

MOHANLAL SUKHADIA UNIVERSITY: UDAIPUR

SYLLABUS OF PAPER-I: ICT & RESEARCH METHODOLOGIES

FACULTY: SCIENCE

(-Note: There will be a theory and a practical examination on paper-I. In theory examination, question paper will contain total 8 questions. Four from Section –A and four from Section B. Students will be required to answer total five questions selecting at least two questions from section-B. Time: 3hrs. Max. Marks: 100.

Practical Examination will be conducted to test proficiency of the candidates in the topics covered under Section-B. Practical will be of 6hrs duration. Max.Marks: 100.)

SECTION-A

RESEARCH METHODOLOGIES

40 hrs

Note: Total four questions will be set from this section

Elements of Learning	
Process of Thinking or Conceptualization of research	What is research a. Objectives of Research b. What makes to do Research c. Importance Types of Research a. Basic b. Applied Stages of Research a. Selection of a Research topic and Problem b. Assessment of current status of topic chosen c. Definition of a research problem d. Literature survey and Reference collection e. Formulation of Hypothesis f. Research design and Actual Investigation g. Data Analysis, Interpretation of Results h. Report writing
Experimental Planning	Designing of Experiments Purpose of Research Design, Characteristics of Good Research Design

	<ul style="list-style-type: none"> a. Approaches to be used in solving problem b. Setting up of experiments c. Animals, Use of Animals, Animal ethics and Related laws, IAEC, Setting up experimental Groups (Only for Zoology, Pharmacy) d. Bio safety regulations in Biological Research (For life sciences only) e. Time frame f. Factorial design g. Variables, control and Standards h. Psychological bias
Data Analysis	<p>Data Collection and Tabulation Frequency distribution Diagrammatic and Graphical representation of Statistical data, Sampling techniques, measures of sampling tendencies, Basic Statistics Standard Deviation and Standard error, Correlation and Regression, Basic idea of testing significance, level of significance. Students T test, chi-square test, F test and Analysis of variance, Basic knowledge of computer Statistical Programs-Prism, Sigma plot,SPSS Errors in Experiments, Propagation of Errors</p>
Subject Specific Research Methodologies	<p>Subject specific Research Methodology courses will be offered by the department. Total 10 to 15 classes will be held. One question may be set from the topics taught in the class.</p>

SECTION-B

ICT IN RESEARCH

40 Hrs

Note: Total four questions will be set from this section

Computer & Internet: Desktop computers, Block diagram of a computer, Input and output devices, memory and storage devices, Client server, Desktop, Workstation, Parallel and Super computing. Different ports of PC's and its uses, Different type of printers. Scanners. Software: OS, Windows OS, Application software. Networking, different LAN and WAN connections, connecting to a network, testing connection, Internet, IP address, Hypertext, Uniform Resource Locator, Web Browsers, Domain Name, Internet Services Providers, Internet Security, Internet Requirements, Web Search Engine, Net Surfing, Internet, Services.

Windows XP/VISTA: Windows concepts, Features, Windows Structure, Desktop, Taskbar, Start Menu, My Computer, Recycle Bin, Windows Accessories- Calculator, Notepad, Paint, Wordpad, Character Map, Windows Explorer, Entertainment, Managing Hardware & Software- Installation of Hardware & Software, Using Scanner, System Tools, Communication, Sharing Information between programs.

Word Processing; MS Word: Features, Creating, Saving and Opening Documents in Word, Interface, Toolbars, Ruler, Menus, Keyboard Shortcut, Editing, Previewing, Printing, & Formatting a Document, Advanced Features of MS Word, Find & Replace, Using Thesaurus, Using Auto- Multiple Functions, Mail Merge, Handling Graphics, Tables & Charts, Covertng a word document into various formats like- Text, Rich Text format, Word perfect, HTML, PDF etc.

Worksheet- MS-Excel: Worksheet basics, creating worksheet, entering into worksheet, heading information, data, text, dates, alphanumeric values, saving & quitting worksheet, Opening and moving around in an existing worksheet, Toolbars and Menus, Keyboard shortcuts, Working with single and multiple workbook, working with formulae & cell referencing, Auto sum, Coping formulae, Absolute & relative addressing, Worksheet with ranges, formatting of worksheet, Previewing & Printing worksheet, Graphs and charts, Database, Creating and Using macros, Multiple worksheets- concepts, creating and using. Presentation: MS Power Point: Creating slide show with animations. Autocentnt Wizard, creating a blank presentation, autolayout, Power point screen: screen layout and Views, insert a new slide, applying design template, changing slide layout, reordering and hiding slides, slide show and editing custom slide. Resizing a text box , Text box properties, Delete a text box, Bulleted lists, Numbered lists, Adding notes, Video and Audio, Adding text Editing options, Formatting text, Replace fonts, Line spacing , Change case Spelling check, Color schemes , Adding clip art, Adding an image from a file Editing graphic, AutoShapes, WordArt, Backgrounds, Action buttons Slide animation Animation preview Slide transitions Slide show options Slide master Header and footer Slide numbers Date and time

Data Analysis and Display: Facilities in MS Excel for Data analysis and, display, Other data display softwares, case study: Origin . Software for, Scientific and Statistical Analysis: Case studies : SPSS Database: Creating a Database and simple Querying,

Graphics and Drawing: Adobe Photoshop: Basics (only Introductory, level), Image compression (GIF, JPEG, PNG formats), Multimedia, Digital Arts, Audio and Video formats, Multimedia Projections.

Internet and Intranet: HTML, Web pages, Creating a web page using MS Front page, adding graphics and images, Current web technologies. Hosting a web

site. Advance search techniques, case studies: Google & Yahoo and Google Scholar. Building an Intranet

Educational and Research resources on Net: Encyclopedia case study: Wikipedia, On line Tutorials and Lectures, Java Applets, Educational Applets, Virtual Labs, Electronic Journals, E-books, digital libraries. Searching research information using J-gate and Scopus.

Written Communication: Students prepare E-mails, letters, memos, proposals, formal and informal reports, work plans, and progress reports. Oral Communication: Impromptu and extemporaneous methods of delivery. Oral presentations using visual aids such as handouts, overhead transparencies, and presentation software such as PowerPoint.

REFERENCES

1. Research Methodology, C R Kothari
2. Information Communication Technology by Tim Shortis.
3. Handbook of Communication and Social Interaction Skills By John O. Greene, Brant Raney Burleson
4. Research Methodology: A Step-by-Step Guide for Beginners (Paperback) by Ranjit Kumar, SAGE Publications