 3 as defined below:

1: Slight (Low)

2: Moderate (Medium)

3: Substantial (High)

If there is no correlation, put "-"

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| C207.1 | 0 | 1 | 2 | 0 | 2 | 1 | 0 | 0 | 0 | 3 | 3 | 1 |
| C207.2 | 1 | 1 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 2 | 1 | 2 |
| C207.3 | 0 | 1 | 0 | 1 | 3 | 2 | 0 | 0 | 0 | 2 | 1 | 1 |
| C207.4 | 3 | 0 | 3 | 0 | | 1 | 0 | 0 | 0 | 2 | 2 | 2 |
| C207.5 | 1 | 1 | 1 | 0 | 0 | 2 | 1 | 1 | 1 | 2 | 1 | 1 |
| C207.6 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |

CO-PSO Matrix

1: Slight (Low)

2: Moderate (Medium)

3: Substantial (High)

If there is no correlation, put "-"

| CO | PSO1 | PSO2 |
|--------|------|------|
| C207.1 | 1 | 1 |
| C207.2 | 1 | 1 |
| C207.3 | 1 | 1 |
| C207.4 | 1 | 1 |
| C207.5 | 1 | 1 |
| C207.6 | 1 | 1 |

CURRICULUM BOOK

Curriculum Book (Published on website for students)

| | | | |
|---|--|---------------------------------|--|
| Course Title: Finishing Techniques | | Course Number: 208287 | Course Code: |
| Year: SE Printing | | Semester: 2 | |
| Designation of Course | | Professional Core | |
| Teaching Scheme: 4 Hrs/Week | | Tutorial: NIL | |
| Course Assessment Methods | Direct methods | On-line Examination: 50Marks | End Semester Examination: 50 Marks |
| | Indirect Methods | Assignments | Practical/ Term Work Q&A session, Class Test |
| Prerequisites | Introduction to Printing Processes | | |
| Course Objectives | | | |
| 1 | Learn basic structure of book and book making techniques | | |
| 2 | Understand methods of book planning | | |
| 3 | Understand various methods of book production and folding, gathering and collating operations | | |
| 4 | Understand different materials in and adhesives in book production | | |
| 5 | Understand various ancillary operations carried out in finishing techniques | | |
| 6 | Understand costing and estimation in book production | | |
| Course Outcomes | | | |
| C207.1 | Identify the different parts of a book and know various hand binding techniques | | |
| C207.2 | Demonstrate various imposition schemes for different book binding styles | | |
| C207.3 | Evaluate different machine folding mechanisms and their utilizations in terms of applications and its use for book production methods and equipment | | |
| C207.4 | Identify and understand the purpose of various materials such as adhesives, securing threads, reinforcing and lining materials used in the binding process | | |
| C207.5 | Understand properties and functions of surface finishing techniques required | | |

| | |
|------------------------|--|
| | for book production and identify other ancillary operations |
| C207.6 | Calculate book sizes and material requirements for a book including other processing charges during book making |
| Course Contents | |
| Unit-I | Book Binding Techniques [8 Hrs.] |
| | Anatomy of a book and terminology in use, Introduction to various binding techniques, Industrial binding techniques - Adhesive/Perfect Binding, Hardcover binding, Wire stitching, Office stationery binding techniques - Loose leaf binding, spiral, ring, comb binding etc., Legacy hand binding methods - Quarter bound, half bound, full bound, cover drawing, Stitching schemes such as french, kettle, Adhesive binding process - spine preparation, adhesive application, creasing, nipping, Hardcover binding process - case making, book block making, casing in, finishing |
| | Practical/Tutorial |
| | To prepare saddle and side stitched booklet |
| Unit-II | Book Binding Planning [8 Hrs.] |
| | Imposition schemes for various signature schemes - saddle stitch, perfect bound, various folding schemes, Imposition schemes for odd signatures, insertions and wrap around signatures, Book cover planning for soft cover and hard cover case, 2-up imposition schemes, come and go imposition scheme |
| | Practical/Tutorial |
| | To prepare folded signatures using right angle folds - Folding - standard folding schemes up to 16 pages |
| Unit-III | Book Production Methods and Equipment [8 Hrs.] |
| | Folding - folding schemes and mechanisms (buckle folding, knife folding), equipment configurations - All Buckle folding, combination folding machines, terminology in use, (KTL, KLL etc.), Gathering - automated gathering process, signature inspections systems, collating marks, Sewing process and sewing equipment mechanisms, Perfect binding process and |

| | |
|----------------|---|
| | inline/offline perfect binding operations, Gluing off for book blocks and case making process, hardcover book manufacturing, Three knife trimming, Troubleshooting of book binding |
| | Practical/Tutorial |
| | To prepare half bound book - Cut flush - French stitch To prepare quarter bound book - ASTI - Kettle stitch To prepare Half bound book - Kettle stitch To prepare Full bound book - French stitch |
| Unit-IV | Materials Used in Print Finishing [8 Hrs.] |
| | Adhesives - Hot melt adhesives, animal (protein) glues, water based adhesives, PUR hot-melts, Application of adhesives in various print finishing processes - lamination, sealing, tipping, gluing off of spine, side glue application, case making, casing in, Securing materials - threads, wire, Reinforcing and lining materials - mull, kraft, gauze, covering materials - printed and laminated materials, rexin, leather etc., Material testing and QC procedures for book binding materials |
| | Practical/Tutorial |
| | To prepare Full bound book with kettle sewing and decorate it using finishing Techniques |
| Unit- V | Ancillary Processes and Surface Finishing Techniques [8 Hrs.] |
| | Surface finishing techniques - lamination, over print varnishes (OPV), aqueous varnishes, UV varnishes, hot/cold foil stamping, embossing/debossing, Utility operations - Ruling, index cutting, numbering, punching, perforating, corner cutting, tag stringing, calendar rimming, eye-letting, die punching, velvet printing, etc., Post-press material flow and inventory management processes |
| | Practical/Tutorial |

| | | | |
|---|--|---|--|
| | Perform perforation and surface finishing operation on a book | | |
| Unit-VI | Costing and Estimation for Print Finishing [8 Hrs.] | | |
| | Units and measurements - grammage (gsm), bulk, thickness, estimating book sizes and thickness, estimating material consumption of book binding materials, Estimation for finished job including paper, other raw material, processing charges etc. | | |
| | Practical/Tutorial | | |
| | | | |
| Text Books | Author | Title of Book | Publication |
| T1 | A. G. Martin | Finishing process in Printing | Focal Press, London |
| T2 | B. D. Mendiratta | Binding & Finishing | Printek Publication, New Delhi |
| Reference Books | | | |
| R1 | A. G. Martin | Finishing process in Printing | Focal Press, London |
| R2 | B. D. Mendiratta | Binding & Finishing | Printek Publication, New Delhi |
| R3 | Hassy Whetton | Practical Printing & Binding | Ohams Press Ltd. London |
| R4 | ANGELA SUTTON | Bookbinding in Pictures, A beginner's guide to book binding | International Paper Company, U.S.A |
| R5 | Prof. Dr.-Ing. habil. Helmut Kipphan | Handbook of Print Media | Springer-Verlag Berlin Heidelberg GATFP Press |
| Self-Learning Facilities, Web Resources, Research papers for reference | printingbasicscience.pdf. Bookbinding in Pictures_A beginner's guide to bookbinding.pdf | | |
| Contents beyond Syllabus | Metallic Foils used for Foil decoration, Embossing | | |
| Additional Experiments | NIL | | |
| Bridging Courses | Press Visit to Akruiti Press to understand automation in Binding Techniques | | |
| Tutorials | Assignments | | |
| Presentations | NIL | | |

TIME TABLE

TIME TABLE

AY: 2016-17 Class: FE / SE / TE / BE / ME

Division: I / II

w.e.f.: _____

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|-----|---|---|---|---|---|---|---|---|---|
| MON | | | | | | | | | |
| TUE | | | | | | | | | |
| WED | | | | | | | | | |
| THR | | | | | | | | | |
| FRI | | | | | | | | | |
| SAT | | | | | | | | | |

Lectures: _____ Hrs/Week

Practical: _____ Hrs/Week

Tutorial: _____ Hrs/Week

Total Load: _____ Hrs/Week

UNIVERSITY SYLLABUS

PVG'S COET, Pune-9

TEACHER'S MANUAL

PVG'S COET, Pune-9

LECTURE PLAN

Academic Year: 2016-17 Term I

Class: _____

Div: _____

Course: _____ Name of Faculty: _____

| Lecture Number | Lecture Contents Planned | Date | Lecture Contents Delivered | Outcome Assessment planned (if any) |
|----------------|---|------|----------------------------|-------------------------------------|
| L1 | Anatomy of a book and terminology in use | | | |
| L2 | Introduction to various binding techniques | | | |
| L3 | Industrial binding techniques - Adhesive/Perfect Binding | | | |
| L4 | Hardcover binding, Wire stitching | | | |
| L5 | Office stationery binding techniques - Loose leaf binding, spiral, ring, comb binding etc | | | |
| L6 | Legacy hand binding methods - Quarter bound, half bound, full bound, cover drawing | | | |
| L7 | Stitching schemes such as french, kettle | | | |
| L8 | Adhesive binding process - spine preparation, adhesive application, creasing, nipping | | | |
| L9 | Imposition schemes for various signature schemes - saddle stitch | | | |
| L10 | Imposition schemes for various signature schemes- perfect bound | | | |
| L11 | Imposition schemes for odd signatures | | | |
| L12 | Imposition schemes for odd signatures - insertions and wrap around signatures | | | |
| L13 | Book cover planning for soft cover | | | |
| L14 | Book cover planning for hard cover case | | | |
| L15 | 2-up imposition schemes | | | |
| L16 | Come and go imposition scheme | | | |
| L17 | Folding - folding schemes and mechanisms (buckle folding, knife folding), | | | |
| L18 | Folding -equipment configurations - All Buckle folding, combination folding machines | | | |

Signatures: Faculty: _____ Academic Coordinator: _____ HOD: _____

Dates: __/__/__ __/__/__ __/__/__

LECTURE PLAN

Academic Year: 2016-17 Term I

Class: _____

Div: _____

Course: _____ Name of Faculty: _____

| Lecture Number | Lecture Contents Planned | Date | Lecture Contents Delivered | Outcome Assessment planned (if any) |
|----------------|--|------|----------------------------|-------------------------------------|
| L19 | terminology in use, (KTL, KLL etc.) | | | |
| L20 | Gathering - automated gathering process | | | |
| L21 | Signature inspections systems, collating marks | | | |
| L22 | Sewing process and sewing equipment mechanisms | | | |
| L23 | Perfect binding process and inline/offline perfect binding operations | | | |
| L24 | Gluing off for book blocks and case making process, Three knife trimming | | | |
| L25 | Adhesives - Hot melt adhesives, animal (protein) glues | | | |
| L26 | Water based adhesives, PUR hot-melts | | | |
| L27 | Application of adhesives in various print finishing processes - lamination | | | |
| L28 | Application of adhesives in various print finishing processes - sealing, tipping, gluing off of spine, side glue application | | | |
| L29 | Application of adhesives in various print finishing processes -case making, casing in | | | |
| L30 | Securing materials - threads, wire | | | |
| L31 | Reinforcing and lining materials - mull, kraft, gauze | | | |
| L32 | Covering materials - printed and laminated materials, rexin, leather | | | |
| L33 | Surface finishing techniques - lamination | | | |
| L34 | Over print varnishes (OPV), aqueous varnishes | | | |

UNIT WISE OBJECTIVES

PVG'S COET, Pune-9

RESOURCES USED

- 1 **Helmut Kipphan (Ed.), Handbook of Print Media Technologies and Production Methods, Springer-Verlag, 1st Edition, 2001**
- 2 **printingbasicscience.pdf.**

INNOVATIVE TEACHING MECHANISMS

PVG'S COET, Pune-9

SELF-LEARNING FACILITIES

PVG'S COET, Pune-9

Contents beyond Syllabus

**(Implementation details including Guest lecture
organized/Online course for reference etc)**

Press Visit arranged to Akruiti Printers to understand Binding Automation

REMEDIAL TEACHING

PVG'S COET, Pune-9

OUTCOME ASSESSMENT

**15.a Quality of internal question papers and assignments
(Documents related to mapping of questions with learning levels
and peer assessment of questions)**

Quality of internal semester Question papers, Assignments and Evaluation

(Mention the initiatives, implementation details and analysis of learning levels related to quality of semester question papers, assignments and evaluation)

Enter correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

It there is no correlation, put “-”

For SE, please ignore mapping of learning levels through On-line Examination conducted by SPPU.

| Academic Year: 2016-17 | | | | | | | |
|------------------------|-----------------------------|------------------------------------|---------------|-------------|----------|-----------|------------|
| | | Learning Levels (Bloom's Taxonomy) | | | | | |
| | Assessment methods Used | Knowledge | Comprehension | Application | Analysis | Synthesis | Evaluation |
| Cxxx | Course Title | | | | | | |
| External (SPPU) | In-semester Online 1 | 2 | 3 | 2 | 2 | 1 | 1 |
| | Online 2 | 2 | 3 | 2 | 2 | 1 | 1 |
| | End Semester | | | | | | |
| | Practical Exam questions | | | | | | |
| Internal | Test | | | | | | |
| | Assignment | 2 | 2 | - | 2 | - | - |
| | MCQ | | | | | | |
| | Seminar/ Presentation | | | | | | |
| | If any other please Specify | | | | | | |

OUTCOME ASSESSMENT

**15.b Evaluation Process (Documents related to Class Test,
Assignments, Quiz, Seminar, Presentation etc)**

OUTCOME ASSESSMENT

15.c Attainment of COs

STUDENT'S ATTENDANCE RECORD

Course Name: Microprocessor and Microcontroller Tech in Printing

Course Number: (208290) (Professional Core)

Teaching Scheme

Lectures: 4 Hrs/Week

Practicals: 2 Hrs/Week

Examination Scheme

Theory: 100 Marks

Term work: 25 Marks

Oral: 25 Marks

Course Objectives:

1. Understand Fundamentals of Microprocessor 8085
2. Understand Interfacing with 8085
3. Understand Fundamentals of Microcontroller 8051
4. Understand Applications in The Field of Printing

Course Outcomes:

| Course Outcome | Assessment Method | Assessment Type (Direct / Indirect) | Periodicity | Benchmark |
|--|--|--|---|------------------|
| Understand Fundamentals of microprocessor 8085 | Question/Answers Brainstorming | Indirect Indirect | Once/Week Once/Week | ≥ 60 |
| Understand instruction set of 8085 | Question/Answers Brainstorming Assignments | Indirect Indirect Direct | Once/Week Once/Week Once/Week | ≥ 60 |
| Understand timing diagram concepts | Question/Answers Brainstorming Presentations | Indirect Indirect Direct | Once/Week Once/Semester Once/Semester | ≥ 60 |
| Understand interfacing concepts | Question/Answers Observations Assignments | Indirect Direct Direct | Once/Week Once/Semester Once/Week | ≥ 60 |

| | | | | |
|--|---|--------------------------------|-------------------------------------|------|
| Understand different interfacing ICs | Question/Answers Brainstorming | Indirect Indirect | Once/Week Once/Week | >=60 |
| Understand microcontroller 8051 concepts | Question/Answers Brainstorming Observations | Indirect Indirect Direct | Once/Week Once/Week Once/Week | >=60 |
| Understand memory structure of microcontroller 8051 | Question/Answers Brainstorming Assignments | Indirect Indirect Direct | Once/Week Once/Week Once/Week | >=60 |
| Understand instructions set of microcontroller 8051 | Question/Answers Assignments | Indirect Direct | Once/Week Once/Semester | >=60 |
| Understand Applications in the Field of Printing | Question/Answers | Indirect | Once/Semester | >=60 |
| Understand Automation | Question/Answers | Indirect | Once/Semester | >=60 |
| Work in a team to identify problem, factors affecting the problem etc with help of simulator software. | Assignments | Direct | Once/Week | >=60 |
| Work in a team to understand Interfacing with the Help of Interfacing Kits | Assignments | Direct | Once/Semester | >=60 |

Course Contents

UNIT - I Introduction of Microprocessor

Microprocessor Architecture and its operation, Study of 8085 Microprocessor Pin out and Signals, Memory organization and Memory Mapping, Interfacing devices and review of input / output devices, Latches Buffers Decoders as 74245, 74139. Block diagram and working of 8085 based microcomputer system.

UNIT - II Programming Concepts of Microprocessor

Classification of Instructions, Instruction format, Instruction timing and operation status, Program writing skills of Hand Coding, Expected execution for simple programs, Assembly language programs and debugging, Addressing Modes, Status of Flags, Data transfer, Arithmetic, Logical operations with 16 bit, Counters and Timing Delays. Debugging, Stack and Subroutines, Introduction of Assembler Programming.

UNIT - III Introduction of Microcontrollers

Architecture of 8051. Comparison with microprocessor, Pin diagram, clock and oscillator, flags, PSW, stack, Internal memory, ideal mode, power mode, SFR, Counter, Timer mode, Serial I/O and Interrupt structure.

UNIT - IV Programming concepts of Microcontroller

Instruction set and programming of 8051. Bus standards such as RS232-C, RS485 and IEEE488

UNIT - V Interfacing Peripheral Devices

Basic Interfacing concepts, Interfacing input keyboard, interfacing output display [LED/LCD], Study of 8279 keyboard / display interface, Memory interfacing, Interfacing Devices study such as 8155 and 8255. Interrupts and Interrupt Handling. Study of Interrupt Controller chip 8259. Study of 8253, 8257, 8251 with Block Diagram and one example of interfacing.

UNIT-VI Microprocessor and Microprocessor Applications in Printing Technology

Stepper Motor Drive and Controller, Printer Interfacing with 8085, Colors Monitor Controller, Microprocessor based Sequence Controller, Concept of Programmable logic controller, with block diagram and simple programming (8 bit) related to specific printing operation sequence. Study of Offset Press and Paper Cutting Machine.

Term Work –

Term Work shall consist of following TEN experiments;

1. Write and execute Programs for
 - a) Addition, Subtraction (8 bit and 16 bit)
 - b) Multiplication, division (8 bit)
2. Write and Execute Programs for
 - a) Time delay using Register Pair
 - b) Decade counter
 - c) Up / Down Counter
 - d) Pulse Timing for Flashing Lights
3. Study of interfacing chips 8279
 - a) Chip study waveform Observation
 - b) Program related to printing field application
4. Write and Execute a Program for Serial Data Transfer.
5. Study of Interrupt Controller 8259
6. Interfacing with ADC/DAC (8 bit only)
7. Interfacing of Stepper Motor
8. Study of 8255 Chip & Interfacing with Printer(any type)
9. Study of EPROM Programmer

OR

Study of Timer Controller Chip 8253

10. Study of PLC and Simple Program Execution using PLC (8 bit / 16 bit any one)

Reference Books

1. R. S. Gaonkar Microprocessor Architecture, programming and applications with 8085, Wiley Eastern Publication.
2. A. P. Mathur Microprocessor architecture & applications, TMH.
3. Lance leventhal Programming with 8085, Mc Graw Hill.
4. “Microprocessors and Microcontrollers” Jhadhe,Thavare, Nirali Prakashan

5. Kenneth Ayala, "8051 microcontroller" PHI
6. Microprocessor Applications Douglas Hall - McGraw Hill
7. 8085 peripheral & application manual - Intel.
- 8 Microcontrollers by Mazidi
- 9 Ajay Deshmukh , "Microcontroller Theory and application " TMH