E-mail/Speed Post

GOVERNOR'S SECRETARIAT, BIHAR

RAJ BHAVAN, PATNA-800022

Letter No.-BNMU(Regulation) -14/2019- /GS(I), Dated-

From,

Vinod Kumar Tiwari
Officer on Special Duty (Judl.)

To,

The Vice Chancellor,
B.N. Mandal University,
Madhepura-852113.

Sub:- Regarding approval of Draft Admission Ordinance & Regulations of different courses of B.Voc.

Ref:- Letter no.- GS(DRA-145/19)-1568/19 dated- 19.12.2019

Sir,

I am directed to invite a reference to the Letter no. BSHEC/O&R/BNMU/B.Voc/52/2022-294 Patna, dated-17.06.2022 received from the Member Secretary-cum-State Project Director, State Higher Education Council, Govt. of Bihar, Patna as well as letter no.-GS(DRA-145/19)-1568/19 dated-19.12.2019 of the Registrar, B.N. Mandal University, Madhepura on the subject noted above and to inform that the Hon'ble Chancellor, after due consideration of the recommendation made by Member Secretary-cum-State Project Director, State Higher Education Council, Govt. of Bihar, Patna and advice of the Advisory Committee and in exercise of powers conferred upon him under section 38(2) and 39(ii) of the Bihar State University Act,1976 as amended up to date, has been pleased to approve the draft Admission Ordinance and Regulations of different Courses of B.Voc., namely **(1) DTP & Printing Technology (2) Accounting & Taxation (3) Information Technology (4) Hardware and Networking Technology (5) Health Care (Medical Immaging Technology)** in B.N. Mandal University, Madhepura. (Copy enclosed).

The University is further directed to run all these courses strictly in consonance with mandatorily adhering to the conditions as mentioned in UGC Guidelines for National Skills Qualifications Framework (NSQF).

Further necessary action may kindly be taken accordingly.

Yours faithfully

Encl:- As above.

Sd./-
(Vinod Kumar Tiwari)
Officer on Special Duty (Judl.)

Memo No.-BNMU(Regulation) -14/2019- /GS(I), Dated-

Copy alongwith a copy of approved draft Ordinance and Regulations of different Courses of B.Voc. in B.N. Mandal University, Madhepura forwarded to the Principal Secretary, Education Department, Govt. of Bihar, Patna for information and necessary action.

Encl:- As above.

Sd./-
Officer on Special Duty (Judl.)

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GOVERNOR'S SECRETARIAT, BIHAR

RAJ BHAVAN, PATNA-800022

Memo No.-BNMU(Regulation) -14/2019- /GS(I), Dated- .

Copy forwarded to the Member Secretary-cum-State Project Director, State Higher Education Council, Govt. of Bihar, Bihar State Text Book Publishing Corporation Ltd. Campus, Budh Marg, Patna-800001 / Registrar, B.N. Mandal University, Madhepura-852113 for information.

Sd./-
Officer on Special Duty (Judl.)

Memo No.-BNMU(Regulation) -14/2019- 1341 /GS(I), Dated- 12/08/2022

Copy alongwith a copy of approved draft Ordinance and Regulations of different Courses of B.Voc. in B.N. Mandal University, Madhepura forwarded to the Incharge, NIC / Computer Cell, Raj Bhavan, Bihar, Patna for uploading on the website of Raj Bhavan / Custodian, Guard file for record.

12/08/2022

Encl:- As above.

Officer on Special Duty (Judl.)

MADHEPURA COLLEGE, MADHEPURA

Kaushalya Gram, Madhepura,Bihar-852113

(Affiliated by BNMU Madheura)

B.Voc Degree

Syllabus of DTP & Printing Technology

Vinod Kumar Tiwari
Officer on special Duty (No.5[illegible])

Bye-Laws/Regulation for B.Voc Programme

At

Madhepura College,

Kaushalya Gram

Madhepura, Bihar

University :- B.N. Mandal University

Programme Approved

- B.Voc in information Technology
- B.Voc in computer Hardware & Networking
- B.Voc in DTP & Printing Technology
- B.Voc in Accounting & Taxation

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Officer on Special Duty (Admin)

Regulation/Bye Laws

About the B.Voc Programme

Name of the college: Madhepura College

Kaushalya Gram, Madhepura

B.N. Mandal University, Madhepura

Introduction :

The University Grant Commission (UGC) has launched a scheme on Skill Development Based on Higher Education as part of college, leading to Bachelor of Vocation (B.Voc) Degree Madhepura College Kaushalya Gram Madhepura has been approved the course, Bachelor of Vocation in

- B.Voc in information Technology
- B.Voc in computer Hardware & Networking
- B.Voc in DTP & Printing Technology
- B.Voc in Accounting & Taxation

Under NSQF Scheme

Bachelor of Vocation in Information Technology, Bachelor of Vocation in Computer Hardware & Networking, Bachelor of Vocation in DTP & Printing Technology are belonging to the faculty of Science and that of Bachelor of Vocation in Accounting & Taxation belongs to the faculty of commerce.

Course Objective:

- To Provide Indicious mix of Skills relating to a Profession and appropriate content of general education.

Vinod Kumar Tiwari

- To ensure that the students have adequate knowledge and skill, So that they are work ready at each exit point of the Programme.
- To integrate NSQF within the undergraduate level of higher education in ord in to enhance employability of the graduates and meet industry requirement Such graduates apart from meeting the needs of local and national industry are also expected to be equipped to become part of the global workforce.
- After the Successful Competition of this Vocational Programme (Course) the student will have ability to acquire Professional Skills with the Concerned disciplined of the Programme, and it is expected that they could get job easily in the market. They will have capability in professional skills and competencie in the field of Information Technology. Computer Hardware & Networking, Desktop Publishing and Printing Technology and the most important field of Job, Trade, Business, Stock market, International as well as National Trades etc in Accounting &Taxation.

Duration of the course:

- The Bachelor of Vocation in Programmed in
  - Bachelor of Vocation in Information Technology
  - Bachelor of Vocation in Computer Hardware & Networking
  - Bachelor of Vocation in DTP & Printing Technology
  - Bachelor of Vocation in Accounting & Taxtion

Shall be of Three(03) Academic year, having Semester of Six Months each i.e six semesters.

The curriculum in each of the years of the programme would be a suitable mix of general education and skill development Components. General Education Component shall have 40% of the total credits and 60% credits will be of skill component.

Admission and Fee:

- The minimum educational qualification for admission in Bachelor of Vocation Programme in
  - Information Technology
  - Computer Hardware & Networking

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- DTP & Printing Technology
- Accounting & Taxation

Is a candidate will be class 12 pass or equivalent from any recognized boar or university in any stream.

- ❖ Reservation to sc, ST, OBC and PWD Categories as per UGC guidelines and state govt. reservation policy.
- ❖ There Shall be no age bar for admission in the Skill based certificate i.e. degree programs under NSQF.

Fee Structure:

Admission fee at the time of Admission	-	Rs. 2500/-
Semester Fee	-	Nil
Registration Fee	-	Rs. 300/- or As decided by the University
Examination Fee	-	Rs. 800/-or As decided by the University
Library Fee	-	Nil
Laboratory Fee	-	Nil
Industrial visit for Training	-	As per UGC guidelines (provided by UGC)

- ❖ Any Miscellaneous Fee may be decided by the Advisory Committee, as per need (If found necessary)
- ❖ Any other fee for aided courses may be decided by the university as per prevalent. Mechanism, if in the need.
- ❖ Miscellaneous fee
- ❖ e.g. CLC/CC and other College Development Fee may/may not be imposed (as decided by the Advisory Committee)

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PROGRAMME STRUCTURE

Semester - I						
Paper	Title	G.C./S.C.	Credits	Full Marks	External	Internal
1	Listening And Speaking Skills In English	G.C.	6	100	80	20
2	Word Processing	G.C.	6	100	80	20
3	Fundamentals of DTP	S.C.	9	100	80	20
4	Adobe Page Marker	S.C.	9	100	80	20

Semester - II						
Paper	Title	G.C./S.C.	Credits	Full Marks	External	Internal
1	Data Processing through MS Excel	G.C.	6	100	80	20
2	Adobe In Design	G.C.	6	100	80	20
3	Image Editing for Printing	S.C.	9	100	80	20
4	Graphic Design and Corel Draw	S.C.	9	100	80	20

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Semester - III						
Paper	Title	G.C./S.C.	Credits	Full Marks	External	Internal
1	Planning for Print Production	G.C.	6	100	80	20
2	Xerox Scanning and image Generation	G.C.	6	50	40	10
3	Adobe Illustrator	S.C.	5	50	40	10
4	Post Press Operations	S.C.	5	50	40	10
5	Project Work-I	S.C.	8	150	75	75

Semester - IV						
Paper	Title	G.C./S.C.	Credits	Full Marks	External	Internal
1	Soft Skill & Personality Development	G.C.	6	100	80	20
2	Offset Printing Technology	G.C.	6	100	80	20
3	Graphic Reproduction and Color Separation	S.C.	6	100	80	20
4	Electrical Drives And Control	S.C.	6	100	80	20
	Internship-I (Two Week)	S.C.	6			

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Semester - V						
Paper	Title	G.C./S.C.	Credits	Full Marks	External	Internal
1	Digital Printing	G.C.	6	100	80	20
2	Web Offset Technology	G.C.	6	50	40	10
3	Technical and Scientific	S.C.	5	50	40	10
4	Binding Technology	S.C.	5	50	40	10
5	Project Work-II	S.C.	8	150	75	75

Semester - VI						
Paper	Title	G.C./S.C.	Credits	Full Marks	External	Internal
1	Entrepreneurship Development	G.C.	6	100	80	20
2	Costing for Printing Press	G.C.	6	100	80	20
3	Printing Press Management System	S.C.	6	100	80	20
4	Offset Plate Making	S.C.	6	100	80	20
5	Internship –II (Two Week)	S.C.	6			

- G.C. – General Component
- S.C. – Skill Component

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MADHEPURA COLLEGE, MADHEPURA

Syllabus Printing Technology

Program- B.VOC	Externna-80
Branch-DTP & Printing Technology	Internal-20
Semester-1	Total Marks-100
Paper -I	Time-3hours

LISTENING AND SPEAKING SKILLS IN ENGLISH

Objectives:

To introduce the students to the speech sounds of English in order to enable them to listen to English and speak with global intelligibility. To enable the students to speak English confidently and effectively in a wide variety of situations. To help the students to improve their reading efficiency by refining their reading strategies.

MODULE -I

I Speech Sounds: Phonemic symbols – Vowels – Consonants – Syllables – Word stress – Stress in polysyllabic words – Stress in words used as different parts of speech – Sentence stress – Weak forms and strong forms – Intonation

Sample activities:

1. Practice reading aloud. Use a variety of texts including short stories, advertisement matter, brochures, etc

2. Read out a passage and ask the students to identify the stressed and unstressed syllables.

MODULE - II

Basic Grammar: Articles - Nouns and prepositions - Subject-verb agreement - Phrasal verbs - Modals - Tenses - Conditionals – Prefixes and suffixes – Prepositions -Adverbs – Relative pronouns - Passives - Conjunctions - Embedded questions - Punctuation – Abbreviations-concord- collocations- phrasal verbs- idiomatic phrases

Nirmal Kumar Tiwari
Officer on Special Duty (Admin)

Sample activities:

- Ask students to write a story/report/brochure, paying attention to the grammar.

MODULE – III

Listening: Active listening – Barriers to listening – Listening and note taking – Listening to announcements – Listening to news on the radio and television.

Sample activities:

1. Information gap activities (e.g. listen to a song and fill in the blanks in the lyrics given on a sheet)
2. 2. Listen to BBC news/ a play (without visuals) and ask the students to report what they heard.

MODULE- IV

Speaking- Fluency and pace of delivery – Art of small talk – Participating in conversations – Making a short formal speech – Describing people, place, events and things – Group discussion skills, interview skills and telephone skills.

Sample activities:

1. Conduct group discussion on issues on contemporary relevance.
2. Ask students to go around the campus and talk to people in the canteen, labs, other departments etc. and make new acquaintances.
3. Conduct mock interviews in class.
4. Record real telephone conversations between students and ask them to listen to the recordings and make the corrections, if any are required.

MODULE – V

Reading: Theory and Practice – Scanning – Surveying a textbook using an index – reading with a purpose – Making predictions – Understanding text structure – Locating main points – Making inferences – Reading graphics – Reading critically – Reading for research.

Books for Reference:

1. V.Sasikumar, P KiranmaiDutt and GeethaRajeevan, .Communication Skills in English.Cambridge University Press and Mahatma Gandhi University.

2. Marilyn Anderson, Pramod K Nayar and Madhucchandra Sen. Critical Thinking,

3. Academic Writing and Presentation Skills. Pearson Education and Mahatma Gandhi University.

For Further Activities

1. A Course in Listening and Speaking I & II, Sasikumar, V.,KiranmaiDutt and Geetha Rajeevan, New Delhi: CUP, 2007

2. Study Listening: A Course in Listening to Lectures and Note-taking Tony Lynch New Delhi: CUP, 2007.
3. Study Speaking: A Course in Spoken English for Academic Purposes. Anderson, Kenneth, Joan New Delhi: OUP, 2008

Program- B.VOC	Externnal-80
Branch-DTP & Printing Technology	Internal-20
Semester-1	Total Marks-100
Paper -II	Time-3hours

WORD PROCESSING

Module –I

MS Word -Basics of Word Processing. Text selection, Opening, Creating, saving Documents, Cursor control, using interface (menu, tool bars), Editing Text (copy, delete, move, etc.). Finding and Replacing text, Spell check feature, Grammar facility, auto text, etc.

Module-II

(Skills only-Typing speed of lower level is the standard to be attained after the semester) Type setting – English. Home Keys and Basic Drills. Left Hand asdf and fdsa skills. Right hand jkl; and ;lkj skills. Both Hands , drills. Words, Phrases and more Vowels. Left hand, write hand and both hands. Two key letters and more word practice. Using third finger. Bottom row keys. draw from top to bottom, bottom to top, simple sentences, Punctuation, etc

Common letter combinations. Use of Tab keys and Shift keys (Right and left). Left hand letters and Right shift keys, Right hand letters and left shift key. Comma, exclamation, full stop, Punctuation, etc. Right hand only words, left hand only words, words with alternate hands letters, upper character practice, sentence practice. Timed typing tests. Free typing tests. Ten word tests, Twenty word tests, twenty five word tests, up to sixty word tests. Key Board short keys. Alt+F4,Ctrl+w, Ctrl+F2, Esc, Home, End, Ctrl+Home, Ctrl+End, Function Keys, etc.

Vinod Kumar Tiwari
Officer on Special Duty (Acad)

basic idea on file formats, font types, layout concept, and the coting works of a DTP center.

Module I

Desk Top Publishing: Introduction, Meaning, Features, Merits and Demerits. History of DTP. DTP softwares. Prepress-press, Press and post-press operations. Types of publishing-Electronic & Physical,

Module II

Typography : Types(Fonts), Type sizes, Different families (Style) Point system and other system of measuring. casting off. Proof reading and its marks. Composing Process: Introduction of various methods of composing. Different file formats used in prepress unit.

Module III

Paper Introduction and preparation. Various paper sizes (Conventional and metric) and their uses. standard paper sizes used in printing industry- A4, A3, Dummy, Crown, Crown ¼, etc. Various paper calculations. Various types of papers. GSM. News paper, wrapping, security paper, quality paper, etc.

Module IV

Concept of layout- advantages of layout. Page layout, Print Layout (or Reading Layout), Notebook Layout, Publishing Layout. Different file formats used in prepress unit. Vector graphics, raster graphics, bitmap image

Module V

Networking Concept, Printing Process. LAN, MAN,WAN. Types of connectors, fiber technology, switches, routers, IP configuration, mac id, mac configuration. File& Printer Sharing. Installation of printers. Configuration. Trouble shooting.

Books for Reference:

1. Learning Desk Top Publishing (DTP), Ramesh Bangia, Khanna Book Publishing Co. (P) Ltd.
2. 2. DTP Fundamentals, ABPL Publications.

Program- B.VOC	Externnal-80
Branch-DTP & Printing Technology	Internal-20
Semester-I	Total Marks-100
Paper -IV	Time-3hours

ADOBE PAGE MAKER

General Objectives

This part is intended to give practical awareness on the Adobe page maker . They must be able to handle the software for practical uses. Printing of notices, compilation of books, etc should also be familiarized. The paper is mainly skill focused.

Module I

Basic Concepts: Creating and opening publications, using tool box, working with palettes, text and graphics, starting publication from a template, paste board, saving and closing.

Module II

(Skills only-Typing speed of lower level is the standard to be attained after the semester) Type Setting- Malayalam -Solid and tabular setting of bilingual/multi script language software . Use of ism publisher software in typing malayalam. Home keys and basic drills. Left hand and right hand drills. Both hands, drills.

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Officer on Special Duty (Judicial)

Books for Reference:

Adobe page maker 7.0, Proot, Cengage Learning Pagemaker in Easy Steps, Scott Basham, Dreamtech Press Pagemaker made easy, ABPL Publications

Program- B.VOC	Externnal-80
Branch-DTP & Printing Technology	Internal-20
Semester-II	Total Marks-100
Paper-I	Time-3hours

DATA PROCESSING THROUGH MS EXCEL

Objective(s):

To familiarize with the Microsoft Excel and to equip with the knowledge on the advanced formulas in a comprehensive manner. Further, to explore the characteristics of advanced Excel and VBA. This paper is skill based and is advised to be imparted through Workshops in the computer lab.

Module-I

Introduction to MS Excel: Interface, Tabs and Ribbons, Document Windows, Office Button and Save, Entering Data, Fonts, Fills, and Alignment, Cut, Copy, and Paste, Paste Special, Undo and Redo, Moving, Finding, and Replacing a Value, Cell Styles, Comments. Formatting Numbers- Currency Format, Format Painter, Formatting Dates, Custom and Special Formats. Managing Worksheets- Naming and Moving Worksheets, Copying Worksheets, Adding, Deleting and Hiding Worksheets, Grouping Worksheets, Moving, Copying, Deleting and Hiding Grouped Worksheets. Modifying Rows and Columns- Inserting and Deleting Columns and Rows, Inserting & Deleting Cells, Inserting Multiple Columns & Rows, Modifying Cell Width and Height, Hiding and Un-hiding Rows and Columns.

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Officer on Special Duty (Publication)

Module-II

Understanding Formulas: Introduction, Using Operations, Creating Formulas, AutoSum, Common Formulas, Searching for Formulas, Copying Formulas, Using Relative and Absolute References. Changing Views - Workbook Views, Show/Hide, Zoom Features, Freeze Panes, Split Windows, Viewing Multiple Windows, Minimize The Ribbon, Worksheet Backgrounds, Watermarks, AutoFill a Series, AutoFill Non-Adjacent Cells, AutoFill on Multiple Sheets, Creating Custom Lists, Series Formatting. Conditional Formatting - Highlight Cells Rules, Top/Bottom Rules, Data Bars, Color Scales, Custom Formatting Rule. Tables - Insert a Table and Style Options, Add Rows and Columns, Perform a Function in a Table, Summarize With Pivot Table.

Module-III

Data Tools: Data Validation, Drop-Down Lists, Removing Duplicates, Text To Columns, Goal Seek, Scenario Manager. Referencing Formulas- Multiple Sheet References, Consolidating Data - With or Without Links, Trace the Precedents and Dependents, Using the Watch Window. Ranges and Dates- Cell Names, Named Ranges, Formulas with Cell Names, Date Formulas. Lookups – VLOOKUP, VLOOKUP Exact Match, HLOOKUP, HLOOKUP Exact Match. Conditional Logic - IF Statement, Nested IF, AND, OR, NOT, IFERROR, SUMIF, AVERAGEIF, COUNTIF & COUNTIFS, SUMIFS, AVERAGEIFS. Text Formulas - Case Formulas, Fix Number Fields, Trim Spaces, Substitute Text.

Module-IV

Introduction to Charts: Chart Types, Instant Chart, Update Chart, Column Chart, Picture Fill, Adjust Chart Size, Line Chart, Scatter Chart. Formatting Charts - Chart Styles, Chart Layouts, Add Labels, Axis Options, Chart Title, Legends, Data Labels. Adding Graphics - Insert Pictures, Modifying Pictures, Insert Shapes, Insert SmartArt, Apply Themes, Arrange. Outline, Sort, Filter, and Subtotal - Group and Ungroup, Sort Data, Sort Multiple Levels, Filter Data, Advanced Filter, Conditional Sorting and Filtering, Sorting with Custom Lists, Subtotal. PivotTables - Creating

PivotTables, Choosing Fields, PivotTable Layout, Filtering PivotTables, Modifying PivotTable Data, Pivot Charts.

Module-V

Protecting Data: Workbook Passwords, Protecting Workbooks, Unlocking Cells. Collaboration - Document Properties, Inserting Hyperlinks, Sharing a Workbook, Track Changes, Accept/Reject Changes, Mark as Final. Printing - Page Orientation, Page Breaks, Print Area, Margins, Print Titles, Headers and Footers, Scaling, Sheet Options. Saving a Workbook - Save As Previous Version, Auto Recover Save Options, Templates, Save As PDF, use of add-in, Save As Web Page, Macro-Enabled Workbook. Macros - Macro Security, Recording a Macro, Assign a Macro to a Button or Shape, Run a Macro upon Opening a Workbook, How to Inspect and Modify a Macro, Clubbing VBA with MS Excel, Excel Forms using VBA-Creation of Database

Books for Reference:

1. Excel 2010 All-in-One for Dummies" by Greg Harvey

2. The Mr. Excel Library Series" by Bill Jelen

3. Slaying Excel Dragons: A beginner"s guide to conquering Excel"s frustrations and making Excel fun" by Mike Girvin and Bill Jelen

4. Excel Charts, by John Walkenbach

5. Quick Start Guide from Beginner to Expert, by William Fischer

6. Data Processing through MS Excel, ABPL Publications

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Program- B.VOC	External-60
Branch-DTP & Printing Technology	Internal-20
Semester-II	Total Marks-100
Paper -II	Time-3hours

ADOBE IN DESIGN

MODULE -I

Document and column set up for a variety of publications. Identification of tools. Use of rulers, guides and snap-to guides. Page formatting. Formatting types including styles, sizes, leading, tracking, kerning.

MODULE - II

Using the edit menu – cutting, copying, pasting Multiple pasting, editing stories, spell checking Formatting paragraphs, moving/resizing text blocks, leading adjustment etc.

MODULE - III

Placing graphics, resizing graphics, text wraps Setting up templates and style palettes Grouping and aligning objects, multiple pasting with "step and repeat: functions Graphic formats, links, resolutions Color, color libraries and color separation

MODULE -IV

Bi-fold brochures and other custom layouts. Rotation tool, drop caps, page numbering and insertion of special symbols. Styles and creating a custom style palette, use of templatesPrinting solutions and PPD"s and PDF"s generation. Create

Manoj Kumar Tiwari
Officer on Special Duty (Technical)

and publish printed books, brochures, digital magazines, iPad apps, and interactive online documents with Adobe In Design

MODULE- V

Printing solutions and PPD"s and PDF"s generation. Create and publish printed books, brochures, digital magazines, iPad apps, and interactive online documents with Adobe InDesign

Books for Reference:

Adobe InDesign: Design Basics, Bittu Kumar, V&S Publishers

Adobe InDesign, ABPL Publications

Program- B.VOC	Externnal-80
Branch-DTP & Printing Technology	Internal-20
Semester-II	Total Marks-100
Paper -III	Time-3hours

IMAGE EDITING FOR PRINTING

MODULE- I

Image Fundamentals: - Digital image pixel. Resolution. DPI, raster image/bitmaps. Vector image/graphics. Various File Format:- Bitmap, JPEG, PSD, PDD, TIFF,GIF, WMF.

MODULE -II

Understanding Various Tools:- Marquee- Rectangular/Elliptical. Move Lasso, Polygonal l Lasso Magnetic Lasso, Magic wand. Crop Air brush, Paint brush, Pencil, Rubber Stamp, Pattern stamp, Erase, Paint bucket, Direct selection, Path component selection , Pen custom shape, eye dropper, Hand Zoom.

MODULE- III

Understanding various Palettes:-Navigator, info, Color, Swatches Style History, Layers. Paths, Character, Paragraph, Foreground Colors. Background colors. Default colors. Switch colors. Details about Status Bar. Option Bar. Edit Image in Standard mode. Quick Mask Mode.

MODULE- IV

Various Image Display Options:- Standard Screen mode. Full Screen Mode with Menu Bar, Full Screen mode. Various Edit Commands:-Transform Preferences, Define Brush etc. Various Select commands, Various Filter Effects, Render 3D Transform, Lens Flare. Lightning Effects. Motion Blur. Radial Blur... Various View Commands. Print Option

MODULE- V

Various Image Commands : Inverse. Adjust, Extract, Liquify etc. Mode RGB /CYMK /LAB /Grayscale. Adjust Brightness/ Contrast. Hue/ Saturations, desaturate, Replace Colours, invert, Variations, Canvas size, Rotate canvas, crop, Trim- Various Layer Commands. Rearranging Layers, Lock Layers, Merge down, Merge. Visible, Flatten Image. Working with layers set.

Books for Reference:

Photoshop CS: Essential Skills, Mark Galer, Philip Andrews, Focal Press
Photoshop CS, ABPL Publications

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Officer on Special Duty (Judicial)

Program- B.VOC	External-80
Branch-DTP & Printing Technology	Internal-20
Semester-II	Total Marks-100
Paper -IV	Time-3hours

GRAPHIC DESIGN AND COREL DRAW

MODULE- I

Introduction : Creating Opening drawing. Setting up the drawing page. Using the rulers. Grid. And guidelines. Viewing document.

MODULE- II

Drawing and Shaping Objects:- Drawing. Moving & Shaping Object, drawing lines and curves, dimensions line.

MODULE- III

Working with Style & Templates. Organizing Objects:- Arranging & Changing the order of objects. Grouping, Ungrouping. locking and unlocking objects. Using and setting layers Aligning & editing objects data.

MODULE- IV

Working with pattern and texture fills. Applying and editing line ending shapes, splitting and erasing portions of objects positioning moving stretching and rotating objects Working with multiple on screen color palettes. Adding graphics symbols and specials character editing. Formatting text & paragraph, hyphenating text.

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

MODULE- V

Creating and editing blends , envelopes. Creating and modifying vector and bitmap . Extrusions, creating drop shadow. Objects, working with linked bitmap. Applying special effects to bitmap by 3D. Effects : blur effects, contour effects. Creating documents for various formats using layout. Creating color seperations , working with halftone and bitmap screens. Importing and exporting files, OLE (Object Linking and embedding) Printing of document/ Design.

Books for Reference:

Corel DRAW 12: The Official Guide (Corel Press), Steve Bain, McGraw-Hill Osborne

Graphic Design and Corel Draw, ABPL Publications

Program- B.VOC	Externnal-80
Branch-DTP & Printing Technology	Internal-20
Semester-III	Total Marks-100
Paper -I	Time-3hours

PLANNING FOR PRINT PRODUCTION

Module- I

Print Planning: Design concerns for printing, Design consideration, Factors to be considered in print planning - Layout for Leaflets, Pamphlets, Booklets, Catalogues, Brochures, Manuals, Books, Magazines, News papers, Business manuals, Commercial stationery, Labels, Carton, Folders and other forms of direct mail literature.

Module- II

Paper. Main classes of paper and board sizes, paper requirements for different printing process, paper handling. Paper properties- runnability and printability- structural: formation, 2 sidedness, grain direction- physical: GSM, caliper, bulk, porosity, smoothness, dimensional stability, curves, moisture content and rh- optical: glosses, brightness, colour, opacity-chemical:pH, ash content, tensile, burse, tear internal bonding, fold endurance, stiffness, pick resistance.

Module- III

Offset inks, flexo inks, gravure inks, screen inks and specialty inks. Solvent based inks- Formulations- Material selection, properties, drying mechanisms. Water based inks – Formulations- Pigments & dyes, acrylic binders, low voc solvents & additives. Ink properties- viscosity, pH, surface tension, testing, and drying mechanisms. UV based inks- Composition- pre polymer, photo initiators, diluents, colorants, and additives – formulations, properties, testing, light source-Selection & drying mechanisms.

Module -IV

Paper coatings- coating materials- methods-properties, lamination- types, materials used Metals- treatment, methods, corrosion-protection and coating types. Metallization manufacturing process and properties. wood- varnishing types- matt & gloss finish and coatings. Plastics- surface treatment- chemical, plasma, corona –methods. Lamination and coatings.

Module- V

Availability of various paper types, ink types and paper coatings. Popular brands. Cost difference.

BOOKS FOR REFERENCE:

Planning for print production, ABPL Publications

Program- B.VOC	Externnal-40
Branch-DTP & Printing Technology	Internal-10
Semester-III	Total Marks-50
Paper -II	Time-3hours

XEROX, SCANNING AND IMAGE GENERATION

MODULE- I

History of photocopying, stencil duplicator or mimeograph machine, Xerox, Photocopying machines, working principle of photocopy machine, Functions of a Photocopier.

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

MODULE -II

Copying of image and documents. xerox and photocopy, Single side, Duplex, Combine 2 items, 4 items, etc. Color and black & white. Toner saving. Toner refill. Paper jam and Trouble shooting.

MODULE- III

Principle of scanning, Types of scanners (Flatbed & Drum) and its use, Resolutions, DPI, LPI, PPI Graphic drawings inputs of pictures, sketches etc. Preparation of OCR, Use of scanner for picking up illustration, line drawings, Setting of Scanner, Selection line per inch, Dots per inch, Pixel inch. Selection of highlights. Middle tone and shadow are. Contrast, Brightness, Saturation.

MODULE- IV

Reading of color strip and do color correction Automation, Order Processing, Pre fighting and Data Optimization, Versioning, Impositioning, Ripping and Calibration, Proofing, PDF – standards and Versions, Creation of PDF – within application, from acrobat, Crossmedia PDF; Screening – AM, FM, Hybrid, Rational and Irrational.

MODULE -V

Color management, Archiving. Making of OCR. Digital images, Pixel based images, digitization of images, Digital work flow, Half toning, Image and type rendering, colour gamut, image quality, spatial and tonal resolution of images, visual thresholds.

BOOKS FOR REFERENCE

Xerox, Scanning and Image Generation, ABPL Publications

Program- B.VOC	External-40
Branch-DTP & Printing Technology	Internal-10
Semester-III	Total Marks-50
Paper -III	Time-3hours

ADOBE ILLUSTRATOR

Module- I

Introduction. Artboards, viewing artboards, setting preferences, vector graphics.

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Module- II

Understanding various tools-selection, direct selection, magic wand, lasso, pen, type tool, line segment, rectangle, paintbrush, pencil, blob brush, eraser, rotate, scale, free transform, mesh, gradient, eyedropper, blend tool, symbol sprayer, column graph, art board, slice, hand, zoom, fill, swap fill/stroke, stroke, color, none, gradient.

Module -III

The illustrator workspace- tools panel, main menu, control panel, panel docking area, art board, status bar, creating a logo in illustrator, using pen tool and pencil tool, making round corners, adding special effects, expand appearance, live trace, blur effect, cropping artworks, grouping objects, using rotate tool, arranging objects, adding text, pathfinder, create outlines, aligning objects, symbols, gradients, meshes and color blends, importing artwork from photoshop, saving art work, file formats, exporting artwork, creating adobe pdf files.

Module- IV

working with type on a path, line and character spacing, formatting paragraphs, tabs, character and paragraph styles, Adding a gungy background, creating a rectangle, adding inner glow effect, using transparency panel, working with type tool, creating outlines, adding 3d effects, using unite from path finder panel, adding gradient style, glows and feathering, clipping mask, adding shadow, applying Gaussian blur.

Module- V

Creating logos, illustrations, artworks, business cards, letterheads, notices, film posters, Leaflets, Brochures, labels, cartons, Exporting to pdf and jpeg format. Proof corrections with appropriate proof reading marks. Coasting off, Typography, proof reading symbols, proof reading marks used in marking copy.

BOOKS FOR REFERENCE

Adobe Illustrator CC Classroom in a Book, Brian Wood, Adobe Press
Adobe illustrator, ABPL Publications

Program- B.VOC	External-40
Branch-DTP & Printing Technology	Internal-10
Semester-III	Total Marks-50
Paper -IV	Time-3hours

POST PRESS OPERATIONS

Module -I

Working of paper cutting Machines, Types of paper cutting machines. Semi automatic and automatic paper cutting machines, programmable paper cutting machines. Paper Cutters & Trimmers- guillotine cutter and a rotary cutter.

Module -II

Binding Materials: Covering materials of all types, preparation and treatment in covering. Miscellaneous materials such as thread cords, tapes, mull, eyelets etc. Purchase, selection, care and use of all types of materials. Methods of dealing with fungi and insect pests.

Module -III

Types of adhesives – Drying adhesives – solvent based adhesives, water based adhesives, pressure sensitive adhesives. Hot melt adhesives – pressure sensitive hot melts, applying hot melts. Curing adhesives – cure by mixing two or more components, cure when heated, exposure to moisture.

Module- IV

In setting and wire stitching by semiautomatic and automatic means. Wire stitching, thread stitching, adhesive binding, sewing. Spiral wire binding, plastic comb binding, loose-leaf binders; thong and ring binders.

Module -V

Principles and operation of perforating, punching, drilling, round cornering, indexing, creasing, gluing, eyeleting, ruling and numbering. Maintenance of these equipment for trouble free running; production capacities.

BOOKS FOR REFERENCE

Post Press Operations, ABPL Publications

Program- B.VOC	Externnal-75
Branch-DTP & Printing Technology	Internal-75
Semester-III	Total Marks-150
Paper -V	

PROJECT WORK- I

DIGITAL MAGAZINE

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Students must do this project individually. And it should be a digital magazine developed in Adobe illustrator. Project should be done under the guidance and approval of the supervising faculty/faculties. Students have to complete the project within the given time period, and they should keep all the important paper works (abstract, design, layout, data sheet of data collection etc.) along with them. Students must submit the finished project along with the required paper works and a comprehensive report, to the Head of the Department, before the day of the project evaluation. The project will be evaluated by the external and internal examiners appointed by the university. Delayed, incomplete submissions will be considered as per the university rules.

Program- B.VOC	External-80
Branch-DTP & Printing Technology	Internal-20
Semester-IV	Total Marks-100
Paper -I	Time-3hours

SOFT SKILLS AND PERSONALITY DEVELOPMENT

Module – I

Personal Skills: Knowing oneself- confidence building- defining strengths- thinking creatively- personal values-time and stress management.

Module – II

Social Skills: Appropriate and contextual use of language- non-verbal communication-interpersonal skills- problem solving.

Module – III

Personality Development: Personal grooming and business etiquettes, corporate etiquette,social etiquette and telephone etiquette, role play and body language.

Module – IV

Presentation skills: Group discussion- mock Group Discussion using video recording – public speaking.

Module – V

Professional skills: Organisational skills- team work- business and technical correspondence-job oriented skills-professional etiquettes.

Books for Reference:

1. Matila Treece: Successful communication: Allyun and Bacon Pubharkat.

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

2. Jon Lisa Interatid skills in Tourist Travel Industry Longman Group Ltd.
3. Robert T. Reilly – Effective communication in tourist travel Industry Dilnas Publication.
4. Boves. Thill Business Communication Today Mcycans Hills Publication
5. Dark Studying International Communication Sage Publication.
6. Murphy Hidderandt Thomas Effective Business Communication Mc Graw Hill.

Program- B.VOC	Externnal-80
Branch-DTP & Printing Technology	Internal-20
Semester-IV	Total Marks-100
Paper -II	Time-3hours

OFFSET PRINTING TECHNOLOGY

Module I

Principles of lithography, wetting of a solid surface by a liquid, emulsification of ink and fountain solution, fluid behavior in a nip. Basic configuration of offset machine. Sheet feeding and controls: Types of feeders, sheet control, drives, suction head mechanism, double sheet and no sheet detectors, side lays and front lays. Non-stop feeders. Sheet insertion and transfer systems, working principle, relative merits.

Module II

Printing unit configuration. Cylinders: Various configurations, design, requirements, plate and blanket clamping mechanisms, pressure setting, packing, print length variation, equal diameter, true rolling principles. Cylinder drives. Sheet transfer and reversal systems, perfecting, delivery grippers, settings, quick delivery mechanisms. Anti set-off spray device. Feeders, delivery and other system components for metal printing.

Module III

Blankets, rollers, blanket types, requirements, manufacture, performance attributes. Rollers, types, properties, behavior. Basic inking and dampening system configuration. Fountain solution requirements, composition, re-circulation system and dosing units, Ink/water balance.

Module IV

Printing and inline operations Make-ready operations, multi colour printing, automatic plate fixing, computer controls in printing, automatic blanket wash, roller wash systems. Spot varnishing, coating, numbering. Metal printing UV Dryers, Hot air and IR Drying systems. Print problem identification and quality control.

Module V

Quality control. Standards, Print Control Targets, Test Forms, In-line print quality measurement, inspection and control.

Vinod Kumar Tiwari

BOOKS FOR REFERENCE:

1. Manual for Lithographic Press Operation- A S Porter
2. Lithographic Technology –Edwin A Dennis, Olusegan Odesina
3. Introduction to Printing Technology-Hugh M Speirs
4. Offset Printing Technology, ABPL Pulbications
5. Sheet fed Press Operation-GATF
6. Offset Technology-C S

Program- B.VOC	External-80
Branch-DTP & Printing Technology	Internal-20
Semester-IV	Total Marks-100
Paper -III	Time-3hours

GRAPHIC REPRODUCTION & COLOR SEPARATION

Module I

Basic steps involved in planning a layout, factors to be considered while planning a layout assembly & masking materials, positive & negative film assembly, planning of multicolor work, punch & drill registration system, step & repeat work, imposition consideration for sheet fed & web fed press.

Module II

Color & color theory – Additive & subtractive -Terms to describe color, - color separation technique Direct & indirect method – GATF color triangles & color circle their use – modern color spaces - color matching – color original - color originals, selection and their characteristics – method of color measurement– color Gamut.

Module III

Prepress color proofing- DDCP- inkjet-thermal wax – chromalin proofing- factors in proofing- substrate- color of ink- solid ink density- trapping tone reproduction proofing methods- soft proof- digital proof- photomechanical proof- press proof- other proofing methods.

Module IV

Planographic plates: Introduction. Light sensitive coating-dichromate colloids, diazo compounds, photopolymers, diffusion and transfer methods, electrostatic. Sensitivity of coating to light. Dye sensitized photo polymerization, dark reaction, post exposure, safe lights, reciprocity law. Action of light sources on coatings, stabilities of coatings

Module V

Plate materials-zinc, aluminum, brass, copper, steel, chromium. Action of oil and water on metal – contact angle. Ability to withstand cracking. Susceptibility to dot sharpening. The plate base- cross

Vinod Kumar Tiwari
Officer on Special Duty (Academic)

section of an aluminum plate, cross section of a plastic plate. Graining of plates – mechanical graining, electrochemical graining, Anodized aluminum, plate washes.

BOOKS FOR REFERENCE:

Graphic reproduction & color separation, ABPL Publications

Program- B.VOC	External-80
Branch-DTP & Printing Technology	Internal-20
Semester-IV	Total Marks-100
Paper -IV	Time-3hours

ELECTRICAL DRIVES AND CONTROL

Objective: To impart general idea about the electrical aspects of printing machines.

Module I

Electric current, Watt, Ampere, Electric potential, control panel, MCB, ELCB, Electrical panel. AC, DC, Measurement of Voltage, Current, Power and energy, Single phase, Split phase, Three phase and its operation,

Module II

Types of Electric Drives – factors influencing the choice of electrical drives –speed control- heating and cooling curves – Loading conditions and classes of duty – Selection of power rating for drive motors with regard to thermal overloading and Load variation factors- medium power and components rating.

Module III

Drive motor characteristics Mechanical characteristics – Speed-Torque characteristics of various types of load and drive motors – Braking of Electrical motors, ic, rpm– DC motors: Shunt, series and compound - single phase and three phase induction motors.

Module IV

Conventional and solid state speed control of D.C. drives Speed control of DC series and shunt motors – Armature and field control, Using controlled rectifiers and DC choppers –applications.

Module V

Conventional and solid state speed control of a.c. drives Speed control of three phase induction motor – Voltage control, voltage / frequency control– Using inverters and AC voltage regulators –

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

applications. Power sources- Inverter, UPS, battery, safety measures-safety earthing. Connectors and cables- AC, SPh, DPh, TPh.

BOOKS FOR REFERENCE:

Electrical drives and control for printing machine, ABPL Publications

Program- B.VOC	
Branch-DTP & Printing Technology	
Semester-IV	

INTERNSHIP-I

After the completion of the fourth semester, students will have to undergo a minimum of two Weeks internship programme in a professional design studio or DTP centre attached to a offset/ web Printing press or flex printing press, or a news paper company, to understand various aspects in a design production atmosphere.

Students can choose a design studio in India or abroad for their internship. College will provide a certificate to prove their identity. A member of the faculty will supervise the student during their internship.

Studios having the following qualities can be chosen:

a. A minimum of two years' experience in designing field

b. Should have produced a minimum of three popular print designs for the last six months.

At the end of the internship, students should prepare a comprehensive report. The report and the specimens of the work done by the student should be attested by the organization. Student should also produce a certificate of internship from the organization. The report should be neatly typed in A4 size paper and in bound form having not less than 25 pages. A copy of the report has to be submitted to the Department before the commencement of the third semester classes. The department will be conducting an open- viva – voce for each student to evaluate the practical skill acquired by them from the training.

Program- B.VOC	Externnal-80
Branch-DTP & Printing Technology	Internal-20
Semester-V	Total Marks-100
Paper -I	Time-3hours

Vikash Kumar Tiwari
Officer on Special Duty (Technical)

DIGITAL PRINTING

Module I

History of printing, Traditional approaches to printing- Modern approaches to Printing. Different types of printing-Letter press, Direct Printing, Screen printing, Offset printing- sheet fed and web offset. Cold set printing, heat set printing, UV printing....etc

Module II

Combine the works of various designing and drawing software. Magazine, book, and journal printing. Research Journal styles and lay out. Referencing styles. End notes, Footnotes, Bibliography, References.

Module III

Digital Printing, Single color, Two color and multi color. Digital publication to digital media.

Module IV

Printing process- functions of press operator - set up and maintain the press. loading, unloading and cleaning the machine. sheet feeding mechanism, sheet controls, sheet insertion and transfer, Gripper, inking system, Multi roller systems, Dampening system, Cylinder adjustments, Delivery mechanism.

Module V

Skills and Proficiencies required for a printing machine operator. Primary responsibilities of printing machine operator. Job Duties and Tasks for: "Job Printer"

BOOKS FOR REFERENCE:

Digital Printing, ABPL Publication

Program- B.VOC	Externnal-40
Branch-DTP & Printing Technology	Internal-10
Semester- V	Total Marks-50
Paper -II	Time-3hours

WEB OFFSET TECHNOLOGY

Module I

Different types of Web-Offset Printing Presses. Construction and configuration – on-line operations such as numbering, perforating, sprocket hold punching and Zig-Zag folding etc.Different types of collators – Roll to Roll pack to pack – Programmable outers for continuous web-MICR cheque binding system. Machines used for packing and Despatch.

Module II

Receiving shipping, waste paper, & trash removal, ware housing and storing, maintenance, production office, flammable solvent storage, ink mixing , storage and pumping. Typical settings to

Vinod Kumar Tiwari
Librarian (Special Duty)

be done on a sheet- fed and web press machine. Facility specification- Prepress area, Sheet fed press room, web offset press room, roll paper storage area, bindery, finishing, mailing & pumping

Module III

Materials control-Establishing clear specifications and standardisation of materials to be purchased. Inspection and testing of incoming materials as part of quality control, importance of proper handling and maintenance of records of performance of materials, Sampling.

Module IV

Preparation of impositions for web offset printing. Film assembly & Platemaking. Cocking the plate. Study of pre-make ready & make ready operations of web offset machine. To obtain single color print from web offset machine. To obtain multi color print from web offset machine.

BOOKS FOR REFERENCE:

Web-Offset Printing Technology, ABPL Pulbications

Program- B.VOC	Externnal-40
Branch-DTP & Printing Technology	Internal-10
Semester-V	Total Marks-50
Paper -III	Time-3hours

TECHNICAL AND SCIENTIFIC DOCUMENTATION

Module I

Introduction to Latex. Installation of the software LaTeX. Understanding Latex compilation Basic Syntex, Writing equations, Matrix, Tables

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Module II

Page Layout – Titles, Abstract Chapters, Sections, Referrences, Equation references, citation. List making environments Table of contents, Generating new commands, Figure handling numbering, List of figures, List of tables, Generating index.

Module III

Packages: Geometry, Hyperref, amsmath, amssymb, algorithms, algorithmic graphic, color, tilez listing.
Classes: article, book, report, beamer, slides. IEEtran.

Module IV

Applications to: Writing Resumae Writing question paper Writing articles/ research papers Presentation using beamer.
Graphics in LaTeX Graphics handling - Generating .jpg files. - Function plotting - Data plotting

Module V

Practical and exercises based on the above concepts.

BOOKS FOR REFERENCE:

The LaTeX Companion (Tools and Techniques for Computer Typesetting), Frank Mittelbach, Addison-Wesley Professional
Scientific documentation in LaTeX, ABPL Pulbications

Program- B.VOC	External-40
Branch-DTP & Printing Technology	Internal-10
Semester-V	Total Marks-50
Paper -IV	Time-3hours

BINDING TECHNOLOGY

Module I

Bookbinding, Objectives of book binding, different types of book bindings. Historical forms of binding. Ethiopian binding. Hand binding and commercial binding.

Module II

Modern commercial binding, Hardcover binding. Punch and bind, Thermally activated binding, Stitched or sewn binding, Paperback binding

Module III

Perfect binding, History, uses, chemicals and rawmaterials used grain direction, spine preparation, adhesives, cover application, coated papers, drawn-on covering, testing.

Module IV

Periodical/Journal Binding, Hardcover and Edition Binding, Perfect Binding (paperback), Saddle Stitch and Loop Stitch, Library Binding, Leather Binding, Sewing, Wire-o Binding and Spiral Binding, Slipcases

Module V

Conservation and restoration of books, manuscripts, documents.

BOOKS FOR REFERENCE:

Bookbinding technology, ABPL Publications

Program- B.VOC	Externnal-75
Branch-DTP & Printing Technology	Internal-75
Semester-V	Total Marks-150
Paper -V	

PROJECT WORK- II

OFFSET PRINT MAGAZINE/BOOK

- Students must do this project individually. And it should be a printed magazine/Book developed in any of the softwares. Project should be done under the guidance and approval of the supervising faculty/faculties. Students have to complete the project within the given time period, and they should keep all the important paper works (abstract, design, layout, data sheet of data collection, pdf file etc.) along with them. Students must submit the finished project along with the required paper works and a comprehensive report, to the Head of the Department, before the day of the project evaluation. The project will be evaluated by the external and internal examiners appointed by the university. Delayed, incomplete submissions will be considered as per the university rules.

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Program- B.VOC	External-80
Branch-DTP & Printing Technology	Internal-20
Semester-VI	Total Marks-100
Paper -I	Time-3hours

ENTERPRENEURSHIP DEVELOPMENT

Module – I

To make the students understand about entrepreneurs and different classifications. Entrepreneur and entrepreneurship - Definition; traits and features; classification; Entrepreneurs; Women entrepreneurs; Role of entrepreneur in Entrepreneurs in India.

Module – II

Create an awareness about EDP. Entrepreneurial development programme concept; Need for training; phases of EDP; curriculum & contents of Training Programme; Support systems, Target Groups; Institutions conducting EDPs in India and Kerala.

Module – III

General awareness about edeutification of project financing new enterprises. Promotion of a venture; opportunity Analysis Project identification and selection; External environmental analysis economic, social, technological an competitive factors; Legal requirements for establishment of a new unit; loans; Overrun finance; Bridge finance; Venture capital; Providing finance in Approaching financing institutions for loans.

Module – IV

To identify different Discuss opportunities in small business. Small business Enterprise - Identifying the Business opportunity in various sectors - formalities for setting up of a small business enterprise - Institutions supporting small business enterprise - EDII (Entrepreneurship Development Institute of India), 0 SLDO (Small Industries Development Organization NSIC (National small Industries Corporation Ltd. (CNSIC) NIESBUD (National Institute for Entrepreneurship and small Business Development) Sickness in small business enterprise causes and remedies.

Module – V

To understand about a project report relating to a small business. Project formulation - Meaning of a project report significance contents formulation planning commissions guidelines for formulating a project report - specimen of a project report, problems of entrepreneurs case studies of entrepreneurs.

BOOKS FOR REFERENCE:

1. Cliffton, Davis S. and Fylie, David E., Project Feasibility Analysis, John Wiley, New York, 1977.
2. Desai A. N., Entrepreneur and Environment, Ashish, New Delhi, 1990.
3. Drucker, Peter, Innovation and Entrepreileurship, Heinemann, London, 1985
4. Jain Rajiv, Planning a Small Scale Industry: A guide to Entrepreneurs, S.S. Books, Delhi, 1984

5. Kumar S. A., Entrepreneurship in Small Industry, Discovery, New Delhi, 1990
6. McCleffand, D. C. and Winter, W. G., Motivating Economic Achievement, Free Press, New York, 1969

Program- B.VOC	Externnal-80
Branch-DTP & Printing Technology	Internal-20
Semester-VI	Total Marks-100
Paper -II	Time-3hours

COSTING FOR PRINTING PRESS

Module I

Basics of Accounting. Double entry system. Concept of debit and credit. Journal, Ledger, P&L a/c and BS.

Module II

Cost Accounting. Elements of Cost. Foxed cost, Variable cost, semi variable cost, marginal cost, overhead cost, production cost.

Module III

Elements of Printing Cost. Paper cost, ink cost, machine cost, operating hours, pre-press cost, post press cost. Good Copy & Bad copy in Printing

Module IV

Labor cost, Factors affecting labor cost, machine hour cost, per unit cost, Job Cost, elements of job cost, Costing and estimating of various jobs.

Module V

Data entry using software. Report generation. Printing of reports. Sending reports by email.

BOOKS FOR REFERENCE:

Printing Press Costs, ABPL Publications

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Program- B.VOC	External-80
Branch-DTP & Printing Technology	Internal-20
Semester-VI	Total Marks-100
Paper -III	Time-3hours

PRINTING PRESS MANAGEMENT SYSTEM

Module I

Quotations, Orders, Customer and order book, its Planning and organizing, Delivery notes, Job Cards, Invoices, Delivery Notes and production control.

Module II

Purchase management solution including Purchase Request, LPO, Delivery Note, Goods return and manage bills. Inventory and stock Management including low stock notification.

Module III

Calculation of the estimate-Paper cost, Machine cost, Operation cost, outsource cost etc. Conversion of Estimates as Quotations and work Orders. Send Quotation by Email

Module IV

Manage work orders and worksheets of customers. Manage Pre-Press and track the assigned work status. Track customer work orders, load of machine, Assign Machine for print by understanding the load of machine. Assign printed sheets to Post-Press and outsource works.

Module V

Generate Invoices by adjusting discounts and advanced payments. Purchase Management Reports , Stock Management Control Panel

BOOKS FOR REFERENCE:

Printing Press Management System, ABPL Publications

Program- B.VOC	Externnal-80
Branch-DTP & Printing Technology	Internal-20
Semester-VI	Total Marks-100
Paper -IV	Time-3hours

OFFSET PLATE MAKING

Module I

Offset-lithography. Offset printing technology. Offset and Digital Printing- difference. Plates for process printing – Molded rubber plates , Photo polymer plates, Plate making from liquid photo polymer, plate making from sheet photo polymer. Flexography. Skills and responsibilities of plate maker.

Module II

CTcP (Computer to Conventional Plate), UV-radiator, reflector, mirror, optics, DMD (digital mirror device), Computer-to-Plate Processes-Material, exposure, development. Format Range, System Configuration, Workflow- Pdf, imposition, separation trapping RIP, plate loader/plate setter processor, Semi automatic/automatic/process free CtP.

Module III

Computer-to-Plate (CtP)- competitive advantages, essentials for the use of CtP, CtP technology, Materials, Equipment and Workflow for Digital Offset Plate Making- Internal Drum Plate Setter Architecture, rotating mirror, Repeat Plate Setter Architecture. Computer-to-Plate Data Flow- Pdf, imposition, RIP, Tiff bitmap, Tiff download, Plate setter.

Module IV

Plate Materials, CtP Exposure Sources, hydrophilic (water accepting) base material, oleophilic (ink accepting) coating materials, Matching of Plate Materials and Exposure, Sensitivity of Plate Materials, Conventional Diazo Plate, Silver Halide Plate, Silver Halide Polyester Plate, Photopolymer Plate (violet), Thermal Plate, Chemistry-free Thermal Plate, Process-less Thermal Plate, Thermal Plate for Waterless Offset,

Module V

Relationship between Plate Sensitivity and Imaging Power, External Drum Plate Setter Architecture, Imaging Raster Data.

Computer-to-Plate quality loop, density control, RIP Calibration.

Computer-to-Plate Imaging, imaging resolution, screen ruling, laser pixel, printing dot, image geometry, External Drum Plate Setter, Flat Bed Plate Setter Architecture.

BOOKS FOR REFERENCE:

Offset Plate Making, ABPL Publications

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Program- B.VOC	
Branch-DTP & Printing Technology	
Semester-VI	
INTERNSHIP-II (Two week)	

INTERNSHIP – II

After the completion of the Sixth semester, students will have to undergo a minimum of two Weeks internship programme in a professional design studio or DTP centre attached to an offset/ web Printing press or flex printing press, or a newspaper company, to understand various aspects in a design production atmosphere.

Students can choose a design studio in India or abroad for their internship. College will provide a certificate to prove their identity. A member of the faculty will supervise the student during their internship.

Studios having the following qualities can be chosen:

a. A minimum of five years" experience in designing field

b. Should have produced a minimum of three popular print designs for the last six months.

At the end of the internship, students should prepare a comprehensive report. The report and the specimens of the work done by the student should be attested by the organization. Student should also produce a certificate of internship from the organization. The report should be neatly typed in A4 size paper and in bound form having not less than 25 pages. A copy of the report has to be submitted to the Department before the commencement of the third semester classes. The department will be conducting an open- viva – voce for each student to evaluate the practical skill acquired by them from the training.

Vinod Kumar Tiwari
Officer on Special Duty (Admin)

Madhepura College, Madhepura

(Affiliated to BNM University, Madhepura)

B.Voc. in Accounting & Taxation (UGC)

B.VOC
In
ACCOUNTING & TAXATION
(UGC)

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

INTRODUCTION

The University Grants Commission (UGC) has launched a scheme on skills development based higher education as part of college/university education, leading to Bachelor of Vocation (B.Voc.) Degree with multiple exits such as Diploma/Advanced Diploma under the NSQF.The B.Voc.programme is focused on universities and colleges providing undergraduate studies which would also incorporate specific job roles along with broad based general education. This would enable the graduates completing B.Voc.to make a meaningful participation in accelerating India's economy by gaining appropriate employment, becoming entrepreneurs and creating appropriate knowledge.

Vinod Kumar Tiwari
Officer on Special Duty (Justice)

Course Structure
Semester-I

Paper	Course Name	G.C./S.C.	Credits	Marks Distribution		Total
				Internal	External	
I	Microeconomics	G.C.	6	20	80	100
II	Business Laws	G.C.	6	20	80	100
III	Principal of Management	S.C.	6	20	80	100
IV	Financial Accounting-1	S.C.	6	20	80	100
V	Business Statistics	S.C.	6	20	80	100

Semester-II

Paper	Course Title	G.C./S.C.	Credits	Marks Distribution		Total
				Internal	External	
I	Microeconomics	G.C.	6	20	80	100
II	Business Mathematics	G.C.	6	20	80	100
III	Marketing Management	S.C.	6	20	80	100
IV	Company Law	S.C.	6	20	80	100
V	Financial Account-II	S.C.	6	20	80	100

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Semester-III

Paper	Course Title	G.C./S.C.	Credits	Marks Distribution		Total
				Internal	External	
I	**Indian Economy**	G.C.	4	20	80	100
II	**Business Communication**	G.C.	4	20	80	100
III	**Human Resource Management**	G.C.	4	20	80	100
IV	**Cost Account**	S.C.	9	20	80	100
V	E-Commerce	S.C.	9	20	80	100

Semester-IV

Paper	Course Title	G.C./S.C.	Credits	Marks Distribution		Total
				Internal	External	
I	**Indian Financial** System	G.C.	6	20	80	100
II	**Management** Accounting	G.C.	6	20	80	100
III	**Information Technology and its Application in Business**	S.C.	6	20	80	100
IV	Taxation-I	S.C.	6	20	80	100
V	**Entrepreneurship**	S.C.	6	20	80	100

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Semester-V

Paper	Course Title	G.C./S.C.	Credits	Marks Distribution		Total
				Internal	External	
I	Taxation-II	G.C.	6	20	80	100
II	Public Finance Taxation	G.C.	6	20	80	100
III	Corporate Accounting	G.C.	6	20	80	100
IV	Auditing and Assurance	G.C.	6	20	80	100
V	Financial Management	G.C.	6	20	80	100

Semester-VI

Paper	Course Title	G.C./S.C.	Credits	Marks Distribution		Total
				Internal	External	
I	Computerized Accounting System and E-Filing of Return	S.C.	6	20	80	100
II	Direct Tax Law and Practice	S.C.	6	20	80	100
III	ICT (Practical)	S.C.	6	40	60	100
IV	Project Work	S.C.	6	75	75	150
V	Viva	S.C.	6			50

- G.C. – General Component
- S.C. – Skill Component

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

SEMESTER -I

Paper-I

Microeconomics

Time -3hours

Marks-100

(External-80)

(Internal-20)

Unit:I Demand and Consumer behavior

Concept of demand, demand function, law of demand, derivation of individual and market demand curves, shifting of the demand curve; elasticity of demand.

Consumer behavior: Marshallian utility approach and Indifference Curve approach; utility maximization conditions. Income-Consumption Curve (ICC) and Price-Consumption Curve (PCC): Derivation of demand curve from PCC.

Unit: II Production and Cost

Production function: Short-run and Long-run; Relation among Total Product, Average Product and Marginal Product, Law of returns to a variable factor, Law of Returns to Scale; Concepts of Iso-quant and Iso-cost line; Conditions for optimization (graphical approach).

Cost: Accounting and Economic Costs; Social and Private Costs; Short-run and Long-run Costs; Relation between Average and Marginal Costs; Determination of LAC curve from SAC curves, LMC.

Unit:III Perfect Competition

Concept of perfectly Competitive market: Assumptions, Profit maximization conditions; Related concepts of Total Revenue, Average Revenue and Marginal Revenue, Short-run and Long-run Equilibrium of a firm; determination of short-run supply curve of a firm, measuring producer surplus under perfect competition, Stability analysis Walrasian and Marshallian, demand-supply analysis including impact of taxes and subsidy.

Suggested Readings

- Pindyke and Rubinfeld, Micro Economics, Pearson
- Gould & Ferguson, Micro Economic Theory
- Banerjee & Majumdar, Business Economics and Business Environment, ABS
- Dwivedi, D.N., Managerial Economics, Vikash Publications
- Mankiw.N.G., Principles of Microeconomics, Cengage
- Das, P. & Sengupta A., Economics, Oxford
- Samuelson & Nordhaus, Macroeconomics, McGraw Hill

Vikas Kumar Tiwari
Officer on Special Duty (Justice)

SEMESTER -I

Paper-II

Business Laws

Time -3hours

Marks-100

(External-80)

(Internal-20)

Unit I: The Indian Contract Act, 1872

a). Contract – meaning, characteristics and kinds, Essentials of a valid contract

b). Offer and acceptance (Definition, Rules, Communication and Revocation of offer and acceptance)

c). Consideration (Definition, Elements, Types, Rules), "No Consideration No Contract" and its exceptions; Capacity to Parties (Definition and Types)

d). Consent, Free consent, Coercion, Undue influence, Fraud, Misrepresentation, Mistake

e). Legality of objects and Consideration

f). Void and Voidable agreements – Definition, Types and Distinction

g). Discharge of a contract – Modes of discharge, Breach and Remedies against breach of contract

h). Specific Contracts – Contigent contracts, Quasi, Contract of Indemnity, Guarantee, Bailment,Pledges

Unit II: The Sale of Goods Act, 1930

a). Contract of sale, meaning and difference between sale and agreement to sell

b). Condition and warranties

c). Transfer of ownership in goods including sale by a non-owner

d). Unpaid seller – meaning, rights of an unpaid seller against the goods and the buyer

Unit III: Partnership Laws

A. The Partnership Act, 1932

a). Definition – Partner, Partnership

b). Nature and Characteristics of Partnership

c). Types of Partners

d). Registration of a Partnership Firms and consequences of non-registration

e). Rights and Duties of Partners

f). Dissolution of firms – meaning and grounds

B. The Limited Liability Partnership Act,2008

a) Definition

b) Salient Features of LLP

c) Advantages and disadvantages of LLP

d) Difference between: LLP and Partnership, LLP and Company

e) Incorporation of LLP

Unit 4: The Negotiable Instruments Act 1881

a) Definition, Features, Types, Parties of Negotiable Instruments: Promissory Note, Bill of exchange, Cheque (Definition and Types)
b) Endorsement: Types of Endorsement
c) Holder and Holder in Due Course, Privileges of Holder in Due Course.
d) Dishonour of Negotiable Instruments: Modes, Consequences, Notice of Dishonour; Noting and Protesting
e) Discharge of Negotiable Instruments: Meaning and Modes

Unit 5: Consumers Protection Act,1986

a) Objectives and features of Consumers Protection Act
b) Definition – Complainant, Complaint, Consumer, Consumer Dispute, Defect, Deficiency, District Forum, Person
c) Unfair trade practices
d) Consumer Protection Council (Central, State and District – their constitutions and objectives)
e) Consumer Dispute Redressal Agencies: Composition and jurisdiction of District forum, State Commission and National Commission

[If any new provisions are enacted in place of the existing provisions, the syllabus will accordingly include such new provisions in placen of existing provisions with effect from such date as prescribed by Calcutta University. Similarly if any existing provision becomes redundant due to changes, it will be left out of the syllabus]

Suggested Readings :

- Kumar Ravindra, **Legal Aspects of Business, Cengage**
- Tulsian & Tulsian, **Business Laws, S.Chand**
- Kapoor N.D., **Business Regulatory Framework, OUP**
- Gulsan S.S., **Business Laws, Excel Books**
- Roychowdhury, Bhattacharjee & Datta, **Business Regulatory Framework, Elegant Publishers**
- Bhadra, Satpati and Mitra, **Ainer Ruprekha (Bengali Version), Dishari**

SEMESTER -I

Paper-III

Principles of Management

Time -3hours

Marks-100

(External-80)

(Internal-20)

Unit-1: Introduction:

Management-definition, importance, functions, nature-as profession, science and art, universality of management; levels of management; managerial tasks and skills.

Different Schools of Thoughts: Classical School-contributions of Taylor and Henri Fayol; Neo-classical school-Human Relations approach and Behaviour Science Approach; Modern School; System approach and Contingecy approach.

Unit-2: Planning:

Concept, importance, steps, types, premises, barriers to effective planning and remedial measures; strategic planning-concept forecasting – concept, techniques.

Unit-3: Organizing:

Concept, importance, principles, different organization models-line and staff; Functional; Departmentation-need, basis, principles, Delegation of Authority-elements, steps barriers; Centralization and Decentralization of Authority; Span of Management; concept and determining factors.

Unit-4: Directing and Staffing:

Directing: concepts, importance of directing. Leadership: Concept, importance, types, leadership traits, Tannenbaum &Schmidt's Model and Blake & Mouton's Model.

Staffing: concepts, importance

Unit-5: Motivation, Co-ordination and Control:

Motivation: Concept, importance, importance of need theory, and contributions of McGregor,Maslow, Herzberg.

Coordination: concepts, importance, principles and implementation techniques.

Control: concepts, importance and tools of control.

Suggested Readings

- Kaul, Principle and Practice of Management, Vikash
- Koontz & Weirich, Essentials of Management, TMH

- Koontz, Weirich&Cannice, Management, McGraw Hill
- Stoner & Freeman, Management, PHI
- Drucker,P.F., Managing Challenges for the 21st Century, Butterworth, Oxford
- Mitra, J., & Somani, N., Principles of Management and Business Communications, Oxford

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

SEMESTER -I

Paper-IV

FINANCIAL ACCOUNTING – 1

Time -3hours

Marks-100

(External-80)

(Internal-20)

Unit	Topic	Details
1	Introduction	• Nature of accounting. Users of accounting information. • Double entry book keeping system – Basic accounting equation, meaning of assets, liabilities, equity, revenue and expenses. Accounting Cycle – Recording of transaction: Journal, Ledger and preparation of Trial Balance • Bases of accounting; cash basis and accruals basis. • Basic concepts and conventions: entity, money measurement, going concern, cost, realization, accruals, periodicity, consistency, prudence (conservatism), materiality, matching and full disclosures.
2	Concepts for determination of business income	• Revenue recognition: Meaning of revenue; objective; timing of recognition. Recognition of expenses. • Inventories: meaning, Significance of inventory valuation, Lower of cost or market rule; Inventory ascertainment and reconciliation. • The nature of depreciation. The accounting concept of depreciation. Factors in the measurement of depreciation. Methods of computing depreciation: straight line method and diminishing balance method; Disposal of depreciable assets; change in estimate and method of charging depreciation, asset provision. • Reserves and provisions: Meaning; Objective; Types & Accounting
		• Capital and revenue expenditures and receipts: general introduction only • Adjustment and rectification
3	Introduction to Accounting Standard	Financial accounting standards: concept, benefits, procedure for issuing accounting standards in India. Need for a global standard, IFRS (concept only).
	Introduction to accounting Theory	Concept of accounting theory; relation with practice; GAAP; Capital – capital maintenance concepts; Limitations of Historic Cost accounting; Introduction to

		Fair Value accounting
4	Final accounts of Trading concern	Preparation of financial statements: of sole proprietorship business entities from a trial balance – Manufacturing, Trading, P/L A/c and Balance Sheet
5	Financial statements from incomplete records and of NPO	Preparation of financial statements: a) From incomplete records b) Of non-profit organization
6	Accounting for special sales transaction	▪ Consignment: Basic features; difference with sales. Recording in the books of Consignor – at cost & at invoice price, Valuation of unsold stock; Ordinary commission. Treatment and valuation of abnormal & normal loss. Special commission; Del credere commission (with and without bad debt) – use of Consignee • Accounting for sale on approval

Relevant Accounting Standards issued by the Institute of Chartered Accountants of India are to be followed.

Suggested Reading:

- Shukla, Grewal, Gupta: Advanced Accountancy Vol. I, S Chand
- R. L. Gupta & Radhaswamy, Advanced Accountancy Vol I, S. Chand
- Maheshwari & Maheshwari, Advanced Accountancy Vol. I, Vikash Publishing House Pvt. Ltd.
- Sehgal & Sehgal, Advanced Accountancy Vol. I, Taxman Publication
- B. Banerjee, Regulation of Corporate Accounting & Reporting in India, World Press.
- Hanif & Mukherjee, Financial Accounting, McGraw Hill
- Frank Wood, Business Accounting Vol I, Pearson
- Tulsian, Financial Accounting, Pearson
- Mukherjee and Mukherjee, Financial Accounting I, Oxford
- Accounting Standards issued by ICAI

SEMESTER -I

Paper-V

Business Statistics

Time -3hours

Marks-100

(External-80)

(Internal-20)

1. **Correlation and Association:** Bivariate data, Scatter diagram, Pearson's correlationcoefficient, Spearman's rank correlation, Measures of association of attributes.
2. **Regression Analysis:** Least squares method, simple regression lines, properties of regression, Identification of regression lines.
3. **Index Numbers:** Meaning and types of index numbers, Problems of constructing index numbers, Construction of price and quantity indices, Test of adequacy, errors in index numbers, Chain base index numbers; Base shifting, Splicing, Deflating, Consumer price index and its uses.
4. **Time Series Analysis:** Causes of variation in time series data, Components of time series, additive and multiplicative models, Determination of trend by semi-average, moving average and least squares (of linear, quadratic and exponential trend) methods; Computation of seasonal indices by simple average, ratio-to-moving average, ratio-to-trend and link relative methods; Simple forecasting through time series data.
5. **Probability Theory:** Meaning of probability; Different definitions of probability; Conditional probability; Compound probability; Independent events, Simple problems.

Suggested Readings

- Business Mathematics and Statistics- N G Das & J K Das (Tata McGraw Hill)
- Statistics for Business Decisions – J. K. Das (Academic Publishers)
- Basic Mathematics and its Application in Economics – S. Baruah (Macmillan)
- Mathematics for Economics and Business – R. S. Bhardwaj (Excel Books)
- Mathematics and Statistics for Management – K B Akhilesh and S Balasubrahmanyam (Vikash Publishing House Pvt. Ltd.)
- Business Statistics – G. C. Beri (Tata McGraw Hill)
- Fundamentals of Statistics – S. C. Gupta (Himalaya Publishing House)
- Statistics for Business and Economics – D.R. Anderson, D.J. Sweeney and T.A. Williams (Thomson Asia Pvt Ltd)
- Text Book of Business Mathematics, Padmalochan Hazarika, S. Chand

Vikash Kumar Tiwari
Officer on Special Duty (Judicial)

- Business Mathematics, Jameeruddin, Khanna & Bhamdri, Vikash
- Business Mathematics & Statistics – J. Chakraborti (Dey Book Concern)
- Business Mathematics & Statistics – R K Ghosh & S Saha (New Central Book Agency (P) Ltd
- Rajaretnam, Statistics for Social Sciences, Sage
- Elementary Business Mathematics & Statistics – Dr. Prirotosh Khan (Elegant Publication)
- Business Mathematics & Statistics – Dr. S N De (Chhaya Prakashani)
- Business Mathematics & Statistics – N K Nag & S K Nag (Kalyani Publishers)
- Business Mathematics & Statistics – Dr. Ranjit Dhar (Dishari Prakashani)

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

SEMESTER -II

Paper-I

Macroeconomics

Time- 3 hours

Marks-100

(External-80)

(Internal-20)

Unit I : Introduction

Concepts and variables of Macroeconomics.

Unit II : National Income Accounting

Concept and measurement of National Income (numerical examples preferred); Circular flow of income – Real and Nominal GDP – Implicit deflator.

Unit III : Determination of Equilibrium Level of National Income

Simple Keynesian Model; Consumption, saving and investment functions – National income determination; Investment multiplier, Government expenditure multiplier, Tax multiplier, Balanced Budget multiplier.

Unit IV : Commodity market and Money market equilibrium

Concept of demand for money: Liquidity Preference Approach; Derivation of IS and LM curves –Shifts of IS and LM curves-equilibrium in IS-LM model – Effectiveness of monetary and fiscal policies.

Unit V : Money, Inflation and Unemployment

Concept of supply of money; Measures of money supply – High powered money – Money multiplier. Concept of Inflation – Demand–pull and Cost-push theories of inflation – Monetary and fiscal policies to control inflation; Unemployment: Voluntary and Involuntary, Frictional and Natural Rate of Unemployment (Concepts only).

Suggested Readings

- W. H. Branson, Macro Economic Theory and Policy
- Joydeb Sarkhel, Macro Economic Theory
- Mazumdar & Chatterjee, Macroeconomics & Advanced Business Mathematics, ABS
- Dornbusch, Fischer & Startz, Macroeconomics, TMH
- Samuelson & Nordhaus, Macroeconomics, McGra

SEMESTER -II

Paper-II

Business Mathematics

Time -3hours

Marks-100

(External-80)

(Internal-20)

1. **Permutations and Combinations:** Definition, Factorial Notation, Theorems on Permutation, Permutations with repetitions, Restricted Permutations; Theorems on Combination, Basic Identities, Restricted Combinations.
2. **Set Theory:** Definition of set, Presentation of sets, Different types of sets – Null set, Finite and Infinite Sets, Universal set, Subset, Power setetc.; Set Operations, Law of algebra of Sets.
3. **Binomial Theorem:** Statement of the theorem for positive integral index, General term, Middle term, Simple properties of binomial coefficients.
4. **Logarithm:** Definition, Base and Index of Logarithm, General properties of Logaritm, Common Problems.
5. **Compound Interest and Annuities:** Simple AP and GP Series, Different types of interest rates, Net present value, Types of annuities, Continuous compounding, Valuation of simple loans and debentures, Problems relating to Sinking Funds.
6. **Functions, Limit and Continuity :** Definition of functions, Classification of functions, Different types of functions (excluding trigonometrical functions), Elementary ideas of limit and continuity through the use of simple algebraic functions.
7. **Differentiation and Integration :** Derivative and its meaning; Rules of differentiation; Geometrical interpretion; Significance of derivative as rate measure; Second order derivatives; Integration as anti-derivative process; Standard forms; Integration by substitution.
8. **Applications of Derivative and Integration :** Maximum and minimum values; Cost function; Demand function, Profit function; Increasing and decreasing functions; Rate measure, Appled problems on Average cost (AC), Average variable cost (AVC), Marginal cost (MC), Marginal revenue (MR), Simple area calculation by integration method.
9. **Determinants :** Determinants upto third order, Elementary properties of determinants, Minors and co-factors, Solution of a system of linear equations by Cramer's Rule (up to three variables).
10. **Matrix :** Defination of matrix, Types of matrices, Operations on matrices (addition, subtraction, multiplication), Adjoint of a matrix, Inverse of a matrix, Solution of a system of linear equations by matrix inversion method (up to three variables).

Suggested Readings

- Basic Mathematics and its Application in Economics – S. Baruah (Macmillan)
- Mathematics for Economics and Business – R. S. Bhardwaj (Excel Books)
- Mathematical Analysis for Economists – R. G. D. Allen(Macmillan)

- Mathematics for Management – M. Raghavachari (Tata McGraw-Hill)
- Mathematics for Business, Economics and Social Science – F. S. Budnick (Tata McGraw Hill)
- Advanced Business Mathematics – J. Chakraborti (Dey Book Concern)
- Advanced Business Mathematics – R K Ghosh & S Saha (New Central Book Agency (P) Ltd
- Advanced Business Mathematics – Dr. Priyotosh Khan (Elegant Publication)
- Advanced Business Mathematics - Dr. S N De (Chhaya Prakashani)
- Advanced Business Mathematics – N K Nag & S K Nag (Kalyani Publishers)
- Advanced Business Mathematics – Dr. Ranjit Dhar (Dishari Prakashani)

SEMESTER -II

Paper-III

Marketing Management

Time -3hours **Marks-100**

(External-80)

(Internal-20)

Unit 1: Introduction:

Nature, scope and importance of marketing; Selling vs Marketing mix, Marketing environment: concept, importance, and components (Economic, Demographic, Technological, Natural, Socio-Cultural and Legal).

Unit 2: Consumer Behaviour and Market segmentation:

Consumer Behaviour: Nature and importance, Factors influencing consumer buying behavior. Market segmentation: concept, importance and bases; Product differentiation vs. market segmentation.

Unit 3: Product:

Concept and importance, Product classifications; Concept of product mix; Branding, packaging and labeling; Product life-cycle; New Product Development Process.

Unit 4: Pricing, Distribution Channels and Physical Distribution

Pricing: Significance, Factors affecting price of a product. Pricing policies and strategies. Distribution Channels and Physical Distribution: Channels of distribution – meaning and importance; Types of distribution channels; Factors affecting choice of distribution channel.

Unit 5: Promotion and Recent developments in marketing:

- Sehgal & Sehgal, Advanced Accountancy Vol. I & II, Taxman Publication
- L.S.Porwal, Accounting Theory, Tata Mcgraw Hill
- Gokul Sinha, Accounting Theory & Management Accounting,
- B.Banerjee, Regulation of Corporate Accounting & Reporting in India, World Press.
- Frank Wood, Business Accounting Vol I & II, Pearson
- Tulsian, Financial Accounting, Pearson
- Hanif & Mukherjee, Financial Accounting, Vol II, McGRaw Hill
- Accounting Standards issued by ICAI

SEMESTER -III

Paper-I

Indian Economy

Time-3hours

Marks-100
(External-80)
(Internal-20)

Unit I : Basic Issues in Economic Development

Concept and measures of development and underdevelopment; Concept of national income: GDP, GNP, NDP, NNP, NI (concept only).

Unit II : Basic Features of Indian Economy

Sectoral distribution of National Income and Occupational Structure; Structural Change in Indian Economy. Issue of Service-led Growth.

Unit III : Sectoral Trends and Issues

(a) **Agricultural Sector** : Problem of low productivity; Green Revolution and its impact; Land Reforms: Problems of rural credit and marketing.

(b) **Industry and Service Sector** : An overview of industrial growth during pre-reform and post-reform

Period; Role of Public Sector: its performance and the issue of disinvestment; Role of MSME sector, problems faced by the MSME Sector; Role of the Service Sector: growth of banking and insurance sector during the post-reform period.

(c) **External Sector** : Problem of unfavourable balance of payments and policy measures.

Vinod Kumar Tiwari
Officer on Special Duty (Statistics)

Unit IV : Social Issues in Indian Economy

Problem of Poverty, Poverty alleviation measures; Problem of Unemployment and the policy measures.

Suggested Readings

- Dutt & Sundaram, Indian Economy, S. Chand
- Mishra & Puri, Indian Economy, Himalaya Publishing House
- Uma Kaplia, Indian Economy
- Joydeb Sarkhel & Swapan Kr. Roy, Bharoter athanaiti
- Banerjee & Majumdar, Business Economics and Business Environment, ABS
- Banerjee & Majumdar, Banijjik Arthaniti –o- Banijjik Paribesh, ABS
- Ratan Khasnabish & Ranesh Roy, Banijjik Arthaniti –o- Bharoter arthanitik Paribesh
- Prakash, B.A., Indian Economy, Pearson
- Fernando, Indian Economy, Pearson

SEMESTER -III

Paper-II

Business Communication

Time-3hours

Marks-100
(External-80)
(Internal-20)

Unit 1: Introduction

Definition, objectives, importance, elements, process, forms, models, principles of effective communication in conflict resolution

Unit 2: Types of Communication

Formal and informal communication, Grapevine, Characteristics of corporate communication, Characteristics of corporate communication, Communication network

Unit 3: Tools of Communication

Emergence of communication technology, Modern Forms of communication, Fax, E-mail, Video Conferencing

Unit 4: Drafting

Notice, Circular, Resolution & Minutes, Report, CV writing, Business letter writing- Offer letter, Quotation, Status enquiry, Confirmation, Execution, Refusal and cancellation of order, Recommendation, Credit collection, Claim, Bank loan

Suggested Readings

- Anjanee, S. & Bhavana Adhikari, Business Communication, TMH
- Chaturvedi & Chaturvedi , Business Communication : Concepts, Cases and Applications, Pearson
- M.K.Shegal & Vandana Khetarpal, Business Communication, Excel Books
- R.K.Madhukar, Business Communication, Vikash Publishing House Pvt. Ltd.

SEMESTER -III
Paper-IV
Cost Account

Time-3hours

Marks-100
(External-80)
(Internal-20)

Unit	Topic	Content
1.	Introduction	• Defining of Costing, Objectives of Cost Accounting; Management Accounting and difference with Cost Accounting; Installing a Cost Accounting System, Essentials of a good Cost Accounting System. • Cost Concepts, terms and classification of costs: Cost, Cost object, Cost units and Cost Centres, Types of costs, classification of costs- Direct-Indirect, Elementwise, Functionwise, Behaviourwise, Sunk Cost. Costing Methods and Techniques (introduction only).
2.	Material Costs	• Purchase of materials: Organisation, purchase procedure, documentation, determination of material purchase costs. • Storage of materials: Need for storage, location and types, functions of a storekeeper, requisition, receipt, issue and transfer of materials, storage record, accounting for materials cost. • Materials control: Organisation; Tools; Just-in-Time Purchase; various stock levels, Economic Ordering Quantity and ABC Analysis; Periodic Inventory, Perpetual Inventory, Physical verification; Discrepancies in stock and their treatment. • Methods of Pricing Material Issues: FIFO, LIFO, and Weighted Average. • Treatment of Normal and Abnormal Loss of Materials
		• Introduction, Recording labour cost: Attendance and payroll procedures (Time-keeping, Time-Booking, Payroll procedure, Payment of wages-Piece rate, differential piece rate, time rate); Idle time (causes and treatment in Cost Accounting), Overtime (its effect and treatment in Cost Accounting), Labour turnover (Causes, impact and methods of calculating labour turnover). • Main Principles for sound system of wage incentive schemeslabour utilization; System of Wage Payment and Incentives (Halsey, Halsey-weir, Rowan and Emerson • System of Incentive Schemes for Indirect Workers; Component of wages

3.	**Employee Cost and Incentive Systems**	cost for costing purpose.
4.	**Overhead and Cost Statement**	**Overhead** • Introduction: Definition, Classification of Overhead-Functional and Behavioural. • Manufacturing Overheads: Allocation and apportionment of Overhead; Absorption of Overhead; various methods and their application; Treatment of under absorption/over absorption of overheads. • Administration and Selling & Distribution Overheads and their charging: an introduction only • Preparation of Cost Sheet and estimation

5.	**Cost Book-keeping**	**Cost Book-keeping** • Non-Integrated System: Meaning & Features; Ledgers Maintained; Accounts prepared; General/Cost Ledger Adjustment Account; Meaning of Closing Balance in Various Accounts; Disadvantages. • Reconciliation: Need of reconciliation; Items causing differences between Cost and Financial Profits and their reconciliation.
6.	**Costing Methods**	• **Job Costing** (Job cost cards and databases, Collecting direct costs of each job, Attributing overhead costs to jobs, Applications of job costing). **Batch Costing** • **Contract Costing** – Progress payments, Retention money, Escalation clause, Contract accounts, Accounting for material, Accounting for plant used in a contract, Contract Profit and Balance sheet entries. • **Service Costing and Output Costing**- Introduction; Motor Transport Costing only • **Process Costing** : Meaning, Features, Process vs Job Costing, Principles of cost ascertainment for Materials, Labour & Overhead; Normal loss, Abnormal loss and gain and preparation of process accounts. Inter-process profit (simple cases). Valuation of WIP and Equivalent units (excluding Intermediary process).

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Suggested Readings

- Horngren, Datar & Rajan, Cost Accounting, - A Managerial Emphasis, Pearson
- B.Banerjee, Cost Accounting, PHI
- Jawahar Lal & Seema Srivastva, Cost Accounting, TMH
- Bhattacharyya, Ashish K., Cost Accounting for Business Manageres, Elsewer
- Ravi M Kishore, Cost Accounting, Taxman
- Mitra, J.K., Cost Accounting, Oxford
- Hanif, M., Cost Accounting, McGraw Hill
- Drury, Colin Cost Accounting, Cengage
- Satish Inamdar, Cost Accounting, Everest Publishing House
- Bhattacharyya, Ashish K., Cost Accounting for Business Manageres, Elsevier
- Ravi M Kishore, Cost Accounting, Taxmann

SEMESTER -III

Paper-V
E-Commerce

Time-3hours

Marks-100
(External-80)
(Internal-20)

Unit 1: Introduction

E-Commerce – meaning, nature, concepts, types, e-commerce **business models B2B [concept, major** activities, types of B to B market (independent, buyer oriented, supplier oriented. e-market place)], B2C [portals, e-tailer, content provider, transaction broker, **real life examples of B2C], C2C, C2B, etc.; forces behind e-commerce, e-Governance [meaning, types, significance, real life examples].**

Unit2: E-CRM and SCM

E-CRM-definition, features, goals of E-CRM business framework, **phase of E-CRM,** types **of E-CRM, Functional components of E-CRM, strategies for E-CRM solutions; SCM-definition, features, types of supply chain.**

Unit 3: Digital Payment

Methods of e-payments [Debit Card, Credit Card, Smart Cards, e-Money], electronic or digital wallet, digital signature (producers, working and legal provisions), payment gateways (Core Banking Solution or CBS, Mobile Payment, UPI, NCPI, International Payments], Online banking (meaning, concepts, importance, electronic fund transfer, automated clearing house, automated ledger posting), risks involved in e-payments.

Unit 4: ERP

Defination, features, major characteristics, levels of ERP, benefits of ERP, enterprise potential of ERP, modules of ERP, phase of ERP implementation, limitations of ERP.

Unit 5: New Trends in E-Commerce

Social Commerce-concept, definition, features; Digital Marketing-definition, objectives, methods, limitations; Advertisement in Social Media-objectives, advantages and disadvantages, procedures

Suggested Readings

- P.T. Joseph, E-Commerce: An Indian Perspective, PHI Learning
- Henry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang, E-Commerce: Fundamentals and Applications, Wiley.
- Laudon, E-Commerce, Pearson Education India
- Schneider G., E-Business, Cengage
- Bhaskar, B., E-Commerce, McGraw Hill

SEMESTER -IV

Paper-I

Indian Financial System

Time-3hours

Marks-100
(External-80)
(Internal-20)

Unit I : Financial System and Its Components
Meaning, Significance and Role of the Financial System; Components of the Financial System; The structure of Indian Financial System.

Unit II : Financial Markets
(a) Money Market : Functions and Instruments; Role of Central Bank; Indian Money Market: An Overview, Call Money Market, Treasury Bills Market, Commercial Paper (CP) Market, Certificate of Deposite (CD) Market; Concepts- Repo, Reverse Repo; Recent trends in the Indian money market.

(b) Capital Market: Functions and Instruments; Primary and Secondary Markets- Functions ans inter-relationship, Methods of New Issues; Indian debt market and equity market; Market Intermediaries- Brokers, Sub-Brokers; Role of Stock Exchanges in India; Recent trends in the Indian capital market.

Unit III : Financial Institutions

Commercial banking: Functions of Commercial Banks, Credit creation by commercial banks and its limitations; Reserve bank of India: Functions, Credit Control and Monetary Policy; Development Financial Institutions in India: NABARD, EXIM Bank, SIDBI; Life Insurance and General Insurance Companies in India: Functions; Mutual Funds: Concept of Mutual Fund, Types of Mutual Funds (open ended and close ended); Role of Mutual Funds in Indian capital market; Non-Banking Financial Companies (NBFCs): Definition, Functions, Regulations of RBI over NBFCs.

Unit IV : Financial Services

Merchant Banks: Functions and Role, SEBI Regulations; Credit Rating: Objectives and Limitations, SEBI Regulations; Credit Rating Institutions and their functions.

Unit V : Investors' Protection

Concept of investors' protection; Grievances regarding new issue market and Stock Exchange transactions, and the Grievance Redressal Mechanism; Role of SEBI, judiciary and the media.

Suggested Readings

- Khan, M.Y., Indian Financial System – Theory and Practice, TMH
- Bhole, L. M., Financial Markets and Institutions, TMH
- Majumder S., Indian Financial System
- Nayak and Sana, Indian Financial System, Rabindra Library
- Basu, A, Mazumdar, D, Datta S., Indian Financial System, ABS
- Gurusamy, Financial Services, TMH
- Pathak, B., Indian Financial System, Pearson
- Bhattacharyya S., Indian Financial System, Oxford University Press
- Saha, S.S., Indian Financial System and Markets, McGraw Hill
- Saha, S.S., Capital Markets and Securities Law, Taxmann

Vinod Kumar Tiwari

SEMESTER -IV

Paper-II
Management Accounting

Time-3hours

Marks-100
(External-80)
(Internal-20)

*Unit 1: **Introduction to Management Accounting:***
Meaning, Features, Scope, Importance, Functions, Differences between Financial accounting, Cost accounting and Management accounting

*Unit 2: **Budgetary Control:***
Meaning, Characteristics, Objectives, Steps, Advantages, Limitations, Types of budgets

*Unit 3: **Standard Costing:***
Meaning, Advantages, Limitations, Preliminaries, Steps in setting up of standard costs, Differences between Budgetary control and standard costing, Estimated cost

*Unit 4: **Variance Analysis:***
Meaning, Favourable and Unfavourable variances, Controllable and uncontrollable variances, Uses of variances, Analysis of variances, Types of variances

*Unit 5: **Marginal Costing:***
Meaning, Features, Advantages, Limitations, Absorption costing

*Unit 6: **Cost - Volume – Profit Analysis:***
Contribution, Break even analysis, Profit Volume Ratio, Margin of safety

*Unit 7: **Analysis and Interpretation of Financial Statements:***
Meaning, Steps, Objectives, Types of Analysis, Comparative financial statement, Common size financial statement, Trend Analysis

*Unit 8: **Ratio Analysis:***
Meaning, Advantages, Limitations, Classifications of ratios

*Unit 9: **Working Capital Management:***
Meaning of working capital, Kinds of working capital, Sources of working capital, Objectives of working capital management, Determinants of working capital requirement, Estimation of working capital requirement

*Unit 10: **Fund Flow Statement:*** Meaning, Uses, Limitations, Sources and uses of funds

*Unit 11: **Cash Flow Statement:***

Meaning, Uses, Limitations, Sources and uses of cash

SEMESTER -IV

Paper-III

Information Technology and its Application in Business

Total Mark-100

(External -80) ,

(Internal-20)

Unit 1: Information Technology

Concept of data, information and computer based information system, impact of information technology on business [business data processing, intra-organizational and

inter-organizational communication by using network technology, business process outsourcing and knowledge process outsourcing], types of Information System- Transaction Processing System (TPS), Management Information System (MIS), Decision Support System (DSS), Knowledge Management System (KMS) and their implementation at managerial levels [operational, tactical and strategic].

Unit 2: Data Organization and Data Base Management System

(a) Data Organization: Character, field, record, file and database, types of data processing systems [Serial, Batch, Real-time, Online, Centralized, Distributed], File Organizations [Sequential, Direct, Indexed-Sequential, Relative], Traditional file organization vs. Database file organization.

(b) Database Management System: Concept of database management system (DBMS), definition, importance of DBMS, important terms of database [Entity, Attribute, Keys- Primary, Foreign and Candidate, Referential Integrity, Table, Views, Data Dictionary], types of database [Hierarchical, Network and Relational], basic ideas of Data Warehouse and Data Mining (definition, importance, advantages and disadvantages), Big data analysis-Concept.

Unit 3: Internet and Its Applications

Meaning of Internet, IPAddress (IPv4, IPv6], URL, Domain Name System, Internet Protocols – TCP/IP, UDP, FTP, TELNET(brief ideas only], HTML, DHTML AND XML (Concepts only], Ethical Hacking, Cloud Computing, Mobile Computing, Internet of Things, Ethical issues in Social Networking.

Unit 4: Security and Encryption

Need and concepts, dimension, definition and scope of e-security, security threats- Malicious Codes (Virus, Trozan Horse, Worm, Spyware, Ransomware], Hacking, Sniffing, Phising, Apamming, Denial of Service (DoS) attacks, Technology solutions (Confidentiality: (Data Encryption & Decryption, Symmetric and asymmetric encryption), Security Implementation: Firewall, DMZ (De Militarized Zone), SSL, HTTPs, Significance of Website Auditing].

Unit 5: IT Act. 2000 and Cyber Crimes

IT Act 2000- Definitions of different terms, Digital signature, Electronic Governance, Attribution, Acknowledgement and Dispatch of Electronic Records, Regulation of Certifying Authorities, Digital Signatures Certificates, Duties of Subscribers, Penalties and Adjudication, Appellate Tribunal, Offences and Cyber-crimes.

Vinod Kumar Tiwari
Officer on Special Duty (Academic)

SEMESTER -IV
Paper-IV
Taxation-I

Time-3hours

Marks-100
(External-80)
(Internal-20)

Unit I :

a) **Basic Concepts and Definitions under IT Act**
Assenssee, Previous year, Assessment year, Person, Income, Sources of income, Heads of income, Gross total income, Total income, Maximum marginal rate of tax, Tax Evasion, Tax avoidance, Tax planning.

b) **Residential Status and Incidence of Tax**
Residential status of all persons except company

c) **Incomes which do not form part of Total Income**
Except section 10AA.

d) **Agricultural Income**
Definition, determination of agricultural and non-agricultural income, assessment of tax liability when there are both agricultural and non-agricultural income

Unit II : **Heads of Income and Provisions governing Heads of Income**

a) Salaries

b) Income from House property

Unit III : **Heads of Income and Provisions governing Heads of Income**

a) Profits and Gains of Business and Profession
Special emphasis on sec. 32, 32AC, 32AD, 35, 35D, 36(i)(ib), (ii), (iii), (iv), (vii), 37, 37(2B), 40A(2), 40A(3), 43B, (Excluding presumptive taxation)

b) Capital Gains
Meaning and types of capital assets, basic concept of transfer, cost of acquisition, cost of improvement and indexation, computation of STCG and LTCG, exemptions u/s 54, 54B, 54EC, and 54F, capital gain on transfer of bonus shares, right entitlement and right shares, taxability of STCG and LTCG.

c) Income from Other Sources
Basis of charge excluding deemed dividend

Unit IV :

a) **Income of other Persons included in Assessee's Total Income**
Remuneration of spouse, income from assets transferred to spouse and Son's wife, income of minor.

b) **Set off and Carry Forward of Losses**
Mode of set off and carry forward, inter source and inter head set off, carry forward and set off of losses u/s 71B, 72, 73, 74, 74A.

c) **Deductions from Gross Total Income**
Basic concepts, deductions u/s 80C, 80CCD, 80CCE, 80D, 80DD, 80DDB, 80E, 80G, 80GG, 80GGC, 80TTA, 80U

d) Rebate u/s 87A

Suggested Readings

- Singhnia V.K., and Singhania K, Direct Tax Law and Practice, Taxmann
- Lal and Vashist, Direct Taxes, Pearson
- Ahuja and Gupta, Direct Taxes Law And Practice, Bharat
- Manoharan & Hari, Direct Tax Laws, Snow White
- Roy, S. K., Principles and Practice of Direct & Indirect Taxes, ABS
- Roy, S.K., Principles and Practice of Direct & Indirect Taxes, ABS
- Sengupta, C.H., Direct & Indirect Taxes, Dey Book Concern

SEMESTER -IV
Paper-V
Entrepreneurship

Time-3hours

Marks-100
(External-80)
(Internal-20)

Unit I : Introduction:

Meaning, elements, determinants and importance of entrepreneurship and creative behavior; Entrepreneurship ans Micro, Small and Medium Enterprises, Role of family business in India; The contemporary role models in Indin business: their values, business philosophy and behavioural orientations; Conflict in family business and its resolution.

Unit II :

Public and private system of stimulation, support and sustainability of entrepreneurship. Requirement, evallability and access to finance, marketing assistance, technology, and industrial accommodation, Role of industries/entrepreneur's associations and self-help groups, The concept, role and functions of business incubators, angel investors, venture capital and private equity fund.

Unit III:

Source of business ideas and tests of feasibility. Significance of writing the business plan/project proposal; Contents of business plan/project proposal; Designing business processes, location, layout, operation, planning & control; preparation of project report

Unit IV :

Mobilizing Resources – Mobilizing resources for start-up. Accommodation and utilities; Preliminary contracts with the vendors, suppliers, bankers, principal customers; Basic start-up problems;

SEMESTER -V

Paper-I

Taxation-II

Time-3hours

Marks-100
(External-80)
(Internal-20)

Unit I : Computation of Total Income and Tax Payable

a) Rate of tax applicable to different assesses (except corporate assessee)
b) Computation of tax liability of an individual, Firm (excluding application of AMT)

Unit II : TAX MANAGEMENT

a) Provision for Filing of Return
Date of filing of return, relevant forms of return, different types of returns, return by whom to be signed, PAN, TAN
b) **Assessment of Return**
Self assessment u/s140A, Summary assessment u/s 143(1), Scrutiny assessment u/s 143(3) and Best judgement assessment u/s 144.
c) Advance Tax
Who is liable to pay, due dates and computation of advance tax (excluding corporate assesses)
d) **Interest & Fees**
Section 234A, 234B, 234C, 234F (simple problems on interest and fees)
e) **TDS**
Provisions regarding TDS from salary, interest on securities, horse racing, lottery.

Unit III : Central Sales Tax

Definitions, incidence and levy of tax, exemptions and exclusions, forms under CST, determination of turnover and tax payable, registration of dealers.

Unit IV : Value Added Tax

Concepts and general principles, features, advantages and disadvantages, definitions, incidence and levy of tax. Rates of VAT. Calculation of VAT liability, input tax credit (including on Capital goods), small dealers and composition scheme, registration of dealers, cancellation of registration certificate

Unit V :Central Excise

Basic concepts, conditions and taxable event for levy of excise duty, Goods and excisable goods, Manufacture and deemed manufacture, Definitions of factory, broker or commission agent, wholesale dealer, sale or purchase, valuation – MRP, transaction value.

Unit VI : Customs

Basic concepts, Taxable event, Territorial water, Indian customs water, Goods, Types of Customs duties – Basic, Additional, Protective, Safeguard, Counter-velling duty on subsidized goods, Anti Dumping, Valuation of Custom Duty.

The indirect tax portion of this paper will be replaced by the Goods & Service Tax Law whenever the law is enforced and accordingly revised syllabus will be announced.

If any new legislations/provisions are enacted in place of the existing legislations/provisions, the syllabus will accordingly include such new legislations/provisions in place of existing legislations/provisions with effect from such date as prescribed BHUPENDRA NARAYAN MANDAL UNIVERSITY, MADHEPURA. Similarly if any existing provision becomes redundant due to changes, it will be out of the syllabus.

Suggested Readings

- Datey V. S., Indirect Taxes Law And Practice, Taxmann
- Sanjeev Kumar, Systematic Approach to Indirect Taxes, Bharat
- Bangar and Bangar, Students' Gide to Indirect Taxes, Aadhya Prakashan.
- Sengupta, C.H., Direct & Indirect Taxes, Dey Book Concern
- Roy, S. K., Principles and Practice of Direct & Indirect Taxes, ABS

SEMESTER -V

Paper-II

Public Finance and Taxation

Time-3hours

Marks-100

(External-80)

(Internal-20)

Unit 1 : Origin and Development of Public Finance

- Meaning, The rationale for State intervention – market failure, externalities, public goods
- Public finance and private finance, principle of maximum social advantage

Unit 2 : Taxation and Government Revenue

- Benefit approach, Ability to pay approach
- Impact and incidence of taxation, Direct and indirect taxes, Excess burden of taxes
- Sources and classification of public revenues

Unit 3 : Government Expenditure

- Provision of public goods and merit goods, redistribution objective of public expenditure

Unit 4 : Impact of Taxation and Public Expenditure

- Effect on on production, investment, distribution and stability

Unit 5 : Public Debt

- Meaning, Impact and Management

Unit 6 : Development of Federal Finance in India

- The constitutional arrangements, Finance Commissions

Unit 7 : Central Finances in India

- Sources and uses of funds, effects of Fiscal Policy
- Different concepts of Deficit- Impact of deficit

Unit 8 : State Finances

- Sources and uses of funds, issues of federalism

Unit 9 : Fiscal Reforms in India

- Changing scenario of Indian tax Structure, FRBM Act

Unit 10 : Issue of Public Debt in India

- Internal and External

Suggested Readings

- Musgrave, R., The Theory of Public Finance, McGraw Hill
- Musgrave & Musgrave, Public Finance in Theory and Practice, McGraw Hill
- Bhargava B.M., The Theory and Working of Union Public of India
- Vaish & Agarwal, Public Finance, Willy Eastern
- Rosen, S.H. & Gayer, T., Public Finance, McGraw Hill

SEMESTER -V

Paper-III

Corporate Accounting

Time-3hours

Marks-100
(External-80)
(Internal-20)

Unit	Topic	Details
1	Company – Introduction And Accounting for Shares & debentures	♦ Meaning of Company; Maintenance of Books of Accounts; Statutory Books; Annual Return ♦ Issue of Shares – issue, forfeiture, reissue, issue other than in cash consideration and issue to the promoters; Pro-rata issue of shares. Issue of debentures. Sweat equity. ♦ Right and Bonus Share – Rules, Accounting ♦ Underwriting of shares and debentures: Rules; Determination of Underwriters Liability – with marked, unmarked & firm underwriting; Accounting. ♦ Employee Stock Option Plan – meaning; rules; Vesting Period; Exercise Period. Accounting for ESOP. Meaning and Accounting of ESPS.
2	Buy back and Redemption of preference shares	♦ Buy Back of Securities – meaning, rules and Accounting. ♦ Redemption of Preference Shares – Rules and Accounting (with and without Bonus Shares)
3	Company Final Accounts	Introduction to Schedule III; Treatment of Tax; transfer to reserve, Dividend and applicable tax (out of current profit, out of past reserve); Preparation of Statement of Profit & Loss and Balance Sheet (tax on net profit without recognizing deferred tax)
4	Redemption of debenture	Redemption of debenture – Important Provisions, Accounting for Redemption: by conversion, by lot, by purchase in the open market (cum and ex-interest), held as investment and Use of Sinking Fund
5	Valuation	Goodwill – valuation using different methods,i.e., Average Profit, Super Profit, Capitalisation and Annuity. Shares – Valuation using different methods: Asset approach, Earnings approach, Dividend Yield, Earnings-Price, Cum-div and Ex-div, Majority and Minority view and Fair Value
6	Company Merger And Reconstruction	♦ Amalgamation, Absorption and Reconstruction-Meaning; relevant standard and meaning of different terms, Accounting in the books of Transferor Company. Accounting in the books of Transferee (based on relevant accounting standard); inter-company transactions (excluding

		inter-company share holding). ◆ Internal reconstruction – meaning, provisions and Accounting, Surrender of Shares for redistribution; preparation of Balance Sheet after reconstruction

Suggested Reading

- Sukla, Grewal, Gupta: Advanced Accountancy Vol. II, S Chand
- R.L. Gupta & Radheswamy, Advanced Accountancy Vol. II, S. Chand
- Maheshwari & Maheshwari, Advanced Accountancy Vol. II, Vikash Publishing
- Sehgal & Sehgal, Advanced Accountancy Vol. I II, Taxman Publication
- Hanif & Mukherjee, Financial Accounting, Vol III, TMH
- Frank Wood, Business Accounting Vol II, Pearson
- V.K. Goyal, Corporate Accounting, Excel Books
- Rajasekaran, Corporate Accounting, Pearson
- Accounting Standards issued by ICAI

SEMESTER -V
Paper-IV
Auditing and Assurance

Time-3hours

Marks-100
(External-80)
(Internal-20)

Unit I : CONCEPT, NEED AND PURPOSE OF AUDIT

- Definition-Nature-Scope and Objectives of Independent Financial Audit
- Basic Principles Governing an Audit, Concept of Auditor's Independence
- Errors and Fraud-Concepts, Means of doing Fraud , Auditor's Responsibility towards Detection and Prevention of Fraud, Difference between Audit and Investigation
- Classification of Audit- Organization Structure wise (Statutory, Non-statutory); Objective wise (Internal and Independent;Financial Audit); Periodicity wise (Periodical, Continuous, Interim, Final); Technique wise (Balance Sheet, Standard, Systems, EDP);
- Standards on Auditing (SA)- Concept and Purpose

Unit II : AUDIT PROCEDURES AND TECHNIQUES

- Auditing Engagement-Audit Planning-Audit Programme (Concept)
- Documentation: Audit Working Paper, Ownership and Custody of Working Papers-Audit file (Permanent and Current) – Audit Note Book – Audit Memorandum

- Audit Evidence – Cocept, Need, Procedures to obtain Audit Evidence
- Routine Checking, Test Checking and Auditing in Depth
- Concept of Analytical Procedure and Substantive Testing in Auditing.
- Audit of Educational Institutions, Hospitals and Hotels

Unit III : AUDIT RISK AND INTERNAL CONTROL SYSTEM

- Audit Risk – Concept and Types only.
- Internal Control – Definition, Objectives
- Internal Check – Definition, Objectives
- Internal Audit – Definition, Objectives, Regulatory Requirement, Reliance by Statutory Auditor on Internal Auditor's Work

(This unit should be studied with SA610)

Unit IV : VOUCHING, VERIFICATION AND VALUATION

- **Vouching :** Meaning, Objectives – Difference with Routine Checking – Factors to be Considered during Vouching – Vouching of Following Items: **(i) Receipts:** Cash Sale, Collection from Debtors, Interest and Dividend from Investment, Sale of Fixed Assets. **(ii) Payments:** Cash Purchase, Payment to Creditors, Payment of Wages and Salaries, Advertisement Expenses, Travelling Expenses, Research and Development Expenditure, Prepaid Expenses.
- **Verification and Valuation:** Concept, Objectives, Importance, Difference with Vouching, Difference between Verification and Valuation, Verification of following Items: (i) **Non-Current Assets:** Goodwill, Patent and Copy Right, Leasehold Land, Plant and Machinery, (ii) **Investments (ii) Current Assets:** Inventory, Loan and Advance, Cash and Bank Balances *(iv)* **Non-current Liability.** Secured Loan *(v)* **Current Liability:** Trade Payables (Sundry Creditors).

Unit V : COMPANY AUDIT

- Qualification, Disqualification, Appointment and Rotation, Removal and Resignation, Remuneration, Rights, Duties and Liabilities of Company Auditor
- Branch Audit and Joint Audit
- Depreciation – Concept and Provisions of the Companies Act
- Divisible Profit and Dividend (Final, Interim and Unclaimed/Unpaid): Provisions of the Act, Legal Decisions and Auditor's Responsibility

Unit VI : AUDIT REPORT AND CERTIFICATE

- **Definition** – Distinction between Report and Certificate – Different Types of Report
- Contents of Audit Report (As per Companies Act and Standards on Auditing)
- True and Fair View – Concept
- Materiality – Concept and Relevance

(This unit should be studied with SA700)

Unit VII : OTHER THRUST AREAS

- Cost Audit – Concepts, Objectives Relevant Provisions of Companies Act
- Management Audit – Concepts, Objectives, Advantages
- Tax Audit – Concepts, Objectives, Legal Provisions

- Social Audit – Propriety Audit – Performance Audit – Environment Audit (Concept only)

NOTES :

i. The provisions of the Companies Act, 1956 which are still in force would form part of the syllabus till the time their corresponding or new provisions of the Companies Act, 2013 are enforced.

ii. If new Laws or Rules are enacted in place of the existing laws and rules, the syllabus would include the corresponding provisions of such new laws and rules with immediately following Academic Year.

iii. Students are expected to develop analytical mind for answering problem based questions along with the theoretical questions.

Suggested Readings

- Tandon et al, Practical Auditing, S. Chand
- Gupta & Arora, Fundamentals of Auditing, TMH
- Jha, A., Auditing, Taxmann
- Basu, S. K., Auditing and Assurance, Pearson
- Ghosh, J., Contemporary Auditing and Assurance, Elegant Publishing
- **Standards on Audit (SA) issued by the Institute of Chartered Accountants of India**

SEMESTER -V

Paper-V

Financial Management

Time-3hours

Marks-100
(External-80)
(Internal-20)

Unit	Topic	Content
1	Introduction	• Important functions of Financial Management • Objectives of the firm: Profit maximization vs. Value maximization • Role of Chief Financial Officer. • Financial environment in which a firm has to operate
	Basic concepts	• Time Value of Money: concept and reasons • Compounding and Discounting techniques • Concepts of Annuity and Perpetuity. • Risk-return relationship (concepts only)
	Sources of Finance and Cost of Capital	• Different sources of finance; long term and short term sources • Cost of capital: concept, relevance of cost of capital, Implicit and Explicit cost, specific costs (its computation) and weighted average cost of capital, marginal cost of capital (its computation).

2		
3	Leverage and Capital Structure Theories	▪ EBIT-EPS analysis and its limitations. Financial break even, point of indifference ▪ Leverage – Business Risk and Financial Risk – Operating and financial leverage, Trading on Equity ▪ Capital Structure decisions – Capital structure patterns, designing optimum capital structure, Constraints, Features of sound capital structure. Various capital structure theories (excluding M-M model).
4	Working Capital Management (1)	▪ Introduction; Meaning and various concepts of Working Capital ▪ Management of Working Capital and Issues in Working Capital ▪ Estimating Working Capital Needs; Operating or Working Capital Cycle
5	Working Capital Management (2)	▪ Policies relating Current Assets – Conservative, Aggressive and Balanced ▪ Various sources of finance to meet working capital requirements; Financing current assets: Strategies of financing (Matching, Conservative, and Aggressive policies) ▪ Management of components of working capital (debators management only – credit period – simple type)
6	Capital Expenditure Decision (1)	▪ Purpose, Distinguishing features, Objectives & Process, Understanding different types of projects ▪ Concept of Cash flow; Cash flow vis-à-vis Profit and determination of Cash flow ▪ Techniques of Decision making: Non-discounted and Discounted Cash flow Approaches ▪ Payback Period method, Accounting Rate of Return and their relative merits and demerits
7	Capital Expenditure Decision (2)	▪ Discounted Payback Period, Net Present Value, Profitability Index and Benefit Cost ratio, Internal Rate of Return, relative merits and demerits of the methods. (excluding replacement decision) ▪ Ranking of competing projects, Ranking of projects with unequal lives. Capital Rationing
8	Dividend Decisions	▪ Meaning, Nature and Types of Dividend, Dividend and Retention; concept of pay-out ratio, retention ratio and growth. ▪ Dividend policies and formulating a dividend policy ▪ Dividend Theories: Walter's Model, Gordon's Model.

Suggested Readings

- M. Y. Khan & P. K. Jain, Financial Management, TMH
- Van Horne, Financial Management & Policy, Pearson
- Van Horne, Fundamentals of Financial Management, PHI
- Banerjee, B., Financial Policy & Management Accounting, PHI
- Chandra, P., Financial Management, TMH
- Rustagi, R.P. Fundamentals of Financial Management. Taxmann Publication Pvt. Ltd.
- Pandey, I.M. Financial Management. Vikas Publications.

- Majumdar, Ali and Nesha, Financial Management, ABS
- Kothari, R, Finance
- ial Management, Sage

SEMESTER -VI

Paper-I

COMPUTERISED ACCOUNTING SYSTEM and E-FILING OF RETURN

Time-3hours

Marks-100
(Exterrnal-80)
(Internal-20)

Unit 1. Computerized Accounting Package : Using Generic Software

a) Company creation, ledger creation, order processing, accounting voucher, inventory voucher, memorandum voucher, invoicing, multiple god own handling, Transfer of materials across god owns, Bank Reconciliation.
b) Cost Centre, Cost Category, Bill of Material (BoM), Budget and Controls
c) Payroll Accounting
d) TDS, GST
e) Back up & Restore, Export and Import data

Unit 2. Designing Computerized Accounting System

a) Introduction to DBMS Package – Table, Query, Form and Report
b) Designing Computerized Accounting System using DBMS Package
Creating a voucher entry Form, Preparing ledgers, trial balance, profit & loss a/c, and balance sheet with Form wizard and Report
c) Designing Payroll System for Accounting using Form, Query, and Report

Unit 3. E-filling of Tax return

a) Preparation and submission of the Income Tax Return (ITR) offline/online for individual taxpayer (e-filing without using DSC and with using DSC, EVC)
b) View form 26AS, Upload return, View e-file returns, e-verification
c) Use of e-tax calculator (including interest calculation u/s 234A, 234B, 234C)
d) E-Pay tax (Challan No./ITNS 280, ITNS 281)
e) Preparation and submission online form 10E (Relief u/s 89(1))

Vinod Kumar Tiwari
Officiating Head Deptt (Comm)

SEMESTER -VI

Paper-II

Direct Tax Law and Practice

Time-3hours

Marks-100
(External-80)
(Internal-20)

Unit 1 :

a) Residential Status and Incidence of Tax

Residential status of a company & tax incidence. Income deemed to accrue or arise in India

u/s 9.

b) Incomes which do not form part of Total Income

Sec 10(11A), 10(12A), 10(30), 10(31), 10(34) read with sec. 115BBDA, 10(35), 10(43) and 10AA.

Unit 2 : Heads of Income and Provisions Governing Heads of Income

a) Profits and gains of business or profession

Advance level discussion with special emphasis on presumptive taxation

b) Capital Gains

Advance level discussion with special emphasis on transfer, treatment u/s 45(1A), 45(2), 45(3), 45(4), 45(5), Transfer of assets between holding and subsidiary company, and exemptions.

c) Income from other sources

Advance level discussion with special emphasis on gift and deemed dividend.

Unit 3 : a) Income of other Persons included in Assessee's Total Income

Revocable transfer of assets, Income from assets transferred to the benefit of spouse and son's wife, conversion of self acquired property into joint family property.

b) Deductions from Gross Total Income

Deductions u/s 80IAB, 80IAC, 80IBA, 80IE, 80JJ, 80JJAA

Unit 4 : a) **Relief U/S 89**

b) Double Taxation Relief

c) Business Restructuring – Amalgamation, Demerger, Slump Sale with special reference to treatment of depreciation and capital gains.

Unit 5 : Computation of Total Income and Tax Payable

Advance level problems on computation of total income and tax liability of an individual, HUF, Firm, LLP and AOP (including application of AMT)

Suggested Readings

- Singhania V.K., and Singhania K, Direct Tax Law and Practice, Taxmann
- Lal and Vashist, Direct Taxes, Pearson
- Ahuja and Gupta, Direct Taxes Law And Practice, Bharat
- Manoharam and Hari, Direct Tax Laws, Snowwhite

SEMESTER -VI
Paper-III
I C T (Practical)

Marks-100
(External-60, Internal-40)

Unit 1: Word Processing

Working with word document- Editing text, Find and Replace text, Formatting, Spell check, Autocorrect, Auto text; Bullets and numbering, Tabs, Paragraph Formatting, Indent, Page Formatting, Header and Footer, Macros, Drop cap; Tables: Inserting, Filling and formatting a table, Inserting Pictures and Video; Mail Merge- including linking with Database, Printing documents.

Creating Business Presentations using above facilities.

Unit 2: Preparing Presentations

Basics of presentations: Slides, Fonts, Drawing, Editing; Inserting: Tables, Images, texts, Symbols, Media; Design; Transition; Animation, Hyperlink and Slideshow.

Creating Business Presentations using above facilities.

Unit 3: Spreadsheet and its Business Applications

Managing worksheet- Formatting, Entering data, Editing, and Printing a worksheet; Handling operators in formula, Project involving multiple spreadsheets, Organising Charts and graphs, Pivot Table.

Spreadsheet Functions: Mathematical [SUMIF, SQRT, SUBTOTAL, SUMPRODUC Tetc.], Statistical [AVERAGE, STDEV, VAR, CORRELATION, REGRESSION etc.], Financial (PMT, RATE, PV, FV, NPER, IRR, NPV, Data Table Etc.] Logical [AND, OR, IF etc.], Date and Time, lookup and reference, Database and Text functions.

Creating Spreadsheet in the area of: Loan and Lease statement; Ratio Analysis; Payroll Statements; Capital Budgeting; Depreciation Accounting; Graphical Representation of Data; Frequency Distribution and its Statistical Parameters; Correlation and Regression

Unit 4: Database Management System

Creation of Tables, Multiple Table Handling-Defining Relationship [Foreign Key], Simple and Conditional Queries, Types of Queries [Update, Delete, Append], Forms, Reports, Introduction to SQL through Basic Commands.

Applying DBMS in the areas of Accounting, Inventory, HRM and its accounting, Managing the data records of Employees, Suppliers and Customers.

Suggested Readings

- Thareja, IT & Application, Oxford
- Aurora, Computer Fundamentals of Computers, BPB Publications
- Dhar, P., Fundamental of IT and its Application in Business, APH

SEMESTER -VI
Paper-IV

Project Work

Marks-150
(External-75)
(Internal-75)

Project work in Teaching Subject.

SEMESTER -VI
Paper-V
Viva

Marks-50

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Madhepura College, Madhepura

(Affiliated to BNM University,Madhepura)

B.Voc. in Information Technology (UGC)

B.VOC
In
INFORMATION TECHNOLOGY
(UGC)

INTRODUCTION

The University Grants Commission (UGC) has launched a scheme on skills development based higher education as part of college/university education, leading to Bachelor of Vocation (B.Voc.) Degree with multiple exits such as Diploma/Advanced Diploma under the NSQF. The B.Voc.programme is focused on universities and colleges providing undergraduate studies which would also incorporate specific job roles along with broad based general education. This would enable the graduates completing B.Voc.to make a meaningful participation in accelerating India's economy by gaining appropriate employment, becoming entrepreneurs and creating appropriate knowledge.

The proposed vocational programme in Software Development will be a judicious mix of skills, professional education related to Software Development and also appropriate content of general education. It is designed with the objective of equipping the students to cope with the emerging trends and challenges in the Software Development environment.

PROGRAMME STRUCTURE

The B.Voc Information Technology shall include:

- Language courses (English)
- General Education Components
- Skill Components
- Project
- Industrial Training
- Soft Skills and Personality Development Programmes
- Study tours

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Programme Structure

Semester-I

Course Title	G.C./S.C.	Credits	Marks Distribution		Total
			Internal	External	
Speaking and Listening Skills	G.C.	4	10	40	50
Introduction to IT	G.C.	4	20	80	100
Programming Principles	G.C.	4	10	40	50
Word Processing & Image Editing	S.C.	6	20	80	100
Photoshop Lab	S.C.	6	10	40	50
Page Maker Lab	S.C.	6	10	40	50

Semester-II

Course Title	G.C./S.C.	Credits	Marks Distribution		Total
			Internal	External	
Mathematics I	G.C.	4	10	40	50
Animation Software	G.C.	4	10	40	50
Network & Internet Application	G.C.	4	20	80	100
C Programming	S.C.	6	20	80	100
C Programming Lab	S.C.	6	10	40	50
Animations Lab	S.C.	6	10	40	50

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Semester-III

Course Title	G.C./S.C.	Credits	Marks Distribution		Total
			Internal	External	
System Analysis & Design	G.C.	4	10	40	50
Management Information Systems	G.C.	4	10	40	50
Web application & Development	G.C.	4	20	80	100
Operating System	S.C.	6	20	80	100
Web Development Lab	S.C.	6	10	40	50
Computer Hardware Lab	S.C.	6	10	40	50

Semester-IV

Course Title	G.C./S.C.	Credits	Marks Distribution		Total
			Internal	External	
Mathematics II	G.C.	4	10	40	50
Network Administration	G.C.	4	20	80	100
Object Oriented Programming	G.C.	4	20	80	100
Visual Tools	S.C.	6	10	40	50
Visual Tools Lab	S.C.	6	10	40	50
OOP & Network Lab	S.C.	6	10	40	50

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Semester-V

Course Title	G.C./S.C.	Credits	Marks Distribution		Total
			Internal	External	
Introduction to Information Security	G.C.	4	10	40	50
Programming in Java	G.C.	4	20	80	100
Software Testing	G.C.	4	10	40	50
Software Engineering	S.C.	6	20	80	100
Java Lab	S.C.	6	10	40	50
Major Project (Phase-I)	S.C.	6	10	40	50

Semester-VI

Course Title	G.C./S.C.	Credits	Marks Distribution		Total
			Internal	External	
IT & Society	G.C.	4	10	40	50
Mobile Application Development	G.C.	4	20	80	100
Database Administration	G.C.	4	10	40	50
Advanced Java	S.C.	6	20	80	100
Android & Java Lab	S.C.	6	10	40	50
Major Project (Phase-II)	S.C.	6	10	40	50

- G.C. – General Component
- S.C. – Skill Component

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MADHEPURA COLLEGE, MADHEPURA

Syllabus of Information Technology (IT)

SEMESTER – 1

Program- B.VOC	Externnal-40
Branch-Information Technology	Internal-10
Paper -I	Total Marks-50
Time-3hours	

Speaking and Listening Skills

AIMS

1. To familiarize students with English sounds and phonemic symbols.
2. To enhance their ability in listening and speaking.

OBJECTIVES :

On completion of the course, the students should be able to

1. listen to lectures, public announcements and news on TV and radio.
2. Engage in telephonic conversation.
3. Communicate effectively and accurately in English.
4. Use spoken language for various purposes.

Course outline

Module 1

Pronunciation

Phonemic symbols – consonants – vowels – syllables – word stress – strong and weak forms- intonation

Module 2

Listening Skills

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Difference between listening and hearing – active listening –barriers to listening – academic listening – listening for details – listening and note-taking – listening for sound contents of video – listening to talks and descriptions – listening for meaning – listening to announcements – listening to news programs.

Module 3

Speaking Skills

Intractive nature of communication – importance of context – formal and informal – set expressions in different situations –greeting – introducing – making requests – asking for giving permission – giving instructions and directions – agreeing / disagreeing – seeking and giving advice – inviting and apologizing telephonic skills – conversational manners.

Module 4

Dialouge Practice

(Students should be given ample practice in dialogue, using core and supplementary materials.)

COURSE MATERIALS

Modules 1-3

Core reading: *English for Effective Communication. Oxford University Press, 2013*

Further reading:

1. Marks, Jonathan, *English Pronunciation in Use*. New Delhi: CUP,2007.
2. Lynch,Tony. *Study Listening*.New Delhi:CUP, 2008.
3. Kenneth, Anderson, Tony Lynch, Joan MacLean. *Study Speaking*. New Delhi: CUP,2008.

Reference:

Jones,Daniel, *English pronouncing Dictionary* 17thEdition. New Delhi: CUP, 2009.

MODULE 4:

Core reading: *Dramatic Moments: A BOOK of One Act Plays*. Orient Black Swan, 2013.

The following One-act plays prescribed:

1. Serafin and Joaquin Alvarez Quinters - A Sunny Morning
2. H.H.Munro - The Death Trap
3. Vincent Godefroy - Fall Not Our Feast

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Program- B.VOC	External-80
Branch-Information Technology	Internal-20
Paper -II	Total Marks-100
Time-3hours	

INTRODUCTION TO IT

SKILL COMPONENT

AIM:

- **To create overall generic awareness about scope of the field of IT and to impart basic personal computing skills.**
- To create background knowledge for the various courses in the programme.

OBJECTIVES:

- ✓ **To introduce the basic terminology in the field of IT**
- ✓ **To impart functional knowledge about PC hardware, operations and concepts**
- ✓ **To impart functional knowledge in the use of GUI Operating System**
- ✓ **To impart functional knowledge in a standard office package (word processor, spread sheet and presentation softwares) and popular utilities**
- ✓ **To impart functional knowledge about networks and internet.**
- ✓ **To give an overview of computer application in various fields and an overall generic awareness about the scope of the field of IT**

SYLLABUS

Module 1: *Computer characteristics*: Speed, storage, accuracy, diligence; Digital signals, Binary System, ASCII; Historic Evolution of Computers; Classification of computers: Microcomputer, Minicomputer, mainframes, Supercomputers; Personal computers: Desktop, Laptops, Palmtop, Tablet PC; Hardware & Software; Von Neumann model.

Module 2: Hardware: CPU, Memory, Input devices, output devices. Memory units: RAM (SDRAM, DDR RAM, RDRAM etc. feature wise comparision only); ROM – different types: Flash memory; Auxillary storage: Magnetic devices, Optical Devices; Floppy, Hard disk, Memory stick, CD, DVD, CD-Writer; Input devices – keyboard, mouse, scanner, speech input devices, digital camera, Touch screen, Joystick, Optical readers, bar code reader; Output devices: Display device, size and resolution; CRT, LCD; Printers: Dot-matrix, Inkjet, Laser; Plotters, Sound cards & speaker.

Module 3: Software- System software, Application software; concepts of files and folders, Introduction to Operating systems, Different types of operating systems: single user, multitasking, time-sharing multi-user; Booting, POST; Basic features of two GUI operating

systems: Windows & Linux (Basic desk top management); Programming Languages, Compiler, Interpreter, Databases; Application softwares: Generic Features of Word processors, Spread sheets and Presentation softwares; Generic introduction to Latex for scientific typesetting; Utilities and their use; Computer Viruses & Protection, Free software, open source.

Module 4: Computer Networks- Connecting computers, Requirements for a network: Server, Workstation, switch, router, network operating systems; Internet: brief history, World Wide Web, Websites, URL, browsers, search engines, search tips; Internet connections: ISP,Dial-up,cable modem, WLL, DSL,leased line; email software features (send receive,filter,attach,forward, copy, blind copy); characteristics of web-based systems, Web pages, introduction to HTML.

REFERENCES:

Core

- E. Balagurusamy, *Fundamentals of Computers*, McGraw hill, 2014

Additional

- Dennis P Curtain, *Information Technology*: The Breaking wave, McGrawhill,2014
- **Peter Norton, Introduction to Computers, McGrawhill, Seventh edition**

Program- B.VOC	Externnal-40
Branch-Information Technology	Internal-10
Paper -III	Total Marks-50
Time-3hours	

PROGRAMMING PRINCIPLES

AIM

- To give an awareness about the background knowledge required for problem solving

OBJECTIVES

At the end of the course the students will be able to

- Explain problem solving steps
- Develop algorithm for different problems
- Draw flow chart
- Analyse algorithms

SYLLABUS

Module1: Problem Solving and the Computer: Problem Definition, Solution Design, Solution Refinement, Testing Strategy Development, Program Coding and Testing, Documentation Completion, Program Maintenance.

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Module2: Software and types of Software, Programming Languages- Machine Language, AssemblyLanguage, High Level Language, Object Oriented Language and its features.

Module3: Algorithms and Their Representations, Flow charts, Pseudo code, Types of Programming, Languages, Structured Programming, Different approaches of Programming:Top-down and Bottom-up, Life Cycles Stages of Programming, Features of a good computer program.

Module4: Areas of algorithm study, performance analysis – space complexity, time complexity, asymptotic notations {Ω,Θ}.

REFERENCES:

- Computer Fundamentals By P K Sinha&PritiSinha Fourth Edition.
- Ellis Horowitz, SartajSahni, SanguthevanRajshekharan

Program- B.VOC	External-80
Branch-Information Technology	Internal-20
Paper -IV	Total Marks-100
Time-3hours	

WORD PROCESSING & IMAGE EDITING

AIM

- To create knowledge of word processing, power point, flash and photoshop

OBJECTIVES

At the end of the course the students will be able to

- Prepare office document
- Create presentation
- Design multimedia presentation
- Edit images

SYLLABUS

Module1: Wordprocessing: Word processing concepts, Editing, Formatting Text, Table Manipulation, Indexing, Mail merge, Documentation, Inserting Word Art, Inserting Picture and clip Arts, Auto formatting, Tools, Macros

Module2: Power Point: Beginning a presentation, Templates and Slide Master, Drawing Tools, ClipArt and WordArt, Organization Charts, Graphs, Output and Presentation Options, Integrating with Animation and Multimedia packages.

Module3: Flash: Introduction, Drawing, Working with Colour. Using Imported Artwork, Adding Sound, Working with Objects, Using Layers, Using Type, Using Symbols and Instances, Creating Animation, Creating interactive movies, Creating Printable movies, Publishing and Exporting.

Module4: Photoshop: Getting image into Phoyoshop, Selecting, Transforming and Retouching, Drawing, Painting, Applying Filters for special effects, Designing Web pages, Creating Rollovers and Animations, Preparing Graphics for the Web, Saving and exporting image.

CORE

1. Microsoft®Office Word 2003, Online Training Solutions Inc.
2. Powerpoint 2003 Essential Training,David Rivers
3. Flash CS3 Professional for Windows and Macintosh,Katherine Ulrich

Reference Books:

i. Exploring Microsoft Wprd 2003 Comprehensive, Robert T. Grauer and Maryann Barber
ii. Microsoft®Office PowerPoint® 2003, Online Training Solution Inc.
iii. Adobe Flash CS3 Professional Hands-On Training, Todd Perkins

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Program- B.VOC	Externnal-40
Branch-Information Technology	Internal-10
Paper -V	Total Marks-50
Practical	

PHOTOSHOP LAB

Students should provide hands-on knowledge with the Pagemaker software for preparing documents with the knowledge they acquired through module 1 of the paper VS 315

Program- B.VOC	Externnal-40
Branch-Information Technology	Internal-10
Paper -VI	Total Marks-50
Practical	

PAGEMAKER LAB

Students should provide hands-on knowledge with the Photoshop software for editing images with the knowledge they acquired through module 4 of the paper VS 315

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MADHEPURA COLLEGE, MADHEPURA

Syllabus of Information Technology

SEMESTER – 2

Program- B.VOC	External-40
Branch-Information Technology	Internal-10
Paper -I	Total Marks-50
Time-3hours	

MATHEMATICS I

SYLLABUS

Module-I : Review of basic differentiation, Differentiation of hyperbolic functions, derivatives of hyperbolic functions, inverse hyperbolic functions logarithmic differentiation, implicit differentiation, Lebnitz's theorem, Mean value theorem, Rolle's theorem, Lagrange's mean-value theorem, Maxima and minima.

Module-II : Differential equations, General Concepts, Formulation and solution of differential equations, solution of higher order linear Des. Partial Des, Laplace and inverse Laplace transforms,

Module-III : Theory of Numbers, prime numbers, Unique factorization theorem, Euclidean algorithm, congruences, Fermat's theorem, Wilson's theorem.

Module-IV : Complex Numbers, Separation into real and imaginary parts, Complex mapping

Module-V : Miscellaneous Topics: Markov processes. Harmonic analysis and Fourier series, Linear Programming

REFERENCES

Core

- Erwin KreyzigAdvanced Engineering Mathematics, New Age International Pvt Ltd.
- Shanthi Narayan, Differential Calculus, S Chand & Company
- ZafarAhsan, Differential Equations and their applications.
- RudraPratap, Getting Started with MATLAB, Oxford University Press

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Program- B.VOC	Externnal-40
Branch-Information Technology	Internal-10
Paper -II	Total Marks-50
Time-3hors	

ANIMATION SOFTWARES

AIM

- To create skills in animation

OBJECTIVES

At the end of the course the students will be able to

- Create objects using 3DMax
- Perform animation
- Add special effects

SYLLABUS

Module 1 : Introduction to 3D Max, Creating objects, Selecting objects, Transforming objects
Module 2 : Animation, Modifying objects and Editing Objects
Module 3 : Compound objects, Cameras, Lights
Module 4 : Maps and Material, Rendering and Special Effects

REFERENCE

- 3D Studio MAX® R3 Bibleby Kelly L. Murdock
- 3D Studio MAX In Motion: Basics Using 3D Studio MAX 4.2by Stephen J. Ethier and Christine A. Ethier

Program- B.VOC	Externnal-80
Branch-Information Technology	Internal-20
Paper -III	Total Marks-100
Time-3hours	

COMPUTER NETWORKS AND INTERNET APPLICATIONS

AIM

- To create an awareness of internet and different tools used

OBJECTIVES

At the end of the course the students will be able to

- Explain different components for internet
- Discuss different applications of it

SYLLABUS

Module-I : Computer Network: Introduction, Uses of computer networks, Networks Hardware, LAN, MAN, WAN, Protocol hierarchies, OSI Model, TCP/IP reference model.
Module-II : History of internet, The early years, The global internet, A global information infrastructure, Review of packet switching and its relevance to the internet, Incompatible

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topologies, Routers, Dial-up access, Software to create a virtual network, Datagrams, IP address.

Transmission Control Protocol (TCP) : Software for reliable communication, Guaranteed delivery, Recovering the datagrams, Automatic retransmission, Brief discussion on distributed computing, Domain names, Names and IP address, TCP/IP, Flexibility, Reliability and efficiency.

Module III : Electronic mail, Mail box, Sending, Notification, Reading, How it works, Address format, E-mail to and from non-Internet sites, Access to service via E-mail, Speed and reliability, Impact and significance, Joining a mailing list. Bulletin Board Services (BBS), Network norms, News group, Selection, Subscription, Readings, submitting, article, How BBS works File Transfer Protocol (FTP) Store/retrieve, Binary and text files, How FTP works, Impact and significance, Remote login, How it works, TELNET

Module IV : Browsing the World Wide Web (WWW), How a browser works, Software used to access, URLs, Browser. WWW documents, HTML, Web page design with HTML, Features and importance of HTML. Advanced WEB technologies, CGI, How it works. CGI and advertising Search engines, Browsing, Searching, and Search tool, Advanced search engines, Examples of search engines.

Text :

i. Ferozan. Introduction to Data Communication & Networking, TMH
ii. Leon and Leon, Internet For Everyone, LeonTechworld, Chennai

References:

i. Douglas E Comer, The Internet Book, 2nd Edition, Prentice Hall of India.
ii. Nancy Cadeno, The Internet Tool Kit, BPB Publications.
iii. Christian Crumlish, ABC's of the Internet, 2nd Edition, BPB Publications
iv. Patrick Naughton, Java Hand Book, Tata McGraw Hill

Program- B.VOC	External-80
Branch-Information Technology	Internal-20
Paper -IV	Total Marks-100
Time- 3 hours	

C-PROGRAMMING

AIM

- To Expose students to algorithmic thinking and problem solving and impart moderate skills in programming in a industry-standard programming language

OBJECTIVES

- To expose students to algorithmic thinking and algorithmic representations
- To introduce students to basic data types and control structures in C
- To introduce students to structured programming concepts
- To introduce students to standard library functions in C language

SYLLABUS

Module-I : Introduction to programming : Character set, Variables and Constants, Rules for naming the Variables/Identifiers; Basic data types of C, int, char,float, double; storage capacity range of all the data types; Storage classes;

Module-II : Basic Elements : Operators and Expressions: Assignment Operator, Arithmetic Operator and Arithmetic expression, Relational Operator and Relational exp., Logical Operator and how it is used in condition, Expression Evaluation (Precedence of Operators); simple I/O statements, Control structures, if, if else, switch-case, for, while, do-while, break, continue. Arrays, Defining simple arrays, Multi-dimensional arrays, declaration, initialization and processing;

Module-III : Functions & Pointers: concept of modular programming, Library, User defined functions, declaration, definition & scope, recursion, Pointers: The & and * Operators, pointer declaration, assignment and arithmetic, visualizing pointers, call by value, call by reference, dynamic memory allocation.

Module-IV : Advanced features: Array & pointer relationship, pointer to arrays, array of pointers. Strings: String handling functions; Structures and unions; File handling: text and binary files, file operations, Library functions for file handling, Modes of files.

REFERENCES

Core

- Ashok N. Kamthene, Programming in C, Pearson Education, Second edition
- E.Balaguruswamy, Programming in ANSI C, McGrawhill, Sixth Edition

Program- B.VOC	External-40
Branch-Information Technology	Internal-10
Paper -V	Total Marks-50
Practical	

C-PROGRAMMING LAB

AIM:

- To provide an opportunity for hands-on practice of basic features of DOS, Windows, software tools (word processor, spread sheet, presentation s/w) and algorithmic thinking and problem solving in a industry standard programming language

OBJECTIVES :

After the completion of this course, the student should be able to:

- Create, Save, Copy, Delete, Organise various types of files and manage the desk top in general
- Use a standard word processing package Exploiting popular features
- Use a standard spread-sheet processing package Exploiting popular features
- Use a standard presentation package Exploiting popular features

Also, this course will provide hands-on practice in the following topics, under a variety of programming situations with a focus on writing, debugging and analyzing structured programs:

- Basic data types in C.
- Basic control structures in C.
- Arrays, structures and files
- Standard library functions in C language
- Solving moderately complex problems involving the above and requiring selection of appropriate data structures and efficient algorithms

SYLLABUS

1. Familiarization of important DOS/Windows/Linux features
2. Practice on basic features of word processor, spread sheet and presentation software.

Part A

The C laboratory work will consist of 15-20 Experiments

1. Testing out and interpreting a variety of simple programs to demonstrate the syntax and use of the following features of the language: basic data types, operators and control structures.

Part B

2. 1-D Arrays: A variety of programs to declare, initialize, read, print and process 1-D arrays of various basic data types. Processing to include, selection, sum, counting, selective sum, selective counting, reversing etc.
3. Pointers: A large number of trivial programs involving all possible data types to familiarize the syntax of pointers in a variety of situations and to draw memory diagrams based on the observations.
4. Structures: A variety of programs to declare, initialize, read, print and process structures made up of a variety of data types and structures.
5. 2-D Arrays: A variety of programs to declare, initialize, read, print and process 2-D arrays of various basic data types. Processing to include, selection, sum, counting, selective sum, selective counting, reversing etc.
6. Array of Structures and Structure of Arrays: Programs to demonstrate declaration and processing of structure of arrays and array of structures.
7. Pointers to Arrays: A number of programs to demonstrate handling of 1-D and 2-D arrays using pointers and to draw memory diagrams based on the observations.
8. Pointers to Structures: A number of programs to demonstrate use of pointers to structures and to draw memory diagrams based on the observations.
9. Functions – I: Simple Examples of declaring and using functions of the following categories (i) no argument, no return, (ii) argument, no return, (iii) no argument, return, (iv) argument, return, all pass by value
10. Functions –II : Declaring and using functions with pass by reference, Passing and Returning structures, Recursive functions.
11. Files: Simple Example involving use of multiple files: declaring, opening, closing, reading from and writing to text files.
12. Files: Example involving use of multiple files: declaring, opening, closing, reading from and writing to binary files.

13. Library functions: A variety of Examples demonstrating **(i) string processing functions** (ii) a variety of selected library functions
14. Debugging programs involving syntactic and/or logical errors

16-20 : Developing programming solutions to problems **including program design, algorithm** development and data structure selection.

REFERENCES

- **Deitel&Deital, C: How to Program, Pearson** Education
- **Alan R Feuer, The C Puzzle Book, Pearson** Education
- **YashwantKanetkar, Test Your C Skills, BPB** Publications, **3rd Edition**

Program- B.VOC	Externnal-40
Branch-Information Technology	Internal-10
Paper -V1	Total Marks-50
Practical	

ANIMATIONS LAB

Students should provide hands-on knowledge with the 3D Max software for creating animation **with the knowledge they acquired** through module 1 of the paper ANIMATION SOFTWARES.

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MADHEPURA COLLEGE, MADHEPURA

Syllabus of Information Technology

SEMESTER – 3

Program- B.VOC,	Externnal-40
Branch-Information Technology	Internal-10
Paper -I	Total Marks-50
Time-3hours	

SYSTEM ANALYSIS AND DESIGN

AIM:

- To provide an overview of how a software is developed and what are the different stages by which the development take place.

OBJECTIVES

At the end of this course, the students will be able to

- Explain the background study required for developing a system
- Design a new system
- Discuss types of testing
- Select the hardware and software required for a system

SYLLABUS

Module I : Overview of System analysis and Design : Business system concepts, project selection, sources of project requests, preliminary investigation, System development life cycle – Feasibility analysis, design, implementation, testing and evaluation, project review.

Feasibility study – technical and economical feasibility, cost and benefit analysis, fact finding techniques, DFD, Data dictionaries, Decision analysis, decision trees and tables.

Module II : *System design* – Design objectives, Process and stages of system design, Design methodologies, structured design, structured walkthrough, audit considerations, audit trials, detailed design, modularization, module specification, software design and documentation tools, top down and bottom up approaches

Module III : *Testing & System Conversation* : Unit and integration testing, testing practices and plans, system control and quality assurance, training, conversion, operation plans, system administration.

Module IV : *Hardware and Software selection* : Benchmarking, Financial considerations in selection software selection, vendor selection, performance and acceptance criteria.

REFERENCES

- Award, EM, Systems Analysis and Design, Galgotia Pub, 1991

Additional

- Lesson, System analysis and Design, SRA pub, 1985

❖ Rajaraman V, Analysis and Design of Information systems, PHI, 1991

Program- B.VOC	Externnal-40
Branch-Information Technology	Internal-10
Paper -II	Total Marks-50
Time-3hours	

MANAGEMENT INFORMATION SYSTEMS

SYLLABUS

Module I : An introduction to information systems, Information systems in organizations, Information Technology Concepts, The IS Revolution; Information requirement for the different levels if management, transaction processing system, Management information system, Decision support system. Strategic Role of Information Systems. Business Processes; Information management, and Decision Making. Computers and Information Processing;
Module II : Transaction processing system; hardware and software requirements, tools used, case studies, merits and demerits of transaction processing system.

Module III : Managerial control, information and tools required, difference between transactional system and managerial system. Frequency of taking outputs, Need for interconnected system, common database, Redundancy control, case studies. Decision support system, concept and tools, case studies, virtual organizations, strategic decisions-unstructured approach, cost and values of unstructured information.

Module IV : Optimization techniques, difference between optimization tools and DSS tools expert system, difference between expert system and management information system. Role of chief information officer.

REFERENCES :

- Management Information Systems, by Rajaraman
- Management Information Systems, by By S. SADAGOPAN, Prentice-Hall of India
- Management Information Systems, By Uma G. Gupta, Galgotia Publications
- Management Information Systems, By JAWADEKAR, W.S., Tata McGraw-Hill

Program- B.VOC	Externnal-80
Branch-Information Technology	Internal-20
Paper -III	Total Marks-100
Time-3hours	

WEB APPLICATION & DEVELOPMENT

AIM :

- To Expose students to technology of web sites and to introduce various tools and languages required for technical and creative design of state-of-the-art web sites

OBJECTIVES :

To impart basic skills in moderately complex use of the following tools/scripts/languages:

- HTML, DHTML, CGI Script, Perl, CSS, Java script, ASP and JSP.
- To impart necessary ability to choose the appropriate web tools/languages for creating state-of-the art web sites
- To Expose students to current trends and styles in web design and applications

SYLLABUS

Module - I : *HTML* : General Introduction to Internet and WWW; Text tags; Graphics, Video and Sound Tags; Link and Anchor Tags; Table Tags; Frame Tags; Miscellaneous tags (layers, image maps etc); CSS; DHTML; Example Applications; simple introduction to XML and VRML

Module – II : *CGI Programming* : HTML Forms and Fields; Perl: Basic control structures, data types and basic features; CGI Programs: CGI Programs: GET & POST methods, simple applications; Cookies; Server Side Includes; Example Applications;

Module – III : Javascript: Basic data types; control structures; standard functions; arrays and objects, event driven programming in Javascript; Example Application;

Module – IV : Architecture of Java Servelets; Servelet Structure: Servelet Life Cycle; Request and Response Objects; Sessions; Invoking Servelets;

REFERENCES

❖ V.K. Jain, Advanced Programming in Web Design, Cyber Tech Publications

Additional

- Joel Sklar, Principles of Web Design, Vikas
- H M Deitel, P J Deitel & A B Goldberg, Internet and Worldwide web programming: How to Program, 3/e, Pearson Education

Program- B.VOC	Externnal-80
Branch-Information Technology	Internal-20
Paper -IV	Total Marks-100
Time-3hour	

OPERATING SYSTEMS

AIM

- To discuss the internal working of operating systems

OBJECTIVES

At the end of the course the students will be able to

- Discuss the installation of windows
- Explain the ways of diagnosis
- Make a system secure

SYLLABUS

Module I : Baiscs of Operating System : Differences between DOS, Windows 2000/XP and Linux operating systems, starting and exiting from a program in Windows 2003/XP, Linux, files and folders in Windows 2003/XP/Linux copying and moving files under Windows 2003/XP.the use of explorer, study of control panel and its settings

Module II : Installation and Administration of Windows 2003 and Linux: The minimum hardware requirements for the installation, the steps involved in installation. Booting process of Windows 2003/XP/Linux the plug and play feature of Windows 2003/XP – the automatic detection of new hardware at booting time, the boot sector, Architecture of Windows 2003/XP, the Recycle bins, DLL files. The Windows registry and its importance, the device drivers, the addition of new hardware and software to a Windows 2003/XP system, the device manager of 2003/XP, changing of display settings, setting of screen savers and their password protection, configuration of keyboard & mouse in Windows 2003/XP

Module III : Taking Care of System Health & Debugging: System testing and diagnosis using available diagnostic programs like AMIDIAG, PC tools, Norton utilities etc and latest trends. Debugging Tools, procedures, features and their use.

Module IV : Windows based back-up Procedures & Disaster Prevention : Write protection of your software MS-Windows delete protection, crash recovery, preventing hard disk failure, Back-up & Restore procedures, types of back-up, media for back-up, Raid systems. Preparation of bootable CD and FD.

REFERENCES

- Windows Internals - Part 1 by Mark Russinovich, David A. Solomon and Alex Lonescu (2 January 2013)
- Windows Internals - Part 2 by Mark Russinovich, David A. Solomon and Alex Lonescu (2 January 2013)

Program- B.VOC	External-40
Branch-Information Technology	Internal-10
Paper -V	Total Marks-50
Practical	

WEB DEVELOPMENT – LAB

AIM :

- To give hands-on Exposure to various tools and languages required for technical and creative design of web sites

OBJECTIVES

To practice moderately complex use of the following scripts/languages/technologies :

- ✓ HTML, DHTML, CSS
- ✓ Java script
- ✓ CGI Script, Perl

SYLLABUS

The laboratory work will consist of 15-20 Experiments

Part A (HTML)

Part B (Javascript, XML, Perl, CGI)

1. Practicing basic HTML tags, text tags test styles, paragraph styles, headings, lists

2. Tables in HTML, Frames in HTML, nested frames, Link and Anchor Tags
3. Including graphics, video and sound in web pages, including Java applets
4. Layers & Image Maps
5. Creating animated Gifs, simple flash animations
6. Cascading Style sheets
7. DHTML
8. Creating and browsing XML database
9. Installing VRML plugins and viewing VRML source files
10. HTML forms and Fields
11. Exercises covering basic introduction to perl
12. Installing web server, setting CGI, connecting HTML forms to Perl Scripts (CGI programming)
13. Exercises covering basic introduction to Javascript

14-20 : Development of a web site involving a variety of tools practiced above

REFERENCES

❖ V.K Jain, Advanced Programming in Web Design, Cyber Tech Publications

Additional

- H M Deitel, P J Deitel & A B Goldberg, Internet and Worldwide web programming: How to Program, 3/e, Pearson Education

Program- B.VOC	External-40
Branch-Information Technology	Internal-10
Paper -VI	Total Marks-50
Practical	

COMPUTER HARDWARE – LAB

- Students should be provided with hands-on experience on hardware assembling, trouble shooting, installation of operating system and other softwares, ensure security of systems and so on.

MADHEPURA COLLEGE, MADHEPURA

Syllabus of Information Technology

SEMESTER – 4

Program- B.VOC	External-40
Branch-Information Technology	Internal-10
Paper -I	Total Marks-50
Time-3hours	

Mathematics II

SYLLABUS

Module I : Proof Methods, Logic: Formal proofs, Propositional reasoning, Proofs by contradiction, False Proofs, Proofs by Induction, Symbolic Logic: Boolean expressions, Logical Equivalance, DeMorgan's Law, tautologies, Implications, Arguments, Fallacies, Normal forms in prepositional logic, Resolution

Module II : Set Theory, Relations, Functions : Review of Set theory concepts, set operations, characteristic functions, fuzzy set theory basics, Relations: opetrations on relations, equivalence relations & partitions, partial orders, ordered sets, Warshal's algorithm, Functions, Recursion.

Module III : Algebraic Structures : Algebra, DeMorgan's Law, Group, Ring, Polish Expressions, Communication Model and error corrections, Hamming Codes

Module IV : Graph Theory : Introduction, Graph Notation, Topological sort, Graph Propagation algorithm, Depth First, Breadth-first searches, Shortest Path algorithms, Directed acyclic graphs.

Module V : Miscellaneous Topics : Graphical representations of functions, Graphical Interpretation of convergence, Complex Mapping, Fractals, Grammars, Languages and Automaton. Introduction to Matlab (Matrix, Linear Algebra, Graphics operations)

REFERENCES

- Rajendra Akerkar, Rupali Akerkar, Discrete Mathematics, Pearson Education

Additional

- RM Somasundaram, Discrete Mathematical structures
- Calvin C. Clawson, Mathematical Mysteries, The beauty and magic of Numbers, Viva Books Pvt Ltd.
- Rudra Pratap, Getting Started with MATLAB, Oxford University Press

Program- B.VOC	External-80
Branch-Information Technology	Internal-20
Paper -II	Total Marks- 100
Time-3hours	

NETWORK ADMINISTRATION

1. SYLLABUS

Module I: Network fundamentals and Data Communication: Local Area Network (LAN), Metropolitan Area Network (MAN), Wide Area Network (WAN), Wireless Networks, Internetworks: Data Communication: Channel capacity, Transmission media-twisted pair, coaxial cables, fiber-optic cables, wireless transmission, multiplexing, switching, narrowband ISDN, broadband ISDN, ATM, High speed LAN's, The Web and HTTP; File Transfer: FTP; Electronic Mail in the Internet: DNS-The Internet's Directory Service.

Module II: Transport Layer- Introduction and Transport-Layer Services, Multiplexing andDemultiplexing, Connectionless transport: UDP, Principles of Reliable Data Transfer, Connection-Oriented Transport: TCP, principles of Congestion Control, TCP Congestion Control, Networking Layer & Routing-Introduction and Network Service Model, Routing principles, Hierarchical Routing, Internetworking: Switch/Hub, Bridge, Router, Gateways, Concatenated virtual circuits, Fragmentation, firewalls. The Internet protocol, Routing and the Internet, What's Inside a Router, IPv6, Multicast Routing, Mobility and the Network Layer.

Module III: Link Layer- Data Link Layer: Introduction and Services, Error Detection and Correction Techniques, Multiple Access Protocols, LAN Addresses and ARP, Ethernet, Hubs, Bridges and Switches, Wireless links, PPP: The Point-to-point protocol, Asynchronous Transfer Mode (ATM), Frame Relay

Module IV: Network Security-cryptography-public key, secret key. Wireless & Mobility-Introduction to Wireless and Mobility. Wi-fi, Mobility principles, Cellular Telephony, mobile IP, Ad hoc Networks, Moving Beyond the Link Layer-An Interlude.

2. REFERENCES

- TCP/IP Network Administration by Craig Hunt
- The practice of System and Network Administration by Thomas A. Limon celli and Christina J. Hogan
- Windows XP Professional Network Administration (Networking Series) by Toby Volte

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Module 2: Conceptual Frame work: Accounting Concepts, Principles and Conventions, Accounting Standards

Module 3: Recording of transactions: Journals, Subsidiary Books, Ledger, Cash Book, Bank Reconciliation Statement, Trial Balance. Depreciation: Meaning, need & importance of depreciation, methods of charging depreciation.

Module 4: Preparation of final accounts: Preparation of Trading and profit & Loss Account and Balance Sheet of sole proprietary business with adjustments.

Module 5: Computerized Accounting: Journalizing and preparing final accounts using

TALLY

Program- B.VOC	External-80
Branch-Information Technology	Internal-20
Paper -III	Total Marks-100
Time-3hours	

OBJECT ORIENTED PROGRAMMING

3. **AIM:**

- To introduce the Student to the basic concepts of object orientation and impart skills in an industry standard object oriented language

4. **OBJECTIVES:**

On the completion of this course, the student will be able to

- ✓ Understand the concepts of classes and object
- ✓ Define classes for a given situation and instantiate objects for specific problem solving
- ✓ Reuse available classes after modifications if possible
- ✓ Possess skill in object oriented thought process

5. **SYLLABUS**

Module-I: Concept of Object orientation- why related data and methods should be kept as a single unit –comparison with procedural and structured programing – Classes and objects- data abstraction, encapsulation, inheritance, polymorphism, dynamic binding, message passing Advantages of object orientation-reusability, maintenance, security, comfort in programming. Input and output streams in C++; Basic data types and declarations.

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Module-II: Classes and objects in C++, access modifiers, **static members, friend functions, Constructors** and Destructors, polymorphism, Operator Overloading and **type conversion, anonymous objects**

Module-III: Inheritance- parent and child classes, private, public and protected inheritance, multiple inheritance and multi-level inheritance, Virtual base classes. C++ and memory models-new and delete operators, Heap, dynamic objects.

Module-IV:Binding & Polymorphism: Early binding, late Binding, pointers to derived class objects, **virtual functions, pure virtual functions, abstract classes,** object slicing, exception handing in C++: try, **throw and catch.**

REFERENCES

Core

- **Ashok N. Kamthane,** Object oriented programming with ANSI & Turbo C++, Pearson

Additional

- **H M Deitel and PJ Deitel,** C++: how to program, pearson Education
- **Robert Lafore, Object Oriented Pro**gramming in Turbo C++, Galgotia publications

Program- B.VOC	Externnal-40
Branch-Information Technology	Internal-10
Paper -IV	Total Marks-50
Time-3hours	

VISUAL TOOLS

1. AIM:

- ✓ To get an **exposure to visual language**

2. OBJECTIVES:

At the end of this course, **the students will be able to:**

- ✓ Give an introduction about visual basic
- ✓ **Explain the fundamentals of visual basic**
- ✓ **Discuss the various controls in visual basic**
- ✓ **Narrate database connectivity in visual basic**

3. SYLLABUS

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Module I: Introduction Visual Basic IDE- Menu bar, Tool bar, Tool Box, Form designer, Code Editor, Properties Window, Form Layout, Project Explorer, Immediate Window, Locals Window and Watch Window; Features in Visual Basic 6.0: The Language Object Based programming, Different Data Access models, Internet enabled features, Wizards. Visual Basic Language: Variables, constants, Data Types, User Defined Data Types, scope of Variables, - Life Time of a Variables, Naming Conventions in VB, Arrays, Dynamic Arrays, Collections, procedures,- Calling Procedures, Subroutines, Functions, calling Functions, Arguments, Named and positional arguments, Control flow Statements, Loop Statements, Exit Statement.

Module II: Visual Basic Standard ActiveX Controls & Objects: Standard Controls: Textbox, Checkbox, Combo Box, Option Button, Button, Massage Box, PictureBox, Image Control, Shape contro, System Controls, Timer Control, OLE container Contro, Common Dialogs control. Event driven programming and Events of Standard Active X Controls. i.e., TextBoxListBox, ComboBox etc.Creating Groups, Creating and adding project files. Standard EXE Project file, adding form file. Designing menu Objects.Single Document Interface and Multiple Documents Interface. Drag Drop Operations.

Module III: Input Validation: over view of validation field level validation, form level validation masking. Error handling: General Error handling in visual Basic, Built in VB Error Objects Error Types, Creating Error handlers. Compilation; P-code compilation, Native code Compilation, Conditional Compilation, Optimization.

Module IV: Database programming: Introduction to different databases. Data-bound controls. Data control, Data Access Object Model. Accessing Native Database with DAO, ODBC Connectivity to any RDBMS, Remote Data Access, remote Data Control, Accessing ODBC data base with RDO, Data Report Designer: Creating Data Reports, Various Types of Reports, ActiveX Data objects: Active Data Object Model, Uses of ADO Mode, Accessing ODBC, database with ADO. Object linking and Embedding: Overview of OLE, In place Activation, Creating OLE Servers. ActiveX Controls: Ms Flex Grid, Flex Grid, Image list Control, list View Control, Tool Bar, Status Bar etc.

REFERENCES

Core

- Halvorson, Microsoft visual basic 6.0 professional –Step by, PHI, Second Edition

Program- B.VOC	External-50
Branch-Information Technology	Internal-10
Paper -V(Practical)	Total Marks-50

VISUAL TOOLS LAB

The laboratory work may consist of 15-20 experiments covering the following topics

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1. Introduction to visual basic IDE- demonstration of various types of windows in IDE
2. Mouse, Keyboard, focus and Scroll events.
3. Demonstrate the syntax and use of various VB data types, operators and control structures
4. Demonstration and use arrays and its types- (static, dynamic and control arrays)
5. Implementation of Functions, Procedures and sub routines
6. Implementation of various standard activeX controls- Text box, list box check box combo box, option button, picture box, image box, timer, OLE control and message box
7. Programs to demonstrate various methods, events and properties of activeX controls
8. Program to implement the menu Editor
9. Implementation of Single and Multiple Document interface
10. Implementation of input validation (form and field level)
11. Implementation of Error handling in VB
12. Program to implement Data bound controls
13. Implementing ADO to access database.
14. Creating and generating data reports using report designer

Program- B.VOC	Externnal-40
Branch-Information Technology	Internal-10
Paper -VI(practical)	**Total Marks-50**

OOP & NETWORK LAB

1. AIM:

- To provide an opportunity for hands-on practice of object oriented programming and problem solving in a industry- standard programming language and also hands-on practice in various user-defined static and dynamic data structures.

2. OBJECTIVES:

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This course will provide hands-on practice in a the following topics, under a variety of programming situations with a focus on writing, debugging and analyzing object oriented programs :

- ✓ Basic data types and control structures in C++,
- ✓ Managing classes and objects in a variety of situation
- ✓ Solving moderately complex problems involving the above and requiring selection of appropriate structures and algorithms

3. SYLLABUS

The laboratory work will consist of 15-20 experiments, only by using class concept

Part A

1. Testing out and interpreting a variety of simple programs to demonstrate the syntax and use of the following features of the language: basic data types, operators and control structures.

2. Solving a problem using (i) structures and (ii) classes and comparison and comparison between the two (the problem logic and details should be kept minimal and simple to enable focus on the contrast between the two methods, for example declaring result of a set of students defining the name and total marks in the program itself).

3. Class definitions and usage involving variety of constructors and destructors

Part B

4. Programs involving various kinds of inheritances,

5. Programs involving operator overloading and type conversions

6. Programs involving virtual base classes, friend functions

7. Program to demonstrate early and late binding

8. Program to allocate memory dynamically

9. Program involving class and function templates

10. Programs to demonstrate (i) string processing (ii) file streams (iii) a variety of selected library functions

11. Exception handling

12. Handling of 2-D arrays using pointers

13. Debugging programs involving syntactic and/or logical errors

1. Programs using TCP Sockets (like date and time server & client, echo server & client, etc...)
2. programs using UDP Sockets (like simple DNS)
3. Programs using Raw sockets (like packet capturing and filtering)
4. Programs using RPC
5. Simulation of sliding window protocols
6. Experiments using simulators (like OPNET)
7. Performance comparison of MAC protocols
8. Performance comparison of Routing protocols
9. OPEN SHORTEST PATH FIRST ROUTING PROTOCOL
10. Study of TCP/ UDP performance

REFERENCES

- Deitel&deital, C++: How to program, pearson Education

MADHEPURA COLLEGE, MADHEPURA

Syllabus of Information Technology

SEMESTER-5

Program- B.VOC	Externnal-40
Branch-Information Technology	Internal-10
Paper -1	Total Marks-50
Time-3hours	

Intrduction to information Security

1. AIM:

- ✓ **Tointroduce internetworking** and the issues **and methods of information security** over internetworks.

2. OBJECTIVES:

On completion of this course student shall:

- ✓ **Be aware** of Principles and Protocols of internetworks
- ✓ **Understand** the basic issues in information security
- ✓ **Understand** the concept of ciphers and cryptography.
- ✓ **To impart** an idea on various ciphers
- ✓ **Understand** the concept of digital signatures and e-mail **security** policies
- ✓ **Impart an idea on** malicious software and remedies.

3. SYLLABUS

Module I:Information Security: Network security, Confidentiality, integrity, authentication, security policy, basic network security terminology, cryptography, symmetric encryption, substitution ciphers, transposition ciphers, steganography, Block ciphers, modes of operation, Data Encryption Standard, public key cryptography, application, strength and weakness, RSA algorithm, Key distribution(concepts only)

Module II: **Authentication,** authentication methods, message digest, digital signatures, digital signature algorithm, DSS E-mail security: Pretty Good privacy, working of PGP, S/MIME, MIME, IP Security, Architecture, IPSec: strengths and benefits, IPv4, IPv6, ESP protocol, Web Security: Secure Socket layer, SSL session and connection.

Module III: Malicious Software, viruses, working of anti-virus software, worms, Trojans, spyware, firewall, characteristics of firewall, packet filters, application level gateways , firewall architecture, trusted systes.

Module IV : Security and Law:- Regulations in India. Information Technology Act 2000/2008. Cyber Crime and the IT act 2000/2008. India Contract Act 1872, India penal Code, India copyright Act, Consumer Protection Act. Future Trends- The law of Convergence.

4. REFERENCES

4.1 Core

- Brijendrasingh, Cryptography & Network Security, PHI.
- Pachghare, V.K, Cryptography and information Security, PHI.

Program- B.VOC	Externnal-80
Branch-Information Technology	Internal-20
Paper VI	Total Marks-100
Time-3hours	

PROGRAMMING IN JAVA

1. AIM:

- To introduce students to basic features of java language and selected APLs

2. OBJECTIVES:

- ✓ Let students install and work with JDK, also make them aware the use of java doc.
- ✓ Practice basic data types, operators and control structures in Java

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- ✓ Practice basic handling of classes and objects in java
- ✓ Introduce the following selected APIs: I/O, Strings, Threads, AWT, Applet, Networking
- ✓ Idea to approach and use a new package

3. SYLLABUS

MODULE-I: Brief History of Java, Special Features of Java, data Type & Operators in Java, Arrays, Objects, the Assignment Statement, Arithmetic Operators, Relational and Logical Operators in Java, Control Structures, The Java Class, Constructor, simple Java Application, simple Java Applet, Finalizers, Classes inside Classes: composition.

Module-II: Inheritance & Interface,Deriving Classes, Method over-riding, Method Overloading, Access Modifiers, Abstract Class and

Method, Interfaces, Packages, Imports and Class Path.

Module-III: Exception Handling, The Try-Catch Statement, Catching more than one Exception, The finally Clause, Generating Exceptions, Threads: Introduction, Creating Threads in Applications, Method in Thread Class, Threads in Applets.

Module-IV: Java APIs- overview of APIs, IO Packages, Java Input Stream Classes, Java output stream classes, File Class, Graphic & sound: AWT and swing, Graphic methods, Fonts, Loading and Viewing Images, Loading and Playing Sound, AWT & Event Handling, Layouts, JDBC.

4.REFERENCES

4.2 Additional

- Deitel, Java: How To Program, Pearson Education

Madhepura College, Madhepura

(Affiliated to BNM University,Madhepura)

B.Voc. in Hardware & Networking (UGC)

B.VOC
In
HARDWARE AND NETWORKING
(UGC)

Program Outcomes:

- Learn the proper techniques of maintenance of hardware and networking devices
- Study the science of hardware and networking
- Diagnose and repair all major problems regarding hardware, PC peripheral devices
- Build your own book of business
- Work as a system administrator

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INTRODUCTION

The University Grants Commission (UGC) has launched a scheme on skills development based higher education as part of college/university education, leading to Bachelor of Vocation (B. Voc.) Degree with multiple exits such as Diploma/Advanced Diploma under the NSQF The B.Voc.programme is focused on universities and colleges providing undergraduate studies which would also incorporate specific job roles along with broad based general education. This would enable the graduates completing B.Voc.to make a meaningful participation in accelerating India's economy by gaining appropriate employment, becoming entrepreneurs and creating appropriate knowledge.

The proposed vocational programme in Software Development will be a judicious mix of skills, professional education related to Software Development and also appropriate content of general education. It is designed with the objective of equipping the students to cope with the emerging trends and challenges in the Software Development environment.

PROGRAMME STRUCTURE

The B.Voc Computer Hardware and Networking shall include:

- Language courses (English)
- General Education Components
- Skill Components
- Project
- Industrial Training
- Soft Skills and Personality Development Programmes

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Course Structure

Semester-I

Course Name	G.C./S.C.	Credits	Marks Distribution		Total
			Internal	External	
PC Hardware	G.C.	4	20	80	100
Computer Networking	G.C.	4	20	80	100
Communicative Skills	G.C.	4	10	40	50
Basic IT Skills	S.C.	6	10	40	50
PC Hardware Lab	S.C.	6	10	40	50
Computer Networking Lab	S.C.	6	10	40	50

Semester-II

Course Title	G.C./S.C.	Credits	Marks Distribution		Total
			Internal	External	
Database Management Systems	G.C.	4	20	80	100
Operating System	G.C.	4	20	80	100
Microprocessor & Interfacing	G.C.	4	20	80	100
IT Service Management	S.C.	6	20	80	100
Database Management Systems Lab	S.C.	6	10	40	50
Operating System Lab	S.C.	6	10	40	50

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Semester-III

Course Title	G.C./S.C.	Credits	Marks Distribution		Total
			Internal	External	
Information & Network Security	G.C.	6	20	80	100
LINUX OS	G.C.	6	20	80	100
IT Foundation and Programming Concepts	S.C.	6	20	80	100
Information & Network Security Lab	S.C.	6	10	40	50
Linux OS Lab	S.C.	6	10	40	50

Semester-IV

Course Name	G.C./S.C.	Credits	Marks Distribution		Total
			Internal	External	
Programming in C	G.C.	6	20	80	100
BUSINESS ANALYSIS : ENVIRONMENT, SALES & MARKETING	G.C.	6	20	80	100
COMPUTER HARDWARE, PC ASSEMBLING & TROUBLE SHOOTING	S.C.	6	20	80	100
Programming in C Lab	S.C.	6	10	40	50
COMPUTER HARDWARE, PC ASSEMBLING & TROUBLE SHOOTING Lab	S.C.	6	10	40	50

Semester-V

Course Title	G.C./S.C.	Credits	Marks Distribution		Total
			Internal	External	
Entrepreneurship development	G.C.	8	20	80	100
Mobile Computing	G.C.	8	20	80	100
Internet Routing Design	G.C.	8	20	80	100
Project	S.C.	6	20	80	100

Semester-VI

Course Title	G.C./S.C.	Credits	Marks Distribution		Total
			Internal	External	
Industrial Training/Project	S.C.	24	0	200	200
Project Seminar	G.C.	06	0	100	100

- G.C. – General Component
- S.C. – Skill Component

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Semester I

Course Name	Marks Distribution		Total
	Internal	External	
PC Hardware	20	80	100
Computer Networking	20	80	100
Communicative English	10	40	50
Basic IT Skills	10	40	50
PC Hardware lab	10	40	50
Computer Networking Lab	10	40	50

Course Name : PC Hardware

Program : B.Voc	Internal max. marks: 20
Branch : Hardware & Networking	External max. marks:80
Semester: I	Total marks: 100
Paper-01	Time-3hours

Detailed contents
Unit 1: **Assemble/setup and upgrade personal computer** systems: computer system modules/ components and **its operations, need of hardware and software for** computer to work, **different hardware components within a computer and connected to a computer as** peripheral devices, type of computer, bus structures, **different processors used for personal computers and** note book computers.
Unit 2: **Perform installation, configuration, and upgrading of** microcomputer: Hardware and software **requirement, Assemble/setup microcomputer systems**, accessory boards, types of motherboards, **selection of right motherboard, Installation** &replacement of motherboard, troubleshooting problems with memory.
Unit 3: **Install/connect associated peripherals: Working** of printers and scanners, **Installation of printers and scanners, sharing a printer over a local area network:**, troubleshooting **printer and scanner problems,** troubleshooting hard drive problems.
Unit 4: **Diagnose and troubleshooting of** microcomputer systems **hardware & software and other peripheral equipment: Approaches to** solve a PC problem, **troubleshooting a failed boot before the OS is loaded,** different approaches to installing and supporting I/O device, managing faulty components.

Suggested Readings :

1. PC Hardware: The Complete Reference, **McGraw-Hills**
2. The Indispensable PC Hardware Book **(4th Edition)** Hans-**Peter Messmer**
3. PC Hardware: A Beginner's Guide **by Ron Gilster**

Course Name : Computer Networking

Program : B.Voc	Internal max. marks: 20
Branch : Hardware & Networking	External max. marks:80
Semester:I	Total marks: 100
Paper-II	Time-3hours

Detailed contents
Unit 1: Data Communications Concepts. Digital and analog transmissions-Modem, parallel and serial, synchronous and asynchronous, Modes of communication: Simplex, half duplex, full duplex, Concept of multiplexing, De-multiplexing. Types of Networks. LAN, MAN, WAN Network Topologies: Bus, Star, Ring, Mesh, Tree, Hybrid Communication Channels: Wired transmissions: Telephone lines, leased lines, switch line, coaxial cables-base band, broadband, optical fiber transmission
Unit 2: Transmission Media: Guided Media(Twisted Pair Cable, Coaxial Cable, Fiber Optics Cable), Unguided Media (Radio Waves, Microwaves, Infrared) Communication Devices (Switches, Hub, Routers, gateway etc) Introduction to Switching: Circuit Switch Networks, Datagram Switch Networks Network Models:
Unit 3: Introduction to OSI Model – Physical Layer, Data Link Layer, Network Layer, Transport Layer, Session Layer, Presentation Layer, TCP/IP (Layer Architecture) Data Link Layer, Internet Layer, Transport Layer, Application Layer
Unit 4: MAC sub layers 802.4Token Bus, IEEE 802.5 Token Ring Concept of Internetworking.

Suggested Readings:

1. Computer Networks, Tanenbaum, Andrew, Fifth Edition, PHI
2. Data Communication and Networking, Behrouz A. Forouzan, Fourth Edition
3. Computer Today, S.K. Basandra, First Edition, Galgotia
4. Data Communication System, Black, Ulysse, Third Edition, PHI
5. Data and Computer Communications, Stalling, Ninth Edition, PHI

Course Name: Communication Skills

Program : B.Voc	Internal max. marks: 10
Branch : Hardware & Networking	External max. marks:40
Semester: 1st	Total marks: 50
Paper-III	Time-3hours

Detailed contents
Unit 1: (Introduction) • Theory of Communication, • Types and modes of Communication
Unit 2: (Language of Communication) • Verbal and Non-verbal • (Spoken and Written) • Personal, Social and Business • Barriers and Strategies • Intra-personal, Inter-personal and Group communication
Unit 3 (Reading and Understanding) • Close Reading • Comprehension • Summary Paraphrasing • Analysis and Interpretation • Translation(from Hindi/Punjabi to English and vice-versa • Literary/Knowledge Texts
Unit 4: (Writing Skills) • Documenting • Report Writing • Making notes • Letter writing

Suggested Readings:

1. Fluency in English – Part II, Oxford University Press. 2006.
2. Business English, Pearson, 2008.
3. Practical English Usage. Michael Swan. OUP. 1995.
4. Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press. 2011.
5.Exercises in Spoken English

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Course Name : Basic IT Skill

Program : B.Voc	Internal max. marks: 10
Branch : Hardware & Networking	External max. marks:40
Semester: 1st	Total marks: 50
Paper-IV	Time-3hours

Detailed contents
Unit 1: Human Computer Interface Concepts of Hardware and Software; **Data and Information**. Functional Units of Computer System: CPU, registers, **system bus**, main memory unit, cache memory, **SMPS, Motherboard, Ports** and Interfaces, expansion cards, ribbon cables, memory **chips, processors. Devices**: Input and output devices, keyboard, mouse, joystick, **scanner, OCR, OMR, bar code reader, web camera,** monitor, printer, plotter. Memory: Primary, secondary.
Unit 2: Concept of Computing & PC Software– I **Concept** of Computing. Types of Languages: Machine, assembly and High level **Language. Operating** system as user interface, utility programs. **Word processing:** Editing features, formatting features, saving, printing, table **handling, page settings,** spell-checking, macros, mail-merge, and equation editors.
Unit 3:PC Software – II Spreadsheet: Workbook, worksheets, data types, operators, cell formats, freeze panes, editing features, formatting features, creating formulas, using formulas, cell references, replication, sorting, filtering, functions, Charts & Graphs. Presentation Graphics Software: Templates, views, formatting slide, slides with graphs, animation, using special features, presenting slide shows.
Unit 4: The Impact of Computing and **the Internet on Society** Electronic **Payment System: Secure** Electronic Transaction, **Types of Payment** System **Digital Cash, Electronic Cheque,** Smart Card, **Credit/Debit Card EMoney,** Immediate **Payment System** (IMPS).

Suggested Readings:

1. **Introduction to Information Technology, ITL Education** Solutions **limited, Pearson Education**
2. **Computer Fundamentals**, A. Goel, 2010, **Pearson Education**.
3. **Fundamentals of Computers**, P. K.Sinha& P. **Sinha**, 2007, **BPB Publishers**.
4. **IT Tools, R.K. Jain,** Khanna Publishing House
5 **"Introduction to Information Technology", Satish Jain, Ambrish Rai & Shashi Singh, Paperback Edition, BPB Publications, 2014**

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Officer on Special Duty (Judicial)

Course Name: PC Hardware Lab

Program : B.Voc	Internal max. marks: 10
Branch : Hardware & Networking	External max. marks:40
Semester: I	Total marks: 50
Paper-V	Practical

Task 1	Assembling and De Assembling of Computer System
Task 2	**Loading and configuration procedure of** Microsoft Client O/S Win XP /**Win 7 and Windows 8**
Task 3	**Installation of utility tools** (Software and Drivers)
Task 4	Firewall configuration, Antivirus/Internet security loading and configuration procedure.
Task 5	Installation and configuration of , I/O devices – Printers , Webcams , Scanners, Digital Camera , USB Wifi , USB BT, USB Storage , Projector
Task 6	Multiple OS loading and trouble shooting

Course Name: Computer Networking Lab

Program : B.Voc	Internal max. marks: 10
Branch : Hardware & Networking	External max. marks:40
Semester: I	Total marks: 50
Paper-VI	Practical

Task 1	Preparing Computer Network Cable using Connectors and Networking tools
Task 2	**LAN & WAN Connectivity** using Hub, Switch and Router
Task 3	Installation of Windows and Server
Task 4	Sharing peripheral devices
Task 5	Configuration of Network Connectivity
Task 6	Troubleshooting of Computer Hardware and Network

SEMESTER- II

Course Title	Marks Distribution		Total
	Internal	External	
Database Management Systems	20	80	100
Operating System	20	80	100
Microprocessor & Interfacing	20	80	100
IT service Management	20	80	100
Database Management Systems Lab	10	40	50
Operating System Lab	10	40	50

Course Name : Database Management System

Program : B.Voc	Internal max. marks: 20
Branch : Hardware & Networking	External max. marks:80
Semester: II	Total marks: 100
Paper-I	Time-3hours

Detailed contents
Unit 1: Introduction of DBMS, Data Modeling for a Database, Three-level Architecture of DBMS, Components of a DBMS. Introduction to Data Models, Hierarchical, Network and Relational Model, Comparison of Network, Hierarchical and Relational Model. Entity Relationship Model.
Unit 2: Relational Database, Relational Algebra and Calculus, SQL Fundamentals, DDL, DML, DCL, PL/SQL Concepts, Cursors, Stored Procedures, Stored Functions, Database Triggers.
Unit 3: Introduction to Normalization, First, Second, Third Normal Forms, Dependency Preservation, Boyce-Codd Normal Form, Multi-valued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form, Domain-key normal form (DKNF).
Unit 4: Database Recovery, Concurrency Management, Database Security, Integrity and Control. Structure of a Distributed Database, Design of Distributed Databases.

Suggested Readings:

1 "SQL, PL/SQL The Programming Language of Oracle", Ivan Bayross, BPB Publications, 4th Revised Edition (2009)

2. "An Introduction to Database Systems", C. J. Date, A Kannan, S. Swamynathan, 8th Edition, Pearson Education, (2006).

3. "Database System Concepts", Abraham Silberschatz, Henry F. Korth, S Sudharshan, Tata McGraw Hill, 6th Edition, (2013).

4. Database Management Systems, Raghu Ramakrishnan, McGraw-Hill, Third Edition, 2014.

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Course Name : Operating System

Program : B.Voc	Internal max. marks: 80
Branch : Hardware & Networking	External max. marks: 20
Semester: II	Total marks: 100
Paper-II	Time-3hours

Detailed contents
Unit 1 Types of operating systems – Simple Batch Systems, Multiprogramming, Time Sharing systems, Personal computer systems, Parallel systems, Distributed Systems, Real – Time System, Multiprocessing, online & offline processing. Command Line Operating Systems, GUI Operating Systems, Selecting an OS
Unit 2 Disk Operating System, Booting Process, Warm and Cold Booting, DOS disk structure, DOS booting sequence, Systems files, Autoexec and Config files. Internal & External DOS commands. Directory commands: DIR, MD, RD} TREE, PATH, SUBST. file management Commands: COPY, DEL, ERASE, REN, ATTRIB, XCOPY, BACKUP and RESTORE, Format, FDISK, General commands: TYPE DATE, TIME, PROMT. Other commands.- Chkdsk, Defrag, Diskcomp, Doskey, Edit, Label, Mem, Mode, More, Move, Scandisk, Tree, Undelete, Xcopy, Attrib, Deltree, Format, Sys, Fdisk, Diskcopy.
Unit 3: Windows OS Booting Process, Dual Booting, Alternative Windows Startup Modes, Displaying the Startup Menu, Making a Windows Startup Disk, Windows Recovery Console. Windows Tools and Utilities, Installing and Removing Applications, Adding and Removing Windows Components, Using a Command Prompt, Installing New Devices, Plug and Play Devices, Non-Plug and Play Devices, Removing Devices, Resolving Resource Conflicts, Precautions to Avoid Viruses, Detecting and Removing Viruses, Correcting Windows Problems, Working without a Mouse.
Unit 4: Linux overview, File systems and structure of directories and file, File Oriented Commands – Cat, cp, ln mv, rm .File Permissions, Directory Oriented commands – ls, mkdir, rmdir, cd, pwd ., Inter user connection commands – write, mail, used, at, wall ., Common commands – kill, date, wc, sleep, who, ps.

Suggested Readings:

1. Modern Operating Systems 2nd Edition – Tanumbaum (PHI)
2. Teach Yourself Windows 95 – Gini Courter
3. Using Linux – Tackett, Burnett (PHI)
4. Operating System Concepts – Silberschatz S. IT Today – S. Jaiswal.

Course Name: Microprocessor & Interfacing

Program : B.Voc	Internal max. marks: 80
Branch : Hardware & Networking	External max. marks:20
Semester: II	Total marks: 100
Paper-III	Time-3hours

Detailed contents
Unit -1 Evolution of Microprocessor and types, Silent features of 8085 Microprocessor, architecture of 8085 (Block diagram), pin diagram, register organization, limitations of 8-bit Microprocessor,8085 interrupt structure. Silent features of 8086 Microprocessor, architecture of 8086 (Block diagram, signal description), register organization, concepts of pipelining,
Unit- 2 Concept of Machine Language, Instruction format, addressing modes,Instruction set (Arithmetic, logical, data transfer, bit manipulation, string, program control transfer, process control) Assembly Language Programming Tools Editors, Assembler, Linker, Debugger,Assembler directives, model of 8086 assembly language programming, programming using assembler
UNIT-3 Defining Procedure (Directives used, FAR and NEAR, CALL and RET instructions) 5.2 Defining Macros. 5.3 Assembly Language Programs using Procedure and Macros. 5.4 DOS interrupt services.
Unit -4: Interfacing Techniques (I/O mapped I/O, Memory mapped I/O, memory and I/O addressing, 8086 addressing, and address decoding, memory interfacing as Even and Odd bank) 6.2 Interfacing 8255, Block diagram, modes of operation. 6.3 8259: Block diagram, Characteristics and function only. 6.4 8257/8237: Block diagram, Characteristics and function only.

Vinod Kumar Tiwari
Officer on Special Duty (Academic)

Suggested Readings:

1.Microprocessor Architecture, Programming and Applications with 8085" by R S Gaonkar
2 The 8051 Microcontroller, Architecture, Programming and Applications" by Kenneth J Ayala
3. D.V. Hall, *"Microprocessors and Interfacing"*,2nd Edition McGraw-Hill Book Company
4.M.A Mazidi and J.G. Mazidi, *"The 8051 Microcontroller and Embedded Systems"*, Pearson Education, India

Course Name : IT Service Management

Program : B.Voc	Internal max. marks: 80
Branch : Hardware & Networking	External max. marks:20
Semester: II	Total marks: 100
Paper-IV	Time-3hours

Detailed contents
Unit 1-INFORMATION SYSTEMS 1.1 Information systems components 1.2 Organisations and management 1.3 The information system as a sociotechnical system 1.4 The strategic use of Information Technology
Unit 2-MANAGEMENT INFORMATION SYSTEMS 2.1 Informational needs of organisations 2.2 Capabilities of information systems from an organisational perspective 2.3 Information requirements for management 2.4 Levels of planning and control with MIS 2.5 MIS support for business functions 2.6 Management reporting processing systems
UNIT3- SYSTEMS AND MANAGEMENT CONCEPTS 3.1 Systems approach, organisational design, MIS in organisational control e.g. feedback etc. 3.2 Management theory and management functions 3.3 Concepts of planning 3.4 Role of information systems in the planning process (e.g. modelling and forecasting)

Vinod Kumar Tiwari
Officer on Special Duty (Acad.)

3.5 Using MIS to enhance management control. performance reports, break-even analysis, calculation of financial ratios e.g. return on investment
Unit 4-MANAGERIAL DECISION MAKING 4.1Decision-making 4.2 Components of Decision Support Systems 4.3 Types of DSS 4.4 Building a DSS 4.5 Executive Information Systems 4.6 Organisational aspects of DSS and EIS

Suggested Readings:

1.Service Management, Fourth Edition, J A Fitzsimmons and M J Fitzsimmons, McGraw Hill.
2.Services Marketing, Valerie Zeithaml, Mary Jo Bitner, and Dwayne Gremler, McGraw-Hill.
3.Introduction to Operations Research, Hillier and Lieberman
4.Service modeling. Principles and Applications. Vilho Räisänen, Wiley.
5.Understanding Service Business, S.E. Sampson, Wiley.

Course Name: Database Management Systems Lab

Program : B.Voc	Internal max. marks: 10
Branch : Hardware & Networking	External max. marks:40
Semester: II	Total marks: 50
Paper-V	Practical

Task 1	Used of CREATE, ALTER, RENAME, INSERT INTO, DELETE,UPDATE and DROP statement in the database tables
Task 2	Use of simple select statement, select query, aggregate functions
Task 3	Use of substring comparison.
Task 4	Use of nesting of queries
Task 5	Use of order by statement.
Task 6	Consider the following schema for a Library Database: BOOK (Book_id, Title, Publisher_Name, Pub_Year) BOOK_AUTHORS (Book_id, Author_Name) PUBLISHER (Name, Address, Phone) BOOK_COPIES (Book_id, Branch_id, No-of_Copies) BOOK_LENDING (Book_id, Branch_id, Card_No, Date_Out, Due_Date) LIBRARY_BRANCH (Branch_id, Branch_Name, Address) Write SQL queries to 1. Retrieve details of all books in the library_id, title, name of publisher, authors, number of copies in each branch, etc.

Course Name: Operating System Lab

Program : B.Voc	Internal max. marks: 10
Branch : Hardware & Networking	External max. marks:40
Semester: II	Total marks: 50

Paper-VI	Practical

Task 1	**Execution of internal and external DOS** commands
Task 2	Managing the Boot manager and Installation of Windows OS.
Task 3	Working **with Windows Tools and utilities** and Installation of devices.
Task 4	Installing and Un-installation of Windows components.
Task 5	**Installation and un-installation of different** applications.
Task 6	Study **of File systems of Linux and** Execution of different linux commands.

Semester III

Course Title	Marks Distribution		Total
	Internal	External	
Information & Network Security	20	80	100
LINUX OS	20	80	100
IT foundation and Programming Concepts	20	80	100
Information & Network Security Lab	10	40	50
Linux OS Lab	10	40	50

Vinod Kumar Tiwari
Officer on Special Duty (Jr. Cal)

Course Name : Information & Network Security

Program : B.Voc	Internal max. marks: 80
Branch : Hardware & Networking	External max. marks:20
Semester: III	Total marks: 100
Paper-I	Time-3hours

Detailed contents
Unit 1 Introduction Management of **malicious intent, threat** scenarios, **critical infrastructures, security targets** and policies, security mechanisms, examples of applications **and their different security requirements,** multi-lateral security, privacy and data protection, computer **misuse legislation,** Operating system and network security, Cyber laws.
Unit 2 **Network Layer Security Routing algorithm vulnerabilities: route and sequence number spoofing, instability and resonance effects. Information hiding:** DMZ networks, **route aggregation and segregation ICMP redirect hazard: denial of service.** ARP **hazard: phantom sources,** ARP **explosions and slow links** Move, Scandisk, Tree, Undelete, Xcopy, Attrib, Deltree, Format, Sys, FDisk, DiskCopy.
Unit 3:

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Firewalls Network partitioning, firewall platforms, partitioning models and methods, Secure SNMP, Secure routing interoperability: virtual networks (DARTnet/CAIRN). Transparent and opaque network services. Source masking and hidden channels
Unit 4:
Security in Wireless Networks: How it is different, Methods and procedures, MIN/ESN, shared secret data authentication, Token based, public key based.

Suggested Readings:

1. Stallings, W , "Cryptography and Network Security: Theory and Practice", Second Edition, John Wiley
2. Schneier, B., "Applied Cryptography – Protocols, Algorithms, and Source Code in C", Second Edition, John Wiley and Sons, 1995
3. Stem L., "Web Security: A Step-by-Step Reference Guide", Addison Wesley Longman, Inc., 1998
4. Anderson R., "Security Engineering: A Guide to Building Dependable Distributed Systems", Wiley
5. Cheswick W., Bellovin S. , "Firewalls and Internet Security: Repelling the Wily Hacker", 2nd ed , Addison-Wesley

Course Name : LINUX OS

Program : B.Voc	Internal max. marks: 80
Branch : Hardware & Networking	External max. marks:20
Semester: III	Total marks: 100
Paper-II	Time-3hours

Detailed contents
Unit 1 Linux introduction – Basic features, Different flavors of Linux. Advantages, Installing requirement, Basic Architecture of Unix/Linux system, Kernel, Shell. Linux File system-Boot block, super block, Inode table, data blocks, How Linux access files, storage files, Linux standard directories.
Unit 2 Installation of Linux system- Partitioning the Hard drive for Linux, Installing the Linux system, System startup and shut-down process, init and run levels. Essential Linux commands Understanding shells, Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less, creating and viewing files using cat, file comparisons – cmp & comm, View files, disk related commands, checking disk free spaces
Unit 3: Processes in Linux-process fundamentals, connecting processes with pipes, tee, Redirecting input output, manual help, Background processing, managing multiple processes, changing process priority with nice,

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Officer on Special Duty (Technical)

scheduling of processes at command, cron, batch commands, kill, ps, who, sleep, Printing commands, find, sort, touch, file, file related commands-ws, sat, cut, dc,
Unit 4: Backup and restore files, reconfiguration hardware with kudzu, installaing and removing packages in Linux. Configure X-windows starting & using X desktop KDE & Gnome graphical interfaces, changing X windows settings. Setting up and using telnet server and clients. Installation and simple configuration of Proxy Server – Squid, Mail server – Sendmail, Web server – Apache, File server and Samba server in linux VNC server and client setting

Suggested Readings:

1.UNIX – Concepts & Applications (Third Ed.) – Sumitabha Das, Tata McGraw Hill Publications. 2. Unix for programmers and users (Third Ed.) – Graham Glass & King Ables, Pearson Education

Course Name: IT foundation and Programming Concepts

Program : B.Voc	Internal max. marks: 80
Branch : Hardware & Networking	External max. marks:20
Semester: III	Total marks: 100
Paper-III	Time-3hours

Detailed contents
Unit 1-Computer System Characteristics And Capability – Basic structure, ALU, memory, CPU, I/O devices. Development of computers. Classification of computers(Micro, mini frame, super computer, pc, server, workstations), BIT, BYTE, WORD, ASCII, EBCDIC, BCD Code. Introduction to Number system: Binary, Octal, Decimal and Hexadecimal. Conversation from one number system to another number system. Introduction to Basic Gates.
Unit 2-Input Devices and Output Devices –

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Officer on Special Duty (Judicial)

Keyboard, Direct Entry: Card readers, scanning devices (BAR CODE, OMR, MICR), Voice input devices, Light pen, Mouse, Touch Screen, Digitizer, scanner. CRT, LCD/TFT, Dot matrix printer, Inkjet printer, Drum plotter, Flatbed plotter
Unit 3: Memory Devices – RAM, ROM, PROM, EPROM, EEPROM. – Base memory, extended memory, expanded memory, Cache memory – Storage devices Tape, FDD, HDD, CDROM, Pen Drive
Unit 4: Introduction To Programming Environment- Definition and properties, Principles of flowcharting, Flowcharting symbols, Converting algorithms to flowchart, History of languages, high-level, Low level, Assembly languages etc., Compilers, Interpreters, Assemblers, Linkers, Loaders

Suggested Readings:

R. Hunt And Shell Y. "Computers And Commonsense" BPB Publications
V.Rajaraman "Computer Fundamentals" PHI Learning
Ashok Arora "Fundamentals of Computer Systems"
Russell A Stultz "Fundamentals of Computer Systems"

Course Name: Information & Network Security Lab

Program : B.Voc	Internal max. marks: 10
Branch : Hardware & Networking	External max. marks:40
Semester: III	Total marks: 50
Paper-IV	Practical

Task 1	Study of Cyber laws I and II.
Task 2	Implementation & Configuration of firewalls
Task 3	Creation and Implementation of Standard ACL
Task 4	Creation and Implementation of Extended ACL
Task 5	Creation and Implementation of Named ACL
Task 6	Implementing wireless security using SSID

Course Name: Linux OS LAB

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Program : B.Voc	Internal max. marks: 10
Branch . Hardware & Networking	External max. marks 40
Semester III	Total marks: 50
Paper-V	Practical

Task 1	Study of File systems of Linux.
Task 2	Study of Partitions of Linux.
Task 3	Booting in Linux.
Task 4	Standard Linux installation.
Task 5	Setting up Mail server and Web server.
Task 6	Installation of packages.

Semester IV

Course Name	External	Internal	Total
Programming in C	20	80	100
BUSINESS ANALYSIS: ENVIRONMENT, SALES & MARKETING	20	80	100

COMPUTER HARDWARE, PC ASSEMBLING & TROUBLE SHOOTING	20	80	100
Programming in C Lab	10	40	50
COMPUTER HARDWARE, PC ASSEMBLING & TROUBLE SHOOTING Lab	10	40	50

Course Name : Programming in C

Program : B.Voc	Internal max. marks: 80
Branch : Hardware & Networking	External max. marks:20
Semester: IV	Total marks: 100
Paper-I	Time-3hours

Vinod Kumar Tiwari
Officer on Special Duty (Technical)

Detailed contents
Unit 1-Introduction and Basic elements of C programming Introduction to problem solving through algorithm and flowchart, Overview, Character set, Keywords and Identifiers, Constants and Variables, Data types, Operators and Expressions, Operator precedence and associativity, Type casting
Unit 2-Data I/O, Control Structures- Basic structure of C program, Formatted and Unformatted Input and Output, Conditional branching – if, switch statement, iterative loops – while, do while and for statement, break and continue statement, goto statement.
Unit 3: Arrays Functions- Introduction, Declaration and Initialization, Accessing Array elements, Memory representation of Array, One dimensional Arrays, Two dimensional Arrays ,Character Arrays and Strings, Standard Library Functions, User Defined Functions (UDF) – Declaration, Definition, Function call, Parameter Passing – by value and by reference, Recursion, Storage Classes.
Unit 4: Structure, Union and Pointers- Defining Structure, Declaration, Initialization, Array of Structures, Structure and Functions, Nested Structures, Unions, Enumerated data type, typedef, Pointers and Dynamic Memory Allocation

Suggested Readings:

YashavantKanetkar" Let us" C BPB Publication

E. Balagurusamy "Programming in ANSI C" Tata McGraw Hill

Byron Gottfried "Programming with C" Tata McGraw Hill

YashavantKanetkar "Exploring C" BPB Publication

Course Name: BUSINESS ANALYSIS: ENVIRONMENT, SALES & MARKETING

Program : B.Voc	Internal max. marks: 80
Branch : Hardware & Networking	External max. marks:20
Semester: IV	Total marks: 100
Paper-II	Time-3hours

Detailed contents

Vinod Kumar Tiwari
Officer on Special Duty (Acad)

Unit 1-Business Environment - Introduction, Concept of Business, Levels of the Business Environment, Understanding the Environment, Economic Environment of Business, The Global Economic Environment, Economic Policies, Business and Economic Policies, Socio Cultural Environment, Business and Society, Business and Culture , Indian Business Culture, Culture and Organizational Behavior. Introduction to Political Environment, Political Environment and the Economic system, Types of Political Systems, Indian Constitution and Business, Changing Profile of Indian Economy , Business Risks Posed by the Indian Political System, Economic Systems, Financial Environment: Introduction, An Overview of the Financial System, Components of Financial System, Financial Institutions and their Roles, Financial Institutions in India, Role of Foreign Direct Investment

Unit 2-Introduction to Legal Environment, Laws Impacting Industry in India, Intellectual Property Rights, Major Regulations Pertaining to Business, Regulatory Role of Government, Promotional Role of Government, Participatory Role of Government, Consultatory and Judicial Role of Government , Impact of India's Industrial Policy on Economic Reforms, New Economic Policy, Globalization. India, WTO and Trading Blocs, Levels of Economic Integration/Trading Blocs, Effects of Economic Integration, Major Regional Trading Blocs, Commodity Agreement, World Trade Organization, WTO and India, Corporate Social Responsibility: Introduction, Meaning and Definition, Need for social responsibility of business, Social responsibility of business towards different groups, Barriers to social responsibility, Social responsibility of business in India, Public, Private, Joint and Cooperative Sector

Unit 3: Segmentation & its implication. Concept of Product, Product Planning and Development; Packaging: Role and Functions; Brand name and Trade mark; Product Life Cycle Concept; Distributions Channels and Physical Distribution. Price: Importance of Price in the Marketing Mix; Factors affecting Price of a Product/Service; Discounts and Rebates; Methods of Promotion; Advertising Media; Characteristics of an effective Advertisement

Unit 4: Scientific Selling, Approach and Presentation: Methods of Approaching a Customer; Presentation Process and Styles; Presentation planning. Objection Handling: Types of objections; Handling customer objections. Closing Sales and Follow up: Methods of closing sale; Executing sales order; Follow-up; Sales Promotion Schemes: Sampling; Coupon; Price Off, Premium Plan; Consumer Contests and Sweeps Takes; POP Displays; Demonstration; Trade Fairs and Exhibitions; Sales Promotion Techniques and Sales Force.

Suggested Readings:

1.Business Environment; By Vishwajeet Prasad, Gyan Publishing House.
2.Business Environment; By Saleem, Pearson Education India.
3 BUSINESS ENVIRONMENT; By VEENA KESHAV PAILWAR, PHI Learning Pvt. Ltd.
4.Business Environment, by Suresh Bedi, Excel Books
5.BUSINESS ENVIRONMENT: INDIAN AND GLOBAL

Vinod Kumar Tiwari
Officer on Special Duty (Academic)

Course Name: COMPUTER HARDWARE, PC ASSEMBLING & TROUBLE SHOOTING

Program : B.Voc	Internal max. marks: 80
Branch : Hardware & Networking	External max. marks:20
Semester: IV	Total marks: 100
Paper-III	Time-3hours

Detailed contents
Unit 1-system Case. Plan System Layout. Install Hard Disk Drive/DVD-RW Drive. Configure **Motherboard. Install Processor. Install Memory Modu**les/Motherboard/I/O Port Connectors/PS/2 **Mouse Port Connector Connect Motherboard and Case** Connect Hard Disk Drive/DVD-RW Drive to **Motherboard. Install Video Card. Perform Post-Assembly** Inspection. Connect External Peripherals. **Perform Initial Boot/Initial BIOS** Setup/Install System Tools/Additional Peripherals. **Partition and Format Hard Disk. Complete A**ssembly. Installation of Windows (Client version). Installation and configuration of driver software. Installation of Linux (Client version).**Updating Service Pack of O. S. Installation of Anti Virus Software**(Well known) Updating Anti Virus Software
Unit 2-Problems: Wired mouse and wireless mouse both. Desktop & Laptop that shut down without **warning are often** experiencing overheating issues. Troubleshooting **for Desktop& Laptop Hard Drive Failure, Date and Time** problem, No power etc. RAM failure.
Unit 3: Start, Unable to Connect to the Wireless Network(for Laptop).**System restarts without warning. Fix the** Windows blue screen errors. Not a valid win32 application. **How to fix a fatal exception error. How to fix a general** protection fault Runtime errors. Trouble **shoots for Virus affected systems. Suspicious computer** _ehavior such as high CPU usage on **unrecognized processes. Unable to access network resources such** as shared drives. Internet Explorer **home page is changed without permission** Exploring error for drives.
Unit 4: software program. Trouble shoots for Network problems. **Bad network** card drivers or software settings. Firewall preventing computers from seeing each other. **Connection related** issues. Bad network hardware. Connection IP conflict problem etc. Internet Configuration Different **types of** internet connection and their configuration method. Broad band connection (ADSL and **Cable** etc.) Webcam installation. Troubleshoot while configuring internet

Suggested Readings:

Mastering PC Hardware & Network, **Dr. Ajit Mittal, Dr. Aja**y **Rana**
How Computers Work, Ron White
Modern TFT & LCD **Monitor Introduction and Troublesh**ooting, BPB Publication
Service Manual Mother Board & Laptop, GT Publication □
Fundamental of **Computer, V. Rajaraman**

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Course Name: Programming in C Lab

Program : B.Voc	Internal max. marks 10
Branch : Hardware & Networking	External max. marks:40
Semester: IV	Total marks: 50
Paper-IV	Practical

Task 1	**Programs based on input output statements**
Task 2	Programs based on various operators and control statement (if, switch)
Task 3	Programs based on various loops (for, while, do-while)
Task 4	Programs based on 1-D Array and on 2-D Array
Task 5	Programs based on Function
Task 6	**Programs based** on Pointer, Array, Function ,Structure and Union

Course Name : COMPUTER HARDWARE, PC ASSEMBLING & TROUBLE SHOOTING Lab

Program : B.Voc	Internal max. marks: 10
Branch : Hardware & Networking	External max. marks:40
Semester: IV	Total marks: 50
Paper-V	Practical

Task 1	Prepare System Case for Assembly and Checking SMPS **and fit with system Case.**
Task 2	Plan System Layout and Install Hard Disk Drive/DVD-RW Drive.
Task 3	Configure Motherboard and Install Processor
Task 4	Install Memory Modules/Motherboard/I/O Port, Connectors/PS/2 **Mouse Port Connector Connect** Motherboard and Case,Connect Hard Disk Drive/ DVD-
Task 5	Install Video **Card,Perform Post-Assembly** Inspection, Connect External Peripheral andPerform Initial Boot/Initial BIOS
Task 6	**Partition and Format** Hard Disk, Complete Assembly and **Installation of Windows**

Semester V

Course Title	Marks Distribution		Total
	Internal	External	
ENTREPRENEURSHIP DEVELOPMENT	20	80	100
Mobile Computing	20	80	100
Internet Routing Design	20	80	100
Project	20	80	100

Course Name : ENTREPRENEURSHIP DEVELOPMENT

Program : B.Voc	Internal max. marks: 80
Branch : Hardware & Networking	External max. marks:20
Semester: V	Total marks: 100
Paper-I	Time-3hours

Detailed contents
Unit 1- Concepts of entrepreneur: Entrepreneur- Definitions-Characteristics of entrepreneur-Classification of entrepreneur-Entrepreneurial traits- Entrepreneurial functions-role of entrepreneurs in the economic development-Factor effecting entrepreneurial growth-Entrepreneurship - Meaning- definition- Entrepreneur Vs Intrapreneur- Women Entrepreneurs-Recent development-Problems-Entrepreneurial Development Programmes- Objectives of EDP-Methods of training- Phases of EDP.
Unit 2- Institutional support and incentives to entrepreneurs- Functions of Department of Industries and Commerce (DIC) - Activities of Small Industrial Development Corporation (SIDCO)-Functions of National Small Industries Corporation(NSIC)-Functions of Small Industries Development Bank of India (SIDBI)-Khadi Village Industry Commission (KVIC)-Small Industries Service Institute (SISI)- Functions and services of Kerala Industrial Technical Consultancy Organisation (KITCO)-Activities of Science and Technology Entrepreneurship Development Project (STEDP)-Strategies of National entrepreneurship Development Board(NEDB)-Objectives of National Institute for entrepreneurship and small business development (NIESBUD)- Techno park-Functions of techno park Incentives- Importance-Classification of incentives-Subsidy- Types of Subsidy.
Unit 3: Micro Small and Medium Enterprises- Features- Objectives- Importance- Role of SME in the economic development- MSME Act 2006- Salient features- Credit Guarantee Fund Trust Scheme for MSMEs - Industrial estates-Classification-Benefits-Green channel- Bridge capital-Seed capital assistance-Margin money schemes –Single Window System- Sickness- Causes – Remedies- Registration of SSI
Unit 4: Setting up of Industrial unit-(Only Basic study) Environment for Entrepreneurship –Criteria for selecting particular project- Generating project ideas-Market and demand analysis-Feasibility study- Scope of technical feasibility- Financial feasibility- Social cost benefit analysis-Government regulations for project clearances -Import of capital goods- approval of foreign collaboration-Pollution control clearances- Setting up of micro small and medium enterprises-Location decision-Significance.

Suggested Readings:

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

1.Shukla M B., Entrepreneurship and Small Business Management, KitabMahal Allahabad.
2.Sangram Keshari Mohanty, Fundamentals of Entrepreneurship, PHI Learning Pvt. Ltd., New Delhi.
3.H. Nandan, Fundamentals of Entrepreneurship, PHI Learning Pvt. Ltd., New Delhi.
4. Dr. Vasant Desai, Small-Scale Industries and Entrepreneurship, Himalaya Publishing, Delhi.
5.C. N. Sontakki, Project Management, Kalyani Publishers, Ludhiana.
6. Peter F. Drucker, Innovation and Entrepreneurship, Routledge Taylor & Francis Group
7.Dr. Vasant Desai, Small Business Entrepreneurship, Himalaya Publications.

Course Name : Mobile Computing

Program : B.Voc	Internal max. marks: 80
Branch : Hardware & Networking	External max. marks:20
Semester: V	Total marks: 100
Paper-II	Time-3hours

Detailed contents
Unit 1-Mobile Communications: An Overview: Mobile Communication, Mobile Computing, Mobile Computing Architecture, Mobile Devices, Mobile System Networks, Data Dissemination, Mobility Management, Security Mobile Devices and Systems: Mobile Phones, Digital Music Players, Handheld Pocket Computers, Handheld Devices.
Unit 2-Operating Systems, Smart Systems, Limitations of Mobile Devices, Automotive Systems GSM and Similar Architectures: GSM-Services and System, Architecture, Radio Interfaces, Protocols, Localization, Calling Handover, Security, New Data Services, General Packet Radio Service, High-speed Circuit Switched Data, DECT.
Unit 3: Wireless Medium Access Control and CDMA based Communication: Medium Access Control, Introduction to CDMA-based Systems, Spread Spectrum in CDMA Systems, Coding Methods in CDMA, IS-95 cdma One System, IMT-2000, I-mode, OFDM, Mobile IP Network Layer.
Unit 4: IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Location Management, Registration, Tunnelling and Encapsulation Route Optimization, Dynamic Host Configuration Protocol, Mobile Transport Layer, Conventional TCP/IP Transport, Layer Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Methods of TCP-layer Transmission for Mobile Networks, TCP Over 2.5G/3G Mobile Networks

Suggested Readings:

1.Mobile Computing, Raj Kamal, Oxford University Press
2 Mobile Communications Jochen Schiller, Addison-Wesley.
3. Handbook of Wireless Networks and Mobile Computing, Stojmenovic and Cacute, Wiley,
4. Mobile Computing Principles: Designing and Developing Mobile

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Officer on Special Duty (Judicial)

5. Applications with UML and XML, Reza Behravanfar, Cambridge University Press

Course Name : Internet Routing Design

Program : B.Voc	Internal max. marks: 60
Branch : Hardware & Networking	External max. marks: 40
Semester: V	Total marks: 100
Paper-III	Time-3hours

Detailed contents
Unit 1 Networking and Network Routing: An Introduction, Addressing and Internet Service. An Overview, Network Routing, IP Address subnetting, Service Architecture, Protocol Stack Architecture, Router Architecture, static, dynamic routing.
Unit 2 Routing Algorithms and types, states. Implementation of RIP v1,2 and its configuration. Implementation of EIGRP and its configuration. Routing Protocols: Framework and Principles Routing Protocol, Routing Algorithm, and Routing Table, Routing Information Representation and Protocol Messages, Distance Vector Routing Protocol, Link State Routing Protocol, Path Vector Routing, Protocol, Link Cost
Unit 3: OSPF and Integrated IS-IS : OSPF: Protocol Features, OSPF Packet Format, Integrated IS-IS,
Unit 4: Manageable switch, swatching concept, states & modes of switches, looping in switch, Spanning tree protocol, V-LAN, implementation of VLAN

Suggested Readings:

1. Network Routing: Algorithms, Protocols, and Architectures Deepankar Medhi and Karthikeyan Ramasamy (Morgan Kaufmann Series in Networking)
2. Network Algorithmic: An Interdisciplinary Approach to Designing Fast Networked Devices George Varghese (Morgan Kaufmann Series in Networking)

Semester VI

Course Title	Marks Distribution		Total
	Internal	External	
Industrial Training/Project	0	300	300

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Officer on Special Duty (Judicial)

Bhupendra Narayan Mandal University

Laloo Nagar, Madhepura

ADMISSION AND EXAMINATION

B.Voc

in

Health Care

(MEDICAL IMAGING TECHNOLOGY)

Rajendra Mishra College

(A constituent unit of B. N. Mandal University)

Tiwari Tola, Saharsa-852201

Bihar

Vinod Kumar Tiwari
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REGULATION

Preamble

1. Bachelor in vocational programme in Health Care (Medical Imaging Technology) Generally known as B.Voc Health Care (Medical Imaging Technology) is a Professional programme to provide judicious mix of skills relating to a profession and appropriate content of General Education.
2. The B.Voc (Medical Imaging Technology) programme is under Skill Development Programme of N.S.Q.F (U.G.C) and that shall be under the Faculty of Science.

Course Objective

After the successful completion of this vocational course, the student would have acquired relevant appropriate and adequate technical knowledge together with the professional skills and competencies in the field of medical technologies so that he/she is properly equipped to take up gainful employment from this self finance course vocational course.

Duration of Course

1. The Integrated B.Voc programme shall be minimum three (03) academic years (having semesters of six month each)
2. The University examination shall be held after completing every semester on the dates as notified by the University.

INTERNSHIP

There shall be six months of compulsory internship after the final examination for candidates declared to have passed the examination in each of the subject. Internship should be done in a place that is recognized by the University/College. No candidate shall awarded degree certificate without successfully completing six months of compulsory internship.

Working days

1. There shall be at least 16-18 weeks of teaching work excluding On Job Training (OJT).
2. The institution will run the course for a minimum of thirty six period in a week (Five or Six Days), during which physical presence in the institution of all the teachers and students will be necessary.
3. The minimum attendance of each student shall have to be 80% for all course work and 90 % for field attachment.

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Curriculum

1. The Course will be consisted of combination of practice, theory and hands on skills in the Medical Imaging Technology sector. The curriculum for each years of the programme would be a suitable mix of general education and skill development components as per N.S.Q.F.
   - The focus of skill development components shall be to equip students with appropriate knowledge, practice and attitude. The skill development components will be relevant to the industry as per its requirements.
   - The overall design of the skill development component along with the job roles selected will be such that it leads to a comprehensive specialization in few domains.
   - The curriculum will focus on work readiness skills in each year of the training.
   - Adequate attention will be given in curriculum design to practical work, the job training, development of students' portfolios and project work.
2. Apart from the 6 weeks in the various inter semester breaks; 7 weeks shall be allocated to the field immersion. Each year should have a total of at least 200 working days, excluding the admission and examination period.
3. The Entry of the students could be either on level 5.

(Syllabus for B.Voc from Level – 5 to Level – 7)

5 Semester I	**Theory**			
	5.GV.01	Electronic Measurement and Instrumentation -I	3	50
	5.GV.02	Basic Anatomy (Cross Sectional Anatomy-II)	3	50
	5.GV.03	Tools, Equipment & Safety Measures -I	3	50
	5.GV.04	Soldering & De-Soldering of Components -I	3	50
	Lab/Practical			
	5.VP.01	Identification of Components, Tools, Equipment and its working -Lab	1.5	50
	5.VP.02	Basic diagnostics (Lab)	1.5	50
	On-Job-Training (OJT)/Qualification Packs			
	Radiology Technician (HSS/Q0201)	(Any one)	15	200
	Theory			
	5.GV.05	Electronic Measurement and Instrumentation -II	3	50
	5.GV.06	Basic Imaging	3	50

Vinod Kumar Tiwari
Officer on Special Duty (Academic)

5 Semester II	5.GV.07	Tools, Equipment & Safety Measures –II	3	50
	5.GV.08	Soldering & De-Soldering of Components & Emergency actions II	3	50
		Lab/Practical		
	5.VP.03	Soldering & De-Soldering of Components-Lab	1.5	50
	5.VP.04	Basic Imaging Practical Lab	1.5	50

Level	Code	Educational Component		Credit	Marks
		On-Job-Training (OJT)/Qualification Packs			
	To continue with the same QP as opted in Level 5 First semester		(Any one)	15	200
6 Semester I		**Theory**			
	6.GV.01	Fault analysis & Repairs		3	50
	6.GV.02	Cross Sectional Anatomy		3	50
	6.GV.03	Electronics Devices Circuit –I		3	50
	6.GV.04	Radiation and administrative issues		3	50
		Lab/Practical			
	6.VP.01	Electronics Devices Circuits Lab		1.5	50
	6.VP.02	Fault analysis & Repairs - Lab		1.5	50
		On-Job-Training (OJT)/Qualification Packs			
	Assistant Duty Manager - Patient Relation Services (HSS/Q6103)		(Any one)	15	200
6 Semester II		**Theory**			
	6.GV.05	CT and Ultrasound		6	100
	6.GV.06	Manufacturing & Quality Norms		3	50
	6.GV.07	Electronics Devices Circuit – II		3	50
		Lab/Practical			
	6.VP.03	Electronics Devices Circuit –II Lab		1.5	50
	6.VP.04	Manufacturing Practices		1.5	50
		On-Job-Training (OJT)/Qualification Packs			
	To continue with the same QP as opted in Level 6 First semester		Any one)	15	200
		Theory			
	7.GV.01	MRI, Image Processing and Recording		6	100
	7.GV.02	Advanced Imaging		6	100

Vinod Kumar Tiwari
Officer on Special Duty (Medical)

7 Semester I	Lab/Practical			
	7.VP.01	MRI, Image Processing and Recording	1.5	50
	7.VP.02	Advanced Imaging	1.5	50
	On-Job-Training (OJT)/Qualification Packs			

Level	Code	Educational Component		Credit	Marks
	Duty Manager - Patient Relation Services (HSS/Q6104)		(Any one)	15	200
7 Semester II	Theory				
	7.GV.03	Admin, Medico Legal and interventional Procedures		6	100
	7.GV.04	Project		6	100
	Lab/Practical				
	7.VP.03	Admin, Medico Legal and Interventional Procedures		3	100
	On-Job-Training (OJT)/Qualification Packs (The practical and theory need to be performed in a hospital/radiological centre)				
	To continue with the same QP as opted in Level 7 First semester			15	200

(Source: Adopted from the Module curriculum for B.Voc / D.Voc in Medical Imaging Technology by AICTE New Delhi)

Note:

Language 1 / Communicative English shall have to be compulsorily read by the candidates admitted at B.Voc. Students have to pass this examination and the marks of this paper will not be included in grading.

4.GE.01	Language – I	3	50

Internal Assessment

There shall be a Departmental Internal Assessment Committee which will meet periodically to carryout and monitor Internal Assessment Programme. There should be a minimum of at least one seasonal examination of 75 Marks in each semester. 25 Marks will be awarded to the students for their sincerity and punctuality.

OJT (On Job Training)

- The marks of OJT will be awarded as per the report and assessment.
- The marks of OJT and internal assessment will be sent to the University after completion of one semester.

4. **Registration**

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Any such student who is not registered with respective University shall have to get himself/herself registered with that University after paying the requisite fee as mentioned in the Regulation. The student, who is not registered under their respective / concerned Universities, shall not be allowed to continue their studies, nor to appear at the examination. The registration will be valid as per university guidelines of B.N. Mandal University, Laloonagar, Madhepura.

5. Examination

B.Voc (Medical Imaging Technology) programme would follow semester system with continuous and comprehensive assessment.

5.1 B.Voc (Medical Imaging Technology) programme would follow system with continuous and comprehensive assessment as an integral part.

5.2 To be permitted to appear in the semester-end university examination for the B.Voc (Medical Imaging Technology) a candidate must have:

I. Completed the course of study prescribed for the B.Voc (Medical Imaging Technology) programme

II. Registered with the respective University as a student.

III. Completed 80% attendance in theory classes and 90% in internship and practicum of the total classes held.

IV. Completed the Integrated B.Voc (Medical Imaging Technology) course in a maximum of six (06) years / and incase of directly admitted at degree level B.Voc in a maximum of four (04) years from the date of admission to the progrmmme.

5.3. a. The candidates shall have to study 150 credits for Integrated B.Voc / 90 credits for B.Voc (Admitted directly at Degree Level). A credit contains 15 classes and each class would be of one an hour.

b. All the B.Voc students are required to go for project and internship as prescribed in the curriculum. The weightage of internal assessment and engagement with the field shall be of 100 marks.

c. Project will be carrying of 100 marks.

5.4 The written examination in each of the theoretical papers of 100 marks shall be of three hours and the practical papers of 50 marks shall be one and half hours duration, similarly the practical papers of 100 marks shall be of four hours and practical papers of 50 marks shall be two durations.

5.5 For the evaluation of project there shall be a provision of one external examination to be conducted by the University after completion of Internship programme.

Vinod Kumar Tiwari
Officer on Special Duty (Academic)

5.6 Course of study for B.Voc examination shall be the same as incorporated in the Regulation, and as finally approved by the Hon'ble Chancellor.

5.7. A candidate who, after having completed the courses duration, in case he/she fails to appear at the examination they will be given a chance to complete the course after filling the application form without repeating the semester/course fee. However, this opportunity shall be given only in one more examination; within a period not exceeding four (04) years (B.Voc) from the date of admission.

5.8.. A candidate shall be allowed to appear in the final examination of B.Voc course only if he/she clears the each semester from 1st to 5th examination to be allowed to appear in the final (6th Semester) examination.

6. Conduct of examination and moderation of result

6.1 All the semester end examination shall be conducted by University which shall also finalize the programme for the examination fee only shall be charged.

6.2 In Order to pass B.Voc examination a candidate shall have to obtain at least 50% marks in each theory paper and 60% marks in each practicum paper/activity separately A candidate not securing the above qualifying marks, shall be declared as fail.

6.3 a. Final result of B.Voc course shall be published on the basis of candidates' Performance in all the papers spread over all ten (10) / six (06) Semesters.

b. The final result will be published only after the candidate has cleared all the papers securing minimum qualifying marks as approved in the Regulations.

7. Promotion

7.2.1. A student who fails in not more than Two Papers (Theory + Practical) in first semester Examination, he/she may be promoted to second semester to continue his/her studies. But such a student will have to clear the backlog papers in immediate succeeding examination of that semester.

7.2.2. Like wise, if a second semester student fails in not more than two papers, he/she may be promoted to 3rd Semester but all such students will have to clear their backlog papers of 1st and 2nd both semesters in the next succeeding examination of that semester.

7.2.3. No student shall be promoted to final Semester, unless he/she has cleared all the backlog papers.

Anand Kumar Tiwari
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7.2.4. The name of successful candidates shall be arranged in order of merit as follows :

PERCENTAGE OF MARKS	GRADE
86 & Above	O (Outstanding)
76 to 85	A+ (Excellent)
66 to 75	A (Very Good)
56 to 65	B (Good)
45 to 55	C (Average)
Less than 45	D (Fail)

Degree shall be awarded on computing the Grade point average system as follow :-
Computation of SGPA and CGPA : Following procedure to compute the semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) may be adopted :

- The SGPA is the ration of sum of the product of the number of credits with the grade point scored by a student in all the course components taken by a student and the sum of the number of credits of all the courses undergone by a student in a semester, i.e.,

$$SGPA\ (Si) = \sum(Ci \times Gi) / \sum Ci$$

Where 'Ci' is the number of credits of the i th course component and 'Gi' is the grade point scored by the student in the i th course component.

- The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme, i.e.

$$CGPA\ (Si) = \sum(Ci \times Gi) / \sum Ci$$

Where 'Si' is the SGPA of the ith semester and Ci is the total number of credits in that semester.

- The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

8.1. Result Improvement

8.2. A student can reappear in maximum of Two theory papers in the immediate succeeding examination of that semester to improve his/her result. Better of two scores shall be considered for preparation of the final result.

8.3. This facility shall be provided with 1st, 3rd and 5th Semester examination only.

8.4. Student can avail of this facility only once per semester, In no case second chance shall be provided/ permitted.

8.5. However, the name of such candidates with improved result, shall not be included in the Merit list.

9. Award of Degree

The Students/Candidate who complete the programme successfully, shall be awarded Degree of Integrated B.Voc / B.Voc by the respective University in prescribed format specifying the Class/Division/Grade in which he/she has been placed.

Vinod Kumar Tiwari
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ORDIDNANCE

FOR ADMISSION AND EXAMINATION

In

B.Voc Health Care

(MEDICAL IMAGING TECHNOLOGY)

A SELF FINANCED JOB ORRIENTED PROGRAMME APPROVED BY UNIVERSITY GRANT COMMISSION (Under N.S.Q.F) NEW DELHI

Vinod Kumar Tiwari
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B. Voc Healthcare (Medical Imaging Technology)

At A Glance

Duration : Minimum Three (03) Years after 10+2

Type : B.Voc Degree Programme

Eligibility : 10+2 or Equivalent from any Recognized Board (For B.Voc)

Admission Process : Entrance Test

Examination Scheme: Semester System

Course Fee : Semester wise

B. Voc Healthcare (Medical Imaging Technology) is an under graduate course that is designed with a diversified plan of study in advance imaging (MRI and CT), healthcare management and general knowledge about the discipline. Medical imaging technology is the technique and process used to create images of the human body or parts and function there of for clinical purposes or medical science. The duration of the course is five years for Integrated and three years for B.Voc and it may be in some cases more or less than this as per the direction of NSQF. This is a job oriented course established by UGC under N.S.Q.F.

Eligibility in Detail :

Minimum Qualification is 10+2 with science stream with English, Physics, Chemistry, Biology and Mathematics as optional subjects, and has scored not less than 50% of marks in Physics, Chemistry and Biology and Mathematics.

Benefits of this Course :

The Bachelor of Science in Medical Imaging program provides students with a diversified plan of study in Advanced imaging (CT, MRI and etc.), healthcare management, technical support knowledge (PACS and QM), and general studies in a balanced curriculum to prepared them for advancement in multiple career roles or continuation to Higher studies like masters and research.

Employment Area :

Commercial or Industrial , Advanced Imaging Modalities (CT or MRI), Healthcare Management or Administration, Graduate School (Radiologist Assistant or other graduate studies), Diagnostic Centres, Doctor's Offices, Educational & Research Institutes, Hospitals ,Radiology Clinics etc.

Job Types :

Medical Image Analysis Scientist, Research Assist in Imaging. , Marketing Executive, Medical Advisor, Radiographer, X-ray Technician

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Ordinance For Admission and Examination In Integrated B.Voc Course

1. Admission and Selection Procedure.

1.1 Admission process for 3 year B.Voc course in Health Care (Medical Imaging Technology) will usually start in the month of March, and shall be completely the end of June every year.

1.2 The selection of candidates for admission to the B.Voc programme in Regular mode will be made on the basis of merit obtained in B.Voc Entrance Test to be conducted centrally by the respective Universities / concerned College. Admission / Allotment of seats shall be done through counseling

1.3 The fee for appearing at the Entrance Test shall be Rs. 1000/- The Entrance Test fee may be revised by the competent authority as and when required.

1.4 To qualify for admission to B.Voc Course, a candidate must obtain minimum of 50% marks at the Entrance Test held for the purpose.

1.5 Admission shall be made strictly in order of merit that is percentage of marks secured by the candidate at the B.Voc Entrance Test held for the purpose.

1.6 Reservation of seats for the candidates of reserved categories shall be as per state govt. rules. The reserved category shall have to submit a copy of the certificate mentioning that the candidate belongs to particular reserved category from an officer not below the rank of S.D.M.

1.7 There of 3% seats will be reserved for person with disability (PWD) candidates i.e. visually Impaired (1%). These 3% seat are within the intake limit. Percentage of disability will be taken into consideration at the time of selection. The 3% seats PWD candidates will be filled up within the said limit fixed for that particular category to which the PWD candidates belong to.

1.8 Entrance test is mandatory.

1.9 List of admitted student will be published on website of university and college after declaration of merit list.

1.10 Allowed of seats, provide in the general ordinance for admission will be applicable only when candidate fulfils the minimum requirement of 50% marks in the Entrance Test.

1.11 After providing the opportunity for admission to the candidates in descending orders of merit of lower qualification as per marks obtained, if the reservation percentage of any reserved category is not unfilled / vacant in reserved categories, shall be filled up by admitting applicant from the merit list of general category.

1.12 If at any time it is found that a candidate has furnished any false information, his/her candidature shall he cancelled immediately and the deposited fee shall be forfeited and suitable legal action may be initiated.

Vinod Kumar Tiwari
Officer on Special Duty (Medical)

1.13 In case of any controversy of irregularly pertaining Integrated B.Voc course the respective University shall take the final decision as per the approved Ordinance and Regulations.

1.14 No applicant shall be admitted, who in the opinion of the concerned Vice-Chancellor / Principal, does not deserve to be admitted in the best interest of the University (specifying the ground of rejection.)

1.15 Fee Details: Candidates admitted in B.Voc will have to pay rupees 20,000.00 in each semesters.

➢ **Fee Details :-**

Tuition Fee	:-	**10,000**
Development Fee	:-	**6,000**
Library Fee	:-	**100**
Laboratory Charge	:-	**3,000**
Misc Expense	:-	**900**

2. **Eligibility :**

Candidates seeking admission to the B.Voc programme should have obtained at least 50% marks or an equivalent grade in the following programmes.

(i) 10+2 Exam from Bihar Senior Secondary Board, Patna.
or C.B.S.E / I.C.S.E or equivalent.

(ii) Examination passed with Physics, Chemistry, Biology
or Math with 50 percent marks.

3. **Intake :**

There shall be basic unit of 50 students. Additional unit in the programme shall be permitted only based on quality of infrastructure faculty & other facilities. This intake capacity may be modified as per the norms and guidelines by UGC time to time.

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Detailed Curriculum

Level 3 (Semester – I)

(D.Voc from Level – 3 to Level – 4)

Sub Code - (3.GE.01) Language - I

Module 1: Reading comprehension (prescribed texts) and functional grammar

A variety of genres – short stories, expository pieces, biographies, poems, plays, newspaper and magazine excerpts have been included. Teaching of grammar has been integrated with the reading texts. The emphasis is on functional grammar.

The following ten prose texts and five poems have been selected for development of different reading skills.

Prose texts (Prescribed)

1. A warmer or a colder earth (popular science) Arthur – C. Clark
2. The tiger in the tunnel (narrative) – Ruskin Bond.
3. First two or four pages from Sunny Days (autobiographical) – By Sunil Gavaskar
4. Case of suspension (narrative)
5. Big brother (narrative) Shekhar Joshi
6. Father, dear father (news paper article form the Hindu)
7. Face to face (autobiographical) Ved Mehta
8. I must know the truth (narrative) Sigrun Srivastva
9. If I were you (play) Douglas James
10. India, her past and her future (speech) Jawahar Lal Nehru

Poems

1. Leisure – W H Davis
2. The road not taken – Robert Frost
3. Where the mind is without fear- Tagore
4. My grandmother's house – Kamla Das
5. The night of the scorpion – Nissi, Ezekiel

Non prescribed

In this section learners will be exposed to newspaper, articles, tables, diagrams, advertisements etc. which they have to read carefully and interpret. In the examination similar pieces will be used.

Grammar and usage :

The following points of grammar and usage have been selected from the reading passages.

1. agreement/concord: number – gender etc.
2. Tenses: simple past (negatives/interrogatives) present perfect, past perfect continuous, past perfect, expressing future time (will and going to)

Vinod Kumar Tiwari
Officer on Special Duty (Vocational)

3. Passive voice (perfect tenses and modals)
4. Modals (must, should ought to, would)
5. Linking words (to like because although, instead of, if, as, since, who, which that, when however, in spite of)
6. Reported speech, statements, questions (yes/no)

Module 2: Functional writing and study skills

This module helps the learner to write descriptive and narrative paragraph, letters, reports notices etc. and also practice skills of note making

1. Paragraph writing
   - Describing objects
   - Describing people
   - Narrating events, stories
2. Letter writing
   - Application for leave
   - Application for jobs
   - Asking for information from various agencies (e.g. Last date for getting prospects; price of items before placing doers etc.)
3. Note making
   - Ending (punctuation, spelling, appropriate vocabulary, structures)

Vinod Kumar Tiwari
Officer on Special Duty (OSD)

Level 3 (Semester – I)

Sub Code - (3.GE.02) Applied Chemistry

1. **Structure of Atom:**
   Rutherford model of the structure of atom, Bohr's theory of electrons, quantum numbers and their significance, de-Broglie equation and uncertainty principle, electronic configuration of 1 to 30 elements.
2. **Periodic Properties of Elements:**
   Periodic law, periodic table, periodicity in properties like atomic radii and volume, ionic radii, ionization energy and electron affinity. Division of elements into s, p, d and f blocks.
3. **Chemical Bonds:**
   Electrovalent, covalent and coordinate bond and their properties. Metallic bonding (electron cloud mode) and properties (like texture, conductance, luster, ductility and malleability).
4. **Fuel and their Classification:**
   Definition, characteristics, classification into solid, liquid and gaseous fuel. Petroleum and brief idea of refining into various factions and their characteristics and uses. Calorific value of fuel. Gaseous fuels- preparation, properties, composition and use of producer gas, water and oil gas.
5. **Water:**
   Impurities in water, methods of their removal, hardness of water, its types, causes and removal, disadvantages of hard water in boilers, pH value and its determination by calorimetric method.
6. **Corrosion:**
   Its meaning, theory of corrosion, prevention of corrosion by various methods using metallic and non-metallic coatings.
7. **Plastic and Polymers:**
   Plastic-thermo-plastic and thermo-setting. Introduction of Polythene, P.V.C. Nylon, synthetic rubber and phenol-formal-dehyde resin, their application in industry.

Vinod Kumar Tiwari
Officer on Special Duty (Academic)

Sub Code - (3.GE.03) Applied Physics

1. **Units & Dimensions:** M.K.S. fundamentals & derived units, S.I. base units supplementary units and derived units, Dimensions of various physical quantities, uses of dimensional analysis.
2. **Surface Tension and Viscosity:** molecular forces, molecular theory of surface tension, surface energy, capillary action, concept of viscosity, coefficient of viscosity, principle and construction of viscometers.
3. **Vibrations:** Vibration as simple spring mass system, elementary and qualitative concept of free and forced vibrations, resonance. Effects of vibrations on building bridges and machines members.
4. **Heat:** Temperature and its measurement, thermoelectric, platinum resistance thermometers and pyrometers. Conduction through compound media and laws of radiations.
5. **Ultrasonics:** Productions of ultrasonic waves by magnetostriction and piezo-electric effect, application of ultrasonics in industry.
6. **Optics:** Nature of light, reflection and refraction of a wave from a plane surface. Overhead projector and Epidiascope.

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Sub Code - (3.GE.04) Applied Biology - I

1. **Cell-The Unit of Life** Cell theory and cell as the basic unit of life: Structure of prokaryotic and eukaryotic cells; Plant cell and animal cell; cell envelope; cell membrane, cell wall; cell organelles - structure and function; endomembrane system, endoplasmic reticulum, golgi bodies, lysosomes, vacuoles; mitochondria, ribosomes, plastids, microbodies; cytoskeleton, cilia, flagella, centrioles (ultrastructure and function); nucleus.
2. **Biomolecules** Chemical constituents of living cells: Structure and function of proteins, carbohydrates, lipids, nucleic acids; Enzymes- types, properties, enzyme action.
3. **Cell Cycle & Cell Division:** Cell Cycle, Mitosis, Meiosis and their function
4. **Cellular Respiration** - glycolysis, fermentation (anaerobic), TCA cycle and electron transport system (aerobic); energy relations - number of ATP molecules generated; amphibolic pathways; respiratory quotient.
5. **Anatomy & Physiology of Human Body:** Definition, Anatomical terms, Tissues, Glands and membranes, Homeostasis
6. **Blood & its Components:** Different Blood Components and their functions, Coagulation of Blood, Blood Grouping
7. **Human Skeleton:** Identification, Classification and functions of bones, joints and muscles, Physiology of muscle contraction

   Sensory Organs: Eye, Ear, Nose, Tongue and Skin – Structure

Sub Code - (3.GP.01) Applied Chemistry – Lab

1. Proximate analysis of solid fuel.
2. Experiments based on Bomb Calorimeter.
3. Determination of turbidity in a given sample.
4. To determine the flash and fire point of a given lubricating oil.
5. To determine the viscosity of a given lubricating oil by Redwood viscometer.
6. To determine cloud and pour point of a given oil.

Sub Code - (3.GP.02) Applied Physics – Lab

1. To determine the surface tension of a liquid by rise in capillary.
2. To determine the viscosity of a given liquid.
3. To determine the frequency of tuning fork using a sonometer.
4. To determine the frequency of AC main using sonometer.

   Time period of a cantilever.

- Attitude and behavior- professional behavior, treating people equally
- Code of conduct, professional accountability and responsibility, misconduct
- Differences between professions and importance of team efforts
- Cultural issues in the healthcare environment

5. Principals of Management

- Introduction to management
- Strategic Management
- Foundations of Planning
- Planning Tools and Techniques
- Decision Making, conflict and stress management
- Managing Change and Innovation
- Understanding Groups and Teams
- Leadership
- Time Management
- Cost and efficiency

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Sub Code - (3.GV.02) Basic Electricity

1. **Current Electricity:** Definition of Resistance, Voltage, Current, Power, Energy and their units, Relation between electrical, mechanical and thermal units, Temperature variation of resistance, Difference between AC and DC voltage and current.

2. **D.C. Circuits:** Ohm's Law, Series – parallel resistance circuits, calculation of equivalent resistance, Kirchhoff's Laws and their applications.

3. **Electric Cells:** Primary cell, wet cell, dry cell, battery, Li-ion battery, series and parallel connections of cells, Secondary cells, Lead Acid Cell, Discharging and recharging of cells, preparation of electrolyte, care and maintenance of secondary cells.

4. **Lighting Effects of Current:** Lighting effect of electric current, filaments used in lamps, and Tubelight, LED, their working and applications.

5. **Capacitors:** Capacitor and its capacity, Concept of charging and Discharging of capacitors, Types of Capacitors and their use in circuits, Series and parallel connection of capacitors, Energy stored in a capacitor.

6. **Electromagnetic Effects:** Permanent magnets and Electromagnets, their construction and use, Polarities of an electromagnet and rules for finding them.

   Faraday's Laws of Electromagnetic Induction, dynamically induced e.m.f., its magnitude and induction, inductance and its unit. Mutually induced e.m.f., its magnitude and direction, Energy stored in an inductance.

   Force acting on a current carrying conductor in magnetic field, its magnitude and direction, Principles and construction of dynamo.

7. **A.C Circuits**

   Generation of A.C. voltage, its generation and wave shape. Cycle, frequency, peak value R.M.S. value, form factor, crest factor, Phase difference, power and power factor, A.C. Series Circuits with (i) resistance and inductance (ii) resistance and capacitance and (iii) resistance inductance and capacitance, Q factor of R.L.C. series circuits.

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Sub Code - (3.GV.03) Basic Electronics

1. **Overview of Atom, Sub-Atomic Particles and CRO**
   - Brief History of Electronics.
   - Atom and its elements,
   - Electron, Force, Field intensity, Potential, Energy, current
   - Electric field, Magnetic field, Motion of charged particles in electric and magnetic field.
   - Overview of CRO, Electronic and Magnetic deflection in CRO, Applications.

2. **Voltage and Current**
   - Resistance, Ohm's law, V-I Characteristics, Resistors, Capacitors, Inductors.
   - Voltage and Current sources, Symbols and Graphical representation
   - Overview of AC, DC, Cells and Batteries, Energy and Power.

3. **Basics of Semiconductor**
   - Semiconductor materials, Metals and Semiconductors and Photo-electric emission.
   - N-type and P-type semiconductor, Effects of temperature on Conductivity of semiconductor.
   - PN junction diode, depletion layer, Forward & Reverse bias, V-I Characteristic, Effects of temperature, Zener diode, Photo diode, LED, Types and applications of diode.
   - Diode as a rectifier, Half wave and full wave rectification, Zener diode Regulator.
   - Introduction to Filters, Clippers, Clampers

4. **Bipolar Junction Transistor**
   - Operation of NPN and PNP transistors, Biasing of BJT.
   - CB, CE and CC configuration
   - Introduction to FET, JFET, MOSFET, CMOS and VMOS

5. **Transistor Amplifier and Applications**
   - Introduction, Single and Multi-stage amplifiers
   - Introduction to Oscillators
   - Introduction to Thyristors, PNPN diode, SCR, LASCR, DIAC, TRIAC

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Sub Code - (3.GV.04) Applied Biology –II

1. **Nervous System:** Introduction to nervous system, Classification of nerve fibres, Physiology of nerve transmission, Neurotransmitters, Human Brain, Spinal Cord, Refluxes, Epilepsy, Electroencephalogram, Autonomic Nervous System, Peripheral Nervous System

2. **Renal Physiology:** Kidney, Nephron, Urine Formation, Renal Function Test, Dialysis

3. **Reproductive System:** Male reproductive system, Female reproductive system, Menstrual Cycle, Fertility Control

4. **Endocrinology:** Hormones, Homeostasis, Pituitary Gland, Thyroid Gland, Parathyroid Gland, Endocrine function of pancreas, Adrenal hormones, Local Hormones

5. **Digestive System:** Introduction, structure and function of digestive organs Pharynx, esophagus, Stomach, Intestines, Liver & Pancreas.

6. **Respiratory System:** Physiological Anatomy of respiratory tract, physiology of respiration, different pulmonary volumes, Artificial respiration

7. **Cardiovascular System:** Structure and physiology of Human Heart, cardiac muscles and cardiac cycle

8. **Genetics:** Mendelian inheritance; deviations from Mendelism – incomplete dominance, codominance, multiple alleles and inheritance of blood groups, pleiotropy; elementary idea of polygenic inheritance; chromosome theory of inheritance; chromosomes and genes; Sex determination - in humans, birds and honey bee; linkage and crossing over; sex linked inheritance - haemophilia, colour blindness; Mendelian disorders in humans - thalassemia; chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes.
9. **Genetic Materials:** Structure of DNA and RNA; DNA packaging; DNA replication; Central dogma; transcription.
10. Genetic code, translation; gene expression and regulation - lac operon; genome and human and rice genome projects; DNA fingerprinting

Manoj Kumar Tiwari
Officer on Special Duty (Mizoram)

Sub Code - (3.VP.01) Basic Electricity Lab

1. Verify that resistance of conductor is directly proportional to resistivity and length and inversely proportional to cross- sectional area of the conductor.
2. Verification of Ohm's Law.
3. Verification of temperature co-efficient of resistance:
   (i) Positive for Tungsten and Nichrome and
   (ii) Negative for carbon.
4. Study of series resistive circuits.
5. Study of parallel resistive circuits.
6. Study of series and parallel connection of cells in circuits.
7. Preparation of Electrolyte for lead acid battery and its charging and measurement of Specific gravity with the help of hydrometer.
8. To find heat efficiency of an electric kettle.
9. Charging and Discharging of a capacitor.
10. Verification of magnetic field of a Solenoid with:
    (i) Iron core and
    (ii) Air core.
11. Verification of Faraday's Laws of electromagnetic induction.
12. Verification of Torque development in a current carrying coil in magnetic field.
13. Study of R.L. series circuit and measurement of power and power factor.
14. Study of R.C. series circuit and measurement of power and power factor.
15. Study of R.L.C. series circuit and measurement of power and power factor.
16. Study of R.L.C. series circuit for calculation of inductive reactance, capacitive reactance, impedance and Q- Factor.

Instruments Required

- Trainer kit for verifying ohm's law,
- Trainer kit for measuring TCR
- Lead acid battery,
- Hydrometer,
- Electric kettle,
- Trainer kit for measuring power and power factor in RLC circuits

Vimal Kumar Tiwari

Sub Code - (3.VP.02) Basic Electronics – Lab

1. Study of current and voltage measurement using Ammeter and Voltmeter.
2. Study of current and voltage measurement using Galvanometer.
3. Study of current, voltage and resistance measurement using of Multi-meter
4. Study of Power and Energy measurement using Wattmeter and Energy meter.
5. Study of working principle of Signal Generator and measurement of amplitude, time period and frequency of signal using Oscilloscope.
6. Study of V-I Characteristic of Diode.
7. Study of V-I Characteristic of Zener Diode. And use of Zener Diode as voltage regulator.
8. Study of Half wave rectifier with and without filter circuit.
9. Study of Full wave rectifier with and without filter circuit.
10. Study CE configuration for NPN and PNP transistors and measurement of voltage and current gain.
11. Study CB configuration for NPN and PNP transistors and measurement of voltage and current gain.
12. Study CC configuration for NPN and PNP transistors and measurement of voltage and current gain.
13. Study of working of single layer PCB manufacturing
14. Study of working of double layer PCB manufacturing.
15. Design of 7 segment display using LED and bread board.

Instruments Required

- Ammeter
- Voltmeter,
- Multimeter,
- Galvanometer,
- Energy Meter,
- CRO,
- Diode Trainer kit
- Zener diode Trainer kit
- Rectifier trainer kit
- Transistor charactrics trainer kit,
- PCB manufacturing Lab
- Bread board trainer kit to design 7-segment display.

Vinod Kumar Tiwari
Officer on Special Duty (Technical)

Level 4 (Semester I)

Sub Code - (4.GV.01) Engineering Science

1. **Soldering and Brazing**

   General characteristics of soldering, brazing joints, processes and their characteristics, brief description of soldering and brazing tools equipment, types of solders and fluxes and their uses, soldering defects and their remedies, brazing materials, advantages and disadvantages of soldering and brazing. Introduction to PCB, PCB designing, wet etching, dry etching, track correction, wiring, single sided and double sided PCB.

2. **Measuring Instruments**

   Construction and working principles of moving iron and moving coil voltmeters and ammeters, dynamometer type wattmeter, ohm meter, megger and induction type energy meter- their circuit connection and application for measurement of electrical quantities.

3. **Electrical Engineering Drawing**

   Schematic and wiring diagram for domestic simple wiring, symbols used for different electrical devices and equipments.

4. **Electrical wiring**

   Types of wiring – cleat wiring, casing and capping, C.T.S./T.R.S. wiring, metal sheath wiring, conduit wiring and concealed wiring – their procedure. Factors of selection of a particular wiring system, importance of switch, fuse

5. **Earthing**

   Earthing of wiring system, types of faults, their causes and remedies. Types of earthing- plate earthing and Pipe earthing, their procedure and application. Methods of finding numbers of circuits and circuit distribution by distribution board system, loop in system of wiring connections IE rules related to wiring.

Vinod Kumar Tiwari
Officer on Special Duty (Technical)

Sub Code - (4.GV.02) Trouble Shooting & Maintenance of Electronic Equipment's-I

1. Basic Occupational Safety and Precautions

2. Microphones and Loudspeakers

- Construction, working principle and frequency response of Carbon Microphone, Variable Reactance Microphone, Capacitance Microphone, Piezo-Electric Microphone, Moving Coil Microphone.
- Frequency ranges of musical instruments, Intensity and Dynamic Range, Constructions and working principles of Moving Coil Loudspeaker, Impedance and Power Level of loudspeaker, Frequency characteristics of Practical Loudspeakers: Woofer, Tweeter, Squawker

3. Recorder

- Block diagram of disk recording and reproduction.
- Principle of optical recording, CD/ DVD manufacturing and recording, CD/ DVD player system, Advantages/ Disadvantages.
- Steps for Fault finding & Analysis.

Sub Code - (4.GV.03) IT Tools-I

I. Computer Organization & OS: User perspective.
- Understanding of Hardware.
- Basics of Operating System.

II. Networking and Internet.
- Network Safety concerns.
- Network Security tools and services.
- Cyber Security.
- Safe practices on Social networking.

III. Office automation tools:
- Spreadsheet.
- Word processing.
- Presentation.

Vinod Kumar Tiwari
Officer on Special Duty (Online)

Sub Code - (4.GE.01) Language

Module – 3: Listening and speaking skills

In this module the learners will be exposed to a variety of listening activities recorded on audiotapes. These will be samples of good spoken English, which the learners can use as models. Work sheets will accompany the listening material.

This module will include the following:

1. Introducing yourself/friends in formal and informal situations.
2. Inviting people (over the phone and face to face) giving details of occasion, time place and date. Acceptance and refusal of invitation – formal and informal.
3. Seeking and supplying information (example opening an account in a bank, applying for loans etc.)
4. Talking and conveying messages (over the phone and face to face).
5. Giving directions / instruction.
6. Discussing contemporary issues related to environment, child labour, gender bias etc.
7. Listening to excepts form television and radio.
8. Listening to poems/plays (prescribed).
9. Listening to speeches / talks.
10. Listening to songs like "We shall overcome".

Module – 4 to 6: (English for specific purposes) (opt any one)

There modules are being offered. A learner has to opt for any one. The first is for academic purposes and the next two are for vocational purposes. The focus is not on the teaching of the subject matter like science and literature but on the way in which language is used in the deferent subjects.

Module 4: English for Science

This course will introduce learners to some interesting pieces of popular science

1. Health and hygiene
2. Conservation of (nearly extinct) animals.
3. Plant life.
4. Bio gas / solar energy.

These pieces illustrate the use of English in scientific writing: giving information factually, logically and objectively.

Vinod Kumar Tiwari
Officer on Special Duty (Academic)

Module 4: English for Receptionist

This module will introduce the learners to a variety of exercises, tasks and meaningful activities related to the receptionist's use of English. The printed course materials will be supported by tapes.

The following competencies be developed:

1. Receiving messages, making request etc.
2. Supplying information .
3. Giving advice and making suggestions
4. Dealing with complaints
5. Making entries in an appointment book, register etc.

Module 4: English for Office Use

This course will help the learner to use English effectively and appropriately in the office environment. The competencies will be developed.

1. Using the telephone taking and passing messages.
2. Receiving messages
3. Marking noting on files and circular.
4. Writing office notes, memos, notices, agendas for meetings.
5. Telegrams and fax messages.
6. Writing business letters, application enquires, complaints.
7. Filling in forms, cheques, pay in slips etc.

Vinod Kumar Tiwari
Officer on Special Duty (Acad)

Sub Code - (4.VP.01) Engineering Science – Lab

1. Introduction to tools and measuring instruments, their safe keeping, safety
2. precautions
3. Measurement of resistance by ammeter and voltmeter method and Ohm meter.
4. Dismantling and reassembly of dynamo.
5. Calibration of ammeter, voltmeter and wattmeter with the help of standard meters.
6. Calibration of single phase energy meter with the help of standard wattmeter and stop watch.
7. Controlling lamps in series, parallel and series parallel.
8. Controlling lamps for two or three places.
9. Drawing schematic diagram to give supply to consumers.
10. Practice on casing and capping wiring.
11. Practice on cleat wiring.
12. Practice on CTS/TRS wiring.
13. Practice on metal sheet weather proof rigid PVC wiring.
14. Practice on conduit wiring.
15. Practice on concealed wiring.
16. Measurement of insulation resistance of wiring installation by megger.
17. Polarity test of wiring installation.
18. Testing of wiring installation.
19. Installation of pipe earthing for wiring installation.
20. Installation of plate earthing for wiring installation.

Instruments Required

- Ammeter
- Voltmeter
- Ohm meter
- Dynamo
- Wattmeter,
- Stop watch controlling lamp
- Different types of wire for practice on wiring,
- Conduit pipes
- Megger
- Materials for earthing

Vikash Kumar Tiwari
Officer on Special Duty (Technical)

Sub Code - (4.VP.02) Trouble Shooting & Maintenance of Electronic Equipment's Lab

1. Assembly study and fault finding of an audio amplifier.
2. Assembly, study and fault finding of a graphic equaliser.
3. Study working, assembly & fault finding of Colour TV.
4. Study working, assembly & fault finding of LCD TV.
5. To trace the fault in the following panel controls and correct them:
   - Volume control.
   - Brightness control.
   - Contrast control.
   - Vertical hold control.
6. To trace the following stages of T.V. set: Tuner, MF stage, Video detector, Video amplifier.
   - Sound I.T. Sound output stage.
   - Syne separator.
   - Vertical oscillator.
   - Horizontal oscillator.
   - Line Driver Stage.
   - Line output transformer.
   - Power supply.
7. To find fault for the following defects:
   - No picture no sound.
   - Sound present, picture missing.
   - Picture rolls vertically.
   - Picture tears (Horizontal oscillator).
   - Faults in tuner/IF/power supply.
8. Study working, assembly & fault finding of tape recorder system.
9. Study working, assembly & fault finding of CD/DVD player system.
10. Study working, assembly & fault finding of Printer.
11. Study working, assembly & fault finding of Scanner.
12. Study working, assembly & fault finding of Microwave oven.
13. Study working, assembly & fault finding of Telephone.
14. Study working, assembly & fault finding of Fax Machine.
15. Study working, assembly & fault finding of UPS system.
16. Study working, assembly & fault finding of DTH kit.

Equipment's Required

1. Demo kit to understand the working of different section of color TV and to create the fault and rectifying the faults.
2. Trainer kit/ demo module to understand the working and fault finding of tape recorder system
3. Trainer kit/ demo module to understand the working and fault finding of CD/ DVD system
4. Trainer kit/ demo module to understand the working and fault finding of Printer system

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

5. Trainer kit/ demo module to understand the working and fault finding of Scanner system
6. Trainer kit/ demo module to understand the working and fault finding of Microwave oven system
7. Trainer kit/ demo module to understand the working and fault finding of Telephone system
8. Trainer kit/ demo module to understand the working and fault finding of Fax Machine system
9. Trainer kit/ demo module to understand the working and fault finding of UPS system
10. Trainer kit/ demo module to understand the working and fault finding of DTH kit

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Level 4 (Semester II)

Sub Code - (4.GV.04) Physics and Technology in Imaging

1. **Physical Quantity, its unit and measurement:** Fundamental and derived quantity, SI unit, various physical/radiation quantity used in Diagnostic Radiology and its unit (for example, KVp, mA, mAS, Heat unit (HU)
2. **Radiation quantities and units:** Radiation intensity-exposure, roentgen, its limitations-kerma and absorbed dose-electronic equilibrium-rad, gray, conversion factor for roentgen to rad-quality factor-dose equivalent-rem, Sievert. Quality factor, dose equivalent, relationship between absorbed dose and equivalent dose.
3. **Radiation detection and measurements:** Principle of radiation detection-Basic principles of ionization chambers, proportional counters, G.M counters and scintillation detectors. Measuring system: free ionization chamber-thimble ion chamber-condenser chamber-secondary standard dosimeter-film dosimeter-chemical dosimeter-Thermo Luminescent Dosimeter-Pocket dosimeter.
4. **Radiation intensity** and exposure, photon flux and energy flux density.
5. **Photochemistry:** Principles: Acidity, alkalinity, pH, the processing cycle, development, developer solution. Fixing, fixer solution, washing, drying replenishment, checking and adjusting-latent image formation-nature of development-constitution of developer-development time factors in the use of developer. Fixers constitution of fixing solution-factors affecting the fixer-replenishment of fixer-silver conservation-Drying-developer and fixer for automatic film processor-rinsing-washing and drying. Replenishment rates in manual and automatic processing-Silver recovery-Auto and manual chemicals.
6. **X-rays:** Discovery of x-rays-X-ray production and properties: Bremsstrahlung radiations-Characteristics X-Rays, factors affecting X-ray emission spectra, X-ray quality and quantity, HVL measurements, heel effect, soft and hard X-Rays, added and inherent filtration, reflection and transmission targets.
7. **Fluoroscopy:** Fluorescence and phosphorescence - description, fluorescent materials used in fluoroscopic screens, construction of fluoroscopic screen and related accessories, tilting table, dark adaptation. Basic principles of cine fluoroscopy and angiography use of grid controlled x-ray tube.

Sub Code - (4.GV.05) Digital Electronics

1. **Number Systems and Boolean Algebra**
   - Basics of Analog and Digital.
   - Boolean algebra, De-morgan's law, Truth tables.

2. **Logical Circuits**
   - Logic gates: AND, OR, NOT, NOR, NAND, XOR, XNOR.
   - Combinational Circuits: -
   - Arithmetic Circuits: Half adders, Full adders, sub tractors,
   - Data Processing Circuits: Encoders, Decoders, Multiplexers, De-Multiplexers
3. **Latches and Flip-Flops**
   - Concept of Latches, Types of Latches, SR latch.

Vinod Kumar Tiwari
Officer on Special Duty (Jud...)

- SR Flip Flop, JK Flip Flop, D Flip flop, T Flip Flop, Flip Flop.
- Introduction to counters, Types of counters Asynchronous and Synchronous.
- Introduction to shift registers, types of shift registers,

4. **Introduction to Display Devices**
   - LED, LCD, 7 segment display
5. **Integrated Circuits and Memories**
   - Introduction to IC's, Importance and applications, Linear and Digital IC's.
   - Introduction to SSI, MSI, LSI and VLSI (Terminology & Definitions).
   - Memory Organisation and Operations, RAM, ROM.

SbCode-(4.GV.06) Trouble Shooting & Maintenance of Electronics Equipment's-II

1. **TV System**
   - Working principle with block diagram of TV transmitter and receiver. Brief description with circuit diagram: TV Tuner, Video IF stage, Sound stage, Picture tube & its associated circuit, synchronizing circuits, Horizontal & vertical deflection circuits, Remote control of a TV receiver, Idea of bandwidth, blanking and synchronization pulses, modulation scheme, colour transmission.
   - Cable type TV system, Head end processor, Trunk & cable distribution system with block diagram, Scrambling.
   - Introduction to LCD and LED TV systems, Introduction to high definition systems. Steps for Fault finding & Analysis.
2. **Modern Appliances**

   Working principle and block diagram of following: Microwave oven, Telephone, Fax machine, Printers, Scanners, Steps for Fault finding & Analysis. Working principle and block diagram of following: Microwave oven, Telephone, Fax machine, Printers, Scanners. Steps for Fault finding & Analysis. Working principle and block diagram of following: Microwave oven, Telephone, Fax machine, Printers, Scanners. Steps for Fault finding & Analysis.

Vikash Kumar Tiwari
Officer on Special Duty (Technical)

Sub Code - (4.GV.07) IT Tools-II

I. **Multi Media Design: (Open Source Design Tools).**
- Interface and Drawing Tools in GIMP.
- Applying Filters.
- Creating and handling multiple layers.
- Using Stamping and Smudging tools.
- Importing pictures.

II. **Troubleshooting: Hardware, Software and Networking.**
- Commonly encountered problems.
- (Monitor: No display, KB/Mouse not responding, monitor giving beeps, printer not responding, check for virus, delete temporary files if system is slow, adjust mouse speed).

III. **Work Integrated Learning IT – ISM**
- Identification of Work Areas.
- Work Experience.

Sub Code - (4.VP.03) IT Tools – Lab

- Spreadsheets, Word, Presentation
- Multimedia Design
- Troubleshooting
- Project / Practical File
- Viva Voce

Vinod Kumar Tiwari
Officer on Special Duty (Jt. Cal)

Sub Code - (4.VP.04) Digital Electronics – Lab

1. Verification of truth tables for AND, OR, NOT and NAND logic gates.
2. Verification of truth tables for NOR, XOR and XNOR logic gates.
3. Construction and verification of operations of half adder and full adder circuits using basic gates.
4. Construction and verification of operations of half adder and full adder circuits using XOR gates.
5. Construction and verification of operations of full adder and full adder circuits using NAND gates.
6. Construction and verification of operations of half & full Subtractor circuit using basic gates.
7. Construction and verification of operations of half & full Subtractor circuit using XOR gates.
8. Construction and verification of operations of half & full Subtractor circuit using NAND gates.
9. Study and verification of truth tables for 3 line to 8-line decoder.
10. Study and verification of truth tables for 8 line to 3 line and 10 line to 4-line encoder.
11. Study and verification of truth tables for 4:1 MUX using gates
12. Study and verification of truth tables for 1:4 DEMUX using gates.
13. Study and verification of truth tables for 8:1 MUX using IC 74151.
14. Study and verification of truth tables for 1:8 DEMUX using IC 74138.
15. To study and verify the truth table of excess-3 to BCD code converter.
16. To study and verify the truth table of binary to gray code converter.
17. Construction and verification of truth tables for S-R, D and J-K flip flops.
18. Study working of various display devices. (LED, Common anode, Common cathode 7 segment display)
19. Study and verification of truth table for universal shift register.
20. Study the operation of a synchronous counter.

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Level 5 (Semester I)

(B.Voc from Level – 5 to Level – 7)

Sub Code - (5.GV.01) Electronic Measurements and Instrumentation-II

Unit, dimensions and standards: Scientific notations and metric prefixes. SI electrical units, SI temperature scales, Other unit systems, dimension and standards.

Measurement Errors: Gross error, systematic error, absolute error and relative error, accuracy, precision, resolution and significant figures, Measurement error combination, basics of statistical analysis.

PMMC instrument, galvanometer, DC ammeter, DC voltmeter, series ohm meter

Transistor voltmeter circuits, AC electronic voltmeter, current measurement with electronic instruments, probes Digital voltmeter systems, digital multimeters, digital frequency meter system.

Sub Code - (5.GV.02) Basic Anatomy (Cross Sectional Anatomy-II)

1. Introduction to Sectional Anatomy & Terminology- Sectional planes, Anatomical relationships/terminology
2. Anatomy of the upper thorax and mid thorax- Surface anatomy relationships, Bony structures and muscles, Blood vessels, Lungs, heart and great vessels, Esophagus
3. Anatomy of the Abdomen- Major organs and their accessories, Abdominal blood vessels
4. Anatomy of the Pelvis- Bony structures and associated muscles, Digestive and urinary systems
5. Neuro Anatomy- Scan planes
6. Brain - Cerebral hemispheres, Sinuses, Ventricles, Brainstem and associated parts, Arterial/venous systems, Basal ganglia, Cranial nerves
7. Spine- Vertebra and disc, Spinal cord and meninges
8. Neck- Arterial/venous systems, Muscles, Glands and pharynx.

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Sub Code - (5.GV.03) Tools, Equipment and Safety Measures-I

1. **Cables & Connectors**
   - Non-Metallic Sheathed Cable
   - Un grounded & Grounded Power Supply Cable
   - Metallic Sheathed Cable
   - Multi-Conductor Cable
   - Coaxial Cable
   - Unshielded Twisted Pair Cable
   - Shielded twisted pair cable
   - Ribbon Cable
   - Armoured & Unarmoured Cable
   - Twin-Lead Cable
   - Twin axial Cable
   - Optical fiber cable
   - Connectors
2. **ESD Clothing**
   - What to wear, how to wear

Vinod Kumar Tiwari
Officer on Special Duty (Technical)

Sub Code - (5.GV.04) Soldering & De-Soldering of Components-I

1. Soldering & De Soldering of Basic Components
   - Soldering Tools
   - Different types of Soldering Guns related to Temperature and wattages, types of tips
   - Solder materials and their grading
   - Soldering and De Soldering Stations and their Specifications
   - Preparing Component for Soldering
   - PCB Applications
   - Types of PCB
   - Soldering Basic Components on PCB
   - De soldering Basic Components
   - Safety precautions while Soldering & De soldering
   - Check for cold continuity of PCB
   - Identification of loose/dry solder, broken tracks on printed wire assemblies & discrete components mounted circuit boards
   - Join the broken PCB track and test
   - De soldering using Pump and wick
   - Introduction of SMD Components

Sub Code - (5.VP.01) Identification of Components, Tools, Equipment's & working – Lab

1. Identification & working of various electronic components
2. Working of testing equipment
3. Measurement using Multimeter & Clamp meter
4. Battery health check-up
5. Measure and test the voltage of given cells.

Sub Code - (5.VP.02) Basic Diagnostics (Lab)

1. X-Ray Imaging
   - X-Ray Tubes.
   - Stationary & Rotation Anode.
   - X-ray Consolestation (Demo of KV, MA and exposure time settings).
   - Procedures to reduce Scattered Radiation.
   - Focus Principle.
   - Grids.
   - Screen.
   - Image intensifiers.
   - Use of contrast materials.

Vinod Kumar Tiwari
Officer on Special Duty (Technical)

2. **Dark Room Technique**

- Images to ring devices.
- Film cassette construction.
- Duplicating a films
- Spectrum.
- Films types - Specialized use.
- Operation, storage.
- Photo chemistry.
- Development.
- Fixing.
- Radiation protection, counters.
- Assessment.

3. **Radiological Positioning**

- Patient transfer technique.
- Turning the patient.
- Restraint techniques - Trauma, Pediatric, Geriatric, physically handicapped, disturbed patients, an aesthetized patient, moving chair & stretcher patients.
- Tubes & catheters, Nasogastric, chest, Urinary, intravenous, oxygen & other (Castsurgical & cardiac) Alcoholic, bed pans & urinals.
- Assessment.

Vinod Kumar Tiwari
On Special Duty (Judicial)

Level 5 (Semester II)

Sub Code - (5.GV.05) Electronic Measurements and Instrumentation – II

Voltmeter and ammeter methods, Wheatstone bridge, low resistance measurements, low resistance measuring instruments AC bridge theory, capacitance bridges, Inductance bridges, Q meter

CRO: CRT, wave form display, time base, dual trace oscilloscope, measurement of voltage, frequency and phase by CRO, Oscilloscope probes, Oscilloscope specifications and performance. Delay time based Oscilloscopes, Sampling Oscilloscope, DSO, DSO applications

Instrument calibration: Comparison method, digital multimeters as standard instrument, calibration Instrument Recorders: X-Y recorders, plotters

Sub Code - (5.GV.06) Basic Imaging

1. **The photographic Process: Introduction,** visible light, images produced by radiation, light sensitive photographic materials.
2. **Image Characteristic:** Real and mental images, reflected, transmitted and emitted light images Photographic emulsions. The photographic latent image. Positive process
3. **Film materials in X-ray:** History, structure of an x- ray film, single and double emulsion films, types of films, cross over effect.
4. **Spectral sensitivity** of film material, graininess of film material, speed and contrast of photographic materials.
5. **Sensitometry:** Photographic density, characteristic curves, features of the characteristic curve.
6. **Intensifying screens and cassettes.** Cassette design, care of cassettes, types of cassettes, and mounting of intensifying screens, loading and unloading of cassettes, Care of intensifying screens, tests to check screen film contact and light leakage.
7. **The fluorescent materials,** types of intensifying screens, intensification factor. The influence of KV, scattered radiation. Detail, sharpness and speed, size of the crystals, reciprocity failure, and quantum mottle.
8. **Film processing:** Development. The nature of development-manual or automatic. The PH scale, constitution of developing solutions both in manual and automatic processing and properties of developing chemicals, development time, factors in the use of a developer, developer activity.
9. **Dark Room:** Layout and planning. Dark room construction - Nature of floor, walls, ceiling and radiation protection, Dark room equipment and its layout. Location of pass through boxes or cassette hatches.
10. **Radiographic Image:** Components in image quality-density, contrast and detail.
11. **Photo Fluorography:** Cine cameras, cine fluorography, cine film, serial cameras, processing of cine films, flurographic films.

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Level 5 (Semester II)

Sub Code - (5.GV.05) Electronic Measurements and Instrumentation – II

Voltmeter and ammeter methods, Wheatstone bridge, low resistance measurements, low resistance measuring instruments AC bridge theory, capacitance bridges, Inductance bridges, Q meter

CRO: CRT, wave form display, time base, dual trace oscilloscope, measurement of voltage, frequency and phase by CRO, Oscilloscope probes, Oscilloscope specifications and performance. Delay time based Oscilloscopes, Sampling Oscilloscope, DSO, DSO applications

Instrument calibration: Comparison method, digital multimeters as standard instrument, calibration instrument Recorders: X-Y recorders, plotters

Sub Code - (5.GV.06) Basic Imaging

1. **The photographic Process:** Introduction, visible light, images produced by radiation, light sensitive photographic materials.
2. **Image Characteristic:** Real and mental images, reflected, transmitted and emitted light images Photographic emulsions. The photographic latent image. Positive process
3. **Film materials in X-ray:** History, structure of an x- ray film, single and double emulsion films, types of films, cross over effect.
4. **Spectral sensitivity of film material, graininess of film material, speed and contrast of photographic materials.**
5. **Sensitometry:** Photographic density, characteristic curves, features of the characteristic curve.
6. **Intensifying screens and cassettes.** Cassette design, care of cassettes, types of cassettes, and mounting of intensifying screens, loading and unloading of cassettes, Care of intensifying screens, tests to check screen film contact and light leakage.
7. **The fluorescent materials,** types of intensifying screens, intensification factor. The influence of KV, scattered radiation. Detail, sharpness and speed, size of the crystals, reciprocity failure, and quantum mottle.
8. **Film processing:** Development. The nature of development-manual or automatic. The PH scale, constitution of developing solutions both in manual and automatic processing and properties of developing chemicals, development time, factors in the use of a developer, developer activity.
9. **Dark Room:** Layout and planning. Dark room construction - Nature of floor, walls, ceiling and radiation protection, Dark room equipment and its layout. Location of pass through boxes or cassette hatches.
10. **Radiographic Image:** Components in image quality-density, contrast and detail.
11. **Photo Fluorography:** Cine cameras, cine fluorography, cine film, serial cameras, processing of cine films, flurographic films.

Vinod Kumar Tiwari
Officer on Special Duty (Medical)

Sub Code - (5.GV.07) Tools, Equipment & Safety Measures-II

1. Tools & Equipment
   - Types of tools & equipment required and deployed in manufacturing, installing & servicing
   - Identification and termination process
   - General maintenance of tools/equipment and recalibration of Test equipment
   - General safety and common-sense safety
2. PPE
   - Usage & benefits of PPE
   - Types & usage of various PPE
   - Maintenance of PPE
3. Clean Room Environment
   - Do's and Don't
   - Shop Floor Discipline

(5.GV.08) Soldering & De-soldering components & Emergency actions

1. **Introduction to SMD Components**
   - Identification of 2, 3, 4 terminal SMD components
   - Soldering the SMD components on the PCB
   - Make the necessary settings on SMD soldering station to solder various ICs of different packages by choosing proper clamping tools
   - Identify various connections and the setup required for SMD soldering station
   - De solder the SMD components from the given PCB
   - Make the necessary settings on SMD soldering station to de solder various ICs of different packages by choosing proper clamping tools
   - Make a panel board using different types of switches for a given application
   - Identification of crimping tools for various IC packages
   - Reliable Soldering Practices

2. **Emergency actions**
   - Minimum Requirements
   - Reporting Emergencies
   - Emergency exits
   - Primary and secondary evacuation routes
   - Locations of fire extinguishers
   - Fire alarm pull stations' location
   - Assembly points
   - Medical Services

Vinod Kumar Tiwari
Officer on Special Duty (Jt. Secy.)

Sub Code - (5.VP.03) Soldering & De-soldering components – Lab

1. Assemble the product
2. Dis-assemble the product
3. Safety Precautions & emergency plans

Sub Code - (5.VP.04) Basic Imaging Practical's Lab

1. Test to check the x-ray films and screen contact in the cassette
2. Test to check light leakage in the cassette.
3. To check the effect of safe light on exposed as well as unexposed x-ray film

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

Level 6 (Semester I)

Sub Code - (6.GV.01) Fault Analysis & Repairs

1. Classification of fault
2. Identification of fault
3. Rectification of fault
4. Repairing/Replacing Module
5. Analysis for the different types of equipment's
   - Smartphones
   - Air Conditioning
   - Security systems
   - Electronically controlled doors
6. Fault analysis based on hardware and software component
7. Diagnostic and Testing Methods
8. Visual Inspection
9. Earth Continuity Test
10. Insulation Resistance Test

Sub Code - (6.GV.02) Cross Sectional Anatomy-II

1. Introduction to Sectional Anatomy & Terminology- Sectional planes, Anatomical relationships/terminology
2. Anatomy of the upper thorax- Surface anatomy relationships, Bony structures and muscles, Blood vessels.
3. Divisions of the mid-thorax, heart and great vessels- Lungs, heart and great vessels, Esophagus
4. CT/MRI Images of the Thorax - Normal and pathologic
5. Anatomy of the Abdomen- Major organs and their accessories, Abdominal blood vessels
6. CT/MR Images of Abdomen - Normal and pathologic
7. Anatomy of the Pelvis- Bony structures and associated muscles, Digestive and urinary systems
8. Reproductive Organs
9. CT/MR Images of the Male/Female Pelvis- Normal and pathologic
10. Neuro Anatomy- Scan planes
11. Brain - Cerebral hemispheres, Sinuses, Ventricles, Brainstem and associated parts, Arterial/venous systems, Basal ganglia, Cranial nerves
12. Spine- Vertebra and disc, Spinal cord and meninges
13. Neck- Arterial/venous systems, Muscles, Glands and pharynx

Vinod Kumar Tiwari
Officer on Special Duty (Academic)

Sub Code - (6.GV.03) Electronics Devices Circuit-I

Unit I

Energy Bands and Charge Carrier in Semiconductor: Bonding forces and energy bands in solids, Charge Carriers in Semiconductors, Carrier Concentrations, Drift Mechanism. Excess carriers in Semiconductors: Optical Absorption, Carrier Lifetime: Direct Recombination, Steady State Carrier Generation, Quasi-Fermi Level, Diffusion of carriers and Einstein relation.

UNIT II Junctions: Equilibrium Conditions, Forward and Reveres Biased Junctions; Steady State Conditions. Optoelectronic Devices: Photodiode V-I characteristic, Photodetector, Solar Cells, Light Emitting Diode.

Sub Code - (6.GV.04) Radiation & Administrative Issues

1. **Quality Assurance:** General principles and preventive maintenance for routine, daily, weekly, monthly, quarterly, annually – machine calibration. Basic concepts of quality assurance, Radiation proof test; Resolution test; Phantom measurements - CT, US and MRI, Sensitometry, State and local regulations governing radiation protection practice.
2. **Maintenance and care of equipment:** Safe operation of equipment, Routine cleaning of equipment and instruments, Cassette, screen maintenance, Maintenance of automatic processor and manual processing units, Routine maintenance of equipment.
3. **Radiation protection:** Somatic and genetic radiation effects, Basis for occupational exposure limits, Ionizing radiation from natural and man-made source and their approximate dose equivalent contribution. Legal and ethical radiation protection responsibilities of radiation workers.
4. **Units detection and measurement:** Units of radiation for exposure, absorbed dose, dose equivalent, and radio- activity, Quality factor to determine the dose equivalent.
5. **Radiation detection devices:** Ion-Chambers, Proportional counter, Thermo-luminescent dosimeters (TLD). Appropriate application and limitation of each radiation detection device.
6. **Personal monitoring and occupational exposures:** Monitoring devices, Body badges and ring badges. Thermo-luminescent dosimeters. Pocket ionization chambers. Applications, advantages and limitations of each device, Values for dose equivalent limits for occupational radiation exposures. Structures critical for potential life effect

Vinod Kumar Tiwari
Officer on Special Duty (Academic)

for whole body irradiation. Age proportion formula for the determination of a maximum accumulated dose equivalent.

7. **Patient Protection:**

   Relationship of beam limiting devices with radiation protection of patients, Added and inherent filtration, Purpose and importance of patient shielding, Patient shielding devices and radiographic , procedures shielding to the radiographic procedures, Protection of women at child- bearing age, Methods to avoid repeat radiographs, Importance of clear, concise, instruction (effective communication skills) as a method of radiation protection, Effects of immobilization techniques to eliminate voluntary motions

8. **AERB specifications:** Radiation safety (lead glass equivalence, lead lined doors) - room size - type approval – registrations & licenses - selection of exposure parameter for various protocols – diagnostic reference levels.

Sub Code - (6.VP.01) Electronic Devices and Circuits Lab

1. Study of Lab Equipments and Components: CRO, Multimeter, and Function Generator, Power supply- Active, Passive Components and Bread Board.
2. P-N junction diode: Characteristics of PN junction diode - Static and dynamic resistance measurement from graph.
3. Applications of PN junction diode: Half & Full wave rectifier- Measurement of Vrms, Vdc, and ripple factor.
4. Characteristics of Zener diode: V-I characteristics of zener diode, Graphical measurement of forward and reverse resistance.
5. Application of Zener diode: Zener diode as voltage regulator. Measurement of percentage regulation by varying load resistor.

Sub Code - (6.VP.02) Fault Analysis & Repairs – Lab

1. Categorization of faults
   - Hardware/Software, User Induced, Component Failures
   - L0 to L4 repairs
2. Testing electrical/electronic components in the product
3. Troubleshoot and repair of the faults identified in the product
4. Preventive Maintenance Services

Vinod Kumar Tiwari
Director (Special Duty)

Level 6 (Semester II)

Sub Code - (6.GV.05) CT and Ultrasound

1. Computed Tomography (CT)

- **Basic Computed Tomography:** Basic principles of CT, generations of CT, CT instrumentation, image formation in CT, CT image reconstruction, Hounsfield unit, CT image quality, CT image display
- **X-ray tube:** Construction working and limitations, generations, methods of cooling the anode, anode rating chart, speed of anode rotation, angle of anode inclination, Focus, anode heel effect, Effect of variation of anode voltage and filament temperature, inherent filter and added filter, bow tie filter, effect on quality of the spectrum.
- **Collimator designs:** Pencil beam, Fan beam, Cone beam CT, Z-axis collimation, detector design – construction and working - Gas filled detectors – solid state detectors – flat panel detectors.
- **Principles of tomography:** advantages and limitations - generations – spiral CT – slip ring technology - Multislice CT – dual source CT - pitch – rotation time.
- **Basic principles of Image Reconstruction:** Back projection, analytical an iterative methods – MPR – MIP – volume rendering – surface shaded display (SSD) – bone reconstruction.
- **CT artefacts:** motion artefacts, streak artefacts, ring artefacts, partial volume artefacts etc. causes and remedy.
- **Dose and Dosimetry:** CT Dose Index (CTDI, etc.), Multiple Scan Average Dose (MSAD), Dose Length Product (DLP), Dose Profile, Effective Dose, Phantom Measurement Methods, Dose for Different Application Protocols, Technique Optimization
- **Advanced Computed Tomography:** Helical CT scan: Slip ring technology, advantages, multi detector array helical CT, cone – beam geometry, reconstruction of helical CT images, CT artifact, CT angiography, CT fluoroscopy, HRCT, post processing techniques: MPR, MIP, Min IP, 3D rendering: SSD and VR, CT Dose, patient preparation, Imaging techniques and protocols for various parts of body, CT contrast enhanced protocols – CT angiography – (Aortogram, selective angiogram head, neck and peripheral) image documentation and Filing, maintenance of equipment and accessories.
- **Technical Assessment and Equipment Purchase Recommendations**

2. Ultrasonography

- **Basic Acoustics, Ultrasound terminologies:** acoustic pressure, power, intensity, impedance, speed, frequency, dB notation: relative acoustic pressure and relative acoustic intensity.
- **Interaction of US with matter:** reflection, transmission, scattering, refraction and absorption, attenuation and attenuation coefficients, US machine controls, US focusing.
- **Production of ultrasound:** Piezoelectricity, Medical ultrasound transducer: Principle, construction and working, characteristics of US beam.
- **Ultrasound display modes:** A, B, M

Vinod Kumar Tiwari
Officer on Special Duty (Judicial)

- **Real-time ultrasound:** Line density and frame rate, Real-time ultrasound transducers: mechanical and electronic arrays, ultrasound artifacts, ultrasound recording devices, and Distance, area & volume measurements.
- **Techniques for imaging different anatomic areas, ultrasound artifacts, biological effects and safety.**
- **Doppler Ultrasound:** Doppler Theory, Doppler-Frequency Shift, Reflector Velocity Dependence, Doppler Angle Dependence, Spectral Analysis, Continuous Wave (CW) Doppler, Pulsed Doppler, Pulse Transmission and Range Gating, Aliasing, Duplex Scanning, Color Flow Imaging, Power Doppler, Patient preparation for Doppler, Doppler artifacts, vascular sonography.

Sub Code - (6.GV.06) Manufacturing & Quality Norms

1. Manufacturing & Quality Norms- keep it differently according to all applications
   - Manpower Deployment and Operations as per Work Instructions and criticality of the process Understanding how to form each operation and practical training of operation
   - Understanding accept and reject criterion of a particular operation. Practical training of testing/checking each operation
   - Quality Norms of accept and practical training of electronic equipment's/Devices Acceptance/Rejection training of various defects
2. Manufacturing & Quality Norms – II
   - Process in packing line-packing line Operations sequence flow and its importance
   - Quality Systems - Accept, Reject criterion of various tests at OQA
   - Training of Assembly of electronic components - Assemble, Check, test electronic components
   - Various Labels and their Importance - Understanding Labels, Scanning and its importance
   - Packing of components/devices - Various Stages of packing
   - Acceptance, Reject and sampling following QA norms - AQL level, Sampling techniques, as per QA sampling accept, reject numbers

Sub Code - (6.GV.07) Electronics Devices Circuit-II

1. Good Manufacturing Concepts & Practices - II
   - Brief Introduction
   - Total Quality Management
   - ISO Standards
2. Kaizen
3. Toyota Production System
4. Lean Manufacturing
   - Combination of Inventory
   - Supply Chain
5. Quality and Inspection
   - 3 Sigma and 6 Sigma Orientation

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Sub Code - (6.VP.03) Electronic Devices and Circuits –II Lab

1. Characteristic of BJT: BJT in CE configuration- Graphical measurement of parameters from input and output characteristics. Measurement of Av, AI, Ro and Ri of CE amplifier with potential divider biasing.
2. Measurement of Operational Amplifier Parameters: Common Mode Gain, Differential Mode Gain, CMRR, Slew Rate.
3. Applications of Op-amp: Op-amp as summing amplifier, Difference amplifier, Integrator and differentiator.
4. Field Effect Transistors: Single stage Common source FET amplifier –plot of gain in dB Vs frequency, Measurement of, bandwidth, input impedance, maximum signal handling capacity (MSHC) of an amplifier.
5. Oscillators: Sinusoidal oscillators. Wein's bridge oscillator b. phase shift oscillator.

Sub Code - (6.VP.04) Manufacturing Practices

1. Work study concepts
2. Team work concepts

Vinod Kumar Tiwari
Officer on Special Duty (Acad)

Level 7 (Semester I)

Sub Code - (7.GV.01) MRI, Image Processing and Recording

1. Basic concepts of Magnetic resonance imaging (MRI): Atomic structure, Hydrogen as imaging medium, magnetism, precession, resonance, Electromagnetic radiation, NMR - basic concepts of MRI, Faraday's cage.

2. Basic MR Image formation: RF Excitation, Relaxation (T1 and T2), Computation and display, Free induction decay, RF wave form designs.

3. Introduction to MR coils: Volume coils, Gradient coils, Slice selection, phase encoding, frequency encoding

4. Artifacts: Cause of artifacts, Image quality, image contrast, signal to noise ratio, resolution, artefacts, MR contrast agents, Advanced MR techniques, flow effects, MR angiography echo planner imaging, magnetization transfer, fat suppression, MR spectroscopy, functional imaging, Magnetic resonance hazards and safety, Recent development.

5. MRI Scanners: Methods of MRI imaging methods; Head and Neck ,Thorax, Abdomen, Musculoskeletal System imaging; Clinical indications and contraindications; types of common sequences effects of sequence on imaging; Protocols for various studies, slice section, patient preparation; positioning of the patient; patient care-calibration - paramagnetic agents and dose, additional techniques and recent advances in MRI; image acquisition-modification of procedures in an unconscious or un co-operative patient; plain studies; contrast studies; special procedures; reconstructions; 3D images; MRS blood flow imaging, diffusion/perfusion scans; strength and limitations of MRI; role of radiographer.

6. MR safety: instrumentation and biological effects

Vinod Kumar Tiwari

Sub Code - (7.GV.02) Advanced Imaging

1. Computed Tomography its principle, various generations and advancements.
2. Ultrasonography, Color Doppler- its principle, advancements and applications.
3. Digital Radiography and Digital subtraction angiography equipment- principle, advancements and applications.
4. Fusion Imaging including PET-CT, PET- MRI.
5. Digital Mammography, DEXA equipment- principle, advancements and applications.
6. Tele radiology HIS, RIS and PACS
7. Image processing in digital radiography systems: Post processing techniques in console using CR, DR and flat panel fluoroscopy systems
8. Basic angiography and DSA

Sub Code - (7.VP.01) MRI, Image Processing and Recording

1. MRI Images of the Thorax - Normal and pathologic
2. MR Images of Abdomen - Normal and pathologic
3. MR Images of the Male/Female Pelvis- Normal and pathologic
4. Neuro Anatomy- Scan planes brain - Cerebral hemispheres, Sinuses, Ventricles, Brainstem and associated parts, Arterial/venous systems, Basal ganglia, Cranial nerves
5. Spine- Vertebra and disc, Spinal cord and meninges

Vinod Kumar Tiwari
Officer on Special Duty (Medical)

Sub Code -(7.VP.02) Advanced Imaging

1. Central Nervous System: Myelography, Cerebral studies, Ventriculography
2. Arthrography: Shoulder, Hip, Knee, Elbow
3. Angiography: Carotid Angiography (4 Vessel angiography), Thoracic and Arch Aortography, Selective studies: Renal, SMA, Coeliac axis, Vertebral angiography, Femoral arteriography, Angiocardiography
4. Venography: Peripheral venography, Cerebral venography, Inferior and superior venocavography, Relevant visceral phlebography
5. Cardiac catheterization procedures: PTCA, BMV, CAG, Pacemaker, Electrophysiology
6. Gynaecology: Hysterosalpingography
7. Biliary system: Plain film radiography, Intravenous cholangiography, percutaneous cholangiography, Endoscopic retrograde cholangio-pancreatography. (ERCP), Operative cholangiography, Post-Operative cholangiography (T-tube Cholangiography)
8. Gastrointestinal tract: Barium meal, Barium swallow, Small bowel enema, Barium enema.
9. Renal tract: Intravenous urography, retrograde pyelography, micturating cystourethrography.
10. Other: Sialography

Level 7 (Semester II)

Sub Code - (7.GV.03) Admin, Medico Legal and Interventional Procedures

1. Principals of Management: Introduction to management, Strategic Management, Foundations of Planning, Planning Tools and Techniques, Decision Making, conflict and stress management, Managing Change and Innovation, Understanding Groups and Teams, Leadership, Time Management, Cost and efficiency.

2. Medical law and ethics: Medical ethics; Definition, Goal, Scope; Introduction to Code of conduct; Basic principles of medical ethics – Confidentiality; Malpractice and negligence; Autonomy and informed consent - Right of patients; Care of the terminally ill-Euthanasia ; Organ transplantation; Medico legal aspects of medical records – Medico legal case and type- Records and document related to MLC - ownership of medical records - Confidentiality Privilege communication - Release of medical information - Unauthorized disclosure - retention of medical records - other various aspects: Professional Indemnity insurance policy; Development of standardized protocol to avoid near miss or sentinel events; Obtaining an informed consent.

3. Quality and patient safety: Quality assurance; Concepts of Quality of Care, Quality Improvement Approaches, Standards and Norms, Quality Improvement Tools, Introduction to NABH guidelines; AERB specifications, radiation safety (lead glass equivalence, lead lined doors), room size, type approval, registrations & licenses, selection of exposure parameter for various protocols, diagnostic reference levels.

4. Basics of emergency care and life support skills: Basic life support (BLS), sudden Cardiac Arrest (SCA), cardiopulmonary resuscitation (CPR), Automated External Defibrillator (AED).

Vinod Kumar
Officer on Special Duty (Academic)

(7.GV.04) Project

Project work may include case study related to Newer Imaging Technology.

(7.VP.03) Admin, Medico Legal and Interventional Procedures

1. Quality assurance and Radiation safety survey in diagnostic X-ray installations.
2. Community orientation and clinical visit: Visit will include visit to the entire chain of healthcare delivery system - sub centre, PHC, CHC, SDH, DH and Medical College, private hospitals, dispensaries and clinics.
3. Governance at village level including interaction and group discussion with village panchayat and front line health workers.
4. Clinical visit to their respective professional department within the hospital.

Acknowledgement
Adopted from the Module curriculum for B.Voc / D.Voc in Medical Imaging Technology by AICTE Ne Delhi

ज्ञान-विज्ञान विमुक्तये

UNIVERSITY GRANTS COMMISSION
BAHADURSHAH ZAFAR MARG
NEW DELHI – 110 002

Speed Post

F.No. 5-1/2018 (NSQF)

July, 2018

Sub: Approval of Programmes/ courses under NSQF

Dear Sir/Madam,

This is with reference to your proposal for introducing vocational courses under NSQF. I am directed to convey approval of the UGC for the following programmes/courses to be run by your institution under NSQF from the academic session 2018-19:

Programme
B.Voc
1. Health Care (Medical Imging Technology)

It is further informed that the institution may admit 50 students per course, and appoint faculty and staff as per the provisions of the NSQF Guidelines.

You are requested to kindly ensure compliance of the terms and conditions/provisions as laid down in the Guidelines for providing Skill-based Education under National Skill Qualification Framework. You are also requested to convey your confirmation to start the course/s from the academic session 2018-19 along with the course-wise actual intake of students to UGC at the earliest.

With regards,

Yours faithfully,

(Meganka Sekhar Sarma)
Education Officer

Registrar/Principal/Nodal Officer
Rajendra Mishra College,
Bypass Road, Tiwari Tola, Saharsa-852201,
Bihar.

Vinod Kumar Tiwari
Officer on Special Duty (...)

B. N. MANDAL UNIVERSITY

Laloo Nagar, Madhepura-852113 (Bihar)

Ref.....

Date.....

NO OBJECTION CERTIFICATE

This is to certify that R.M. College, Saharsa is a constituent unit under B.N. Mandal University, Madhepura and also included under section 2 (f) and 12 (B) of University Grant Commission Act-1956.This is a NAAC accredited grade-B college. This University has no objection if the college gets permission to start Bachelor of Vocational (B.Voc.) course by U.G.C.

By order of the Vice-Chancellor,

17/7/18

Co-ordinator
College Development Council

Memo No. C.C.D.C.(B.Voc)-42/18)- 939/18 Dated:- 17.07.2018

Copy forwarded to: For information & necessary action.

01. The Principal, R.M. College, Saharsa
02. Inspectors of College (Arts & Commerce), B.N.M.U. Madhepura.
03. Inspectors of College-(Science), B.N.M.U. Madhepura.
04. Secretary-cum-P.A to Vice-Chancellor/Assistant to Pro. V.C./P.A to Registrar, B.N.M.U. Madhepura.

17/7/18

Co-ordinator
College Development Council

Vinod Kumar Tiwari
Officer on Special Duty (Law)