



Royal College of Arts, Science and Commerce
(Autonomous)

Affiliated to University of Mumbai

Program: Bachelor of Science

Course: Computer Science

Open Elective Syllabus

For

Semester: I and II

Syllabus for Undergraduate Programme as per
National Education Policy (NEP-2020) with effect from the
academic year 2024-2025

Semester – I				
Course Code	Course Type	Course Title	Credits	Lectures /Week
RUCSOE104	Open Elective-I	Data Visualization using Excel	2	2
RUCSOE105	Open Elective-II	Fundamentals of Computers	2	2

Semester – II				
Course Code	Course Type	Course Title	Credits	Lectures / Week
RUCSOE204	Open Elective-I	IT Platforms, Tools and Practices	2	2
RUCSOE205	Open Elective-II	Google Workspace	2	2

Course/ Paper Title	Data Visualization using Excel
Course offered as	Open Elective- I
Course Code	RUCSOE104
Semester	I
No. of Credits	2 (30 hours)
No. of lecture Hours/week	2

Sr No.	Course Learning Objectives:
CLO1	Explain data and MS Excel with its features.
CLO2	Recognize various features of EXCEL and explain their usage.
CLO3	Describe referencing, using ranges and various functions.
CLO4	Demonstrate charts, filters and spreadsheet tools.
CLO5	Executing filters, pivot tables and macros.

Course Outcome

	On completing the course, the student will be able to:
CO1	Identify the various tabs, groups and tools features.
CO2	Demonstrate basic functions MS- Excel right from basics to tables.
CO3	Apply Excel tools and formulas to transform and structure your data.
CO4	Explain and apply steps to create pivot tables on given data.
CO5	Describe and develop various charts, filters and scenarios for given data.
CO6	Explain spreadsheet tools and develop macros.

Detailed Syllabus

Module	Title with content	No. of lectures
I	<p>Understanding data:What is data? Types of data: Qualitative & Quantitative data, Discrete data, Continuous data, Categorical data, Ordinal data.</p> <p>Introduction to Excel: Introduction, Applications of Excel, Spreadsheet window pane, Title Bar, Menu Bar, Standard Toolbar, Formatting Toolbar, the Ribbon, File Tab and Backstage View, Formula Bar, Workbook Window, Status Bar, Task Pane, Workbook & sheets.</p> <p>Operations on Rows & Columns : Selecting Columns & Rows, Changing Column Width & Row Height, Auto-fitting Columns & Rows, Hiding/Unhiding Columns & Rows, Inserting & Deleting Columns & Rows, Cell, Address of a cell, Components of a cell – Format, value, formula, Use of paste and paste special.</p> <p>Referencing: Relative, Absolute, Mixed Referencing.</p> <p>Functionality Using Ranges: Using Ranges, Selecting Ranges, Entering Information Into a Range, Using AutoFill.</p> <p>Creating Formulas:Using Formulas, Formula Functions – Sum, Average, if, Count, max, min, Proper, Upper, Lower, Using AutoSum.</p> <p>Advanced Excel Functions:Financial functions, Mathematical and statistical functions, Database functions, Conditional logic functions, String functions, Date functions, Statistical functions, Inferential statistics.</p>	15
II	<p>Spreadsheet Charts : Creating Charts, Different types of chart, Formatting Chart Objects, Changing the Chart Type, Showing and Hiding the Legend, Showing and Hiding the Data Table.</p> <p>Data Analysis : Sorting, Filters, Filter with customized condition, Subtotal, Text to Column, Using Scenarios, creating and managing a scenario. Using Goal Seek, Using Solver.</p> <p>Pivot Tables : Creating PivotTables, Manipulating a PivotTable, Using the PivotTable Toolbar, Changing Data Field, Properties, Displaying a PivotChart, Setting PivotTable Options, Adding Subtotals to PivotTables.</p> <p>Spreadsheet Tools :Moving between Spreadsheets, Selecting Multiple Spreadsheets, Inserting and Deleting Spreadsheets Renaming Spreadsheets, Splitting the Screen, Freezing Panes, Copying and Pasting Data between Spreadsheets, Hiding and Protecting worksheets.</p> <p>Making Macros:Recording Macros, Running Macros, Deleting Macros.</p>	15

References:

1. Rajkumar S and Nagarajan G and Naveen Kumar M, Fundamentals of MS Excel, Jayvee International Publications, Bangalore.
2. Microsoft Excel Latest Version Inside Out – Mark Doge and Craig Stinson – PHI Learning Private Limited, New Delhi – 110001.
3. Excel 2013 Bible ; John Walkenbach, Wiley

Additional References:

1. Financial Analysis and Modeling using Excel and VAB: Chandan Sengupta, Wiley
2. Excel Data Analysis – Modeling and Simulation: Hector Guerreor, Springer
3. Microsoft Excel 2013: Data Analysis and Business Modeling: Winston, PHI
4. Excel Functions and Formulas: Bernd Held, BPB Publications.

Evaluation for OE Theory Courses (2 Credit Courses) -

- **Class Test (25 marks)**
- **Project/Assignment/Case Study (20 Marks)**
- **Attendance (05 marks)**

Course/ Paper Title	Fundamentals of Computers
Course offered as	Open Elective- II
Course Code	RUCSOE105
Semester	I
No. of Credits	2 (30 hours)
No. of lecture Hours/week	2

Sr No.	Course Learning Objectives:
CLO1	To introduce the basic concepts of computers.
CLO2	To introduce the fundamentals of hardware, software and programming.
CLO3	To describe the concepts of operating systems and the internet.
CLO4	To familiarize the student with the basic taxonomy and terminology and concepts related to computers.

Course Outcome

	On completing the course, the student will be able to:
CO1	Explain the hardware and software requirements necessary for various computational tasks.
CO2	Describe the significance of primary and secondary storage in computing environments.
CO3	Describe the fundamental concepts of operating systems, networking, and the internet.
CO4	Recognize and explain different basic network topologies and their applications.
CO5	Understand the usage and purpose of various networking protocols.
CO6	Explain the latest features and functionalities of web browsers for effective internet use.

Detailed Syllabus

Module	Title with content	No. of lectures
I	<p>Computer Basics: Introduction to Computers: Definition of computer, characteristics of a Computer, History of computers, Generation of Computers. Classification of computers analog, digital and hybrid. Algorithms, Problem solving using computers</p> <p>Input/output Units: Input Devices-Keyboards, Mouse, Scanner, OMR, OCR, Barcode reader, Joystick, Tracker ball, Touch screen, MICR, Output devices monitor-different types, Printers-Impact and Non-Impact printers, plotter</p> <p>Computer Memory: Computer Memory: Elementary Concepts of Sequential and Random Access, Primary Storage Devices, RAM, ROM, Types of ROM PROM, EPROM, EEPROM. Secondary Storage Devices- Magnetic Disk Magnetic Drum, Magnetic Tape, Hard Disk, CDROM, DVD, Pen drive.</p>	15

	Computer Languages: Why programming languages? Assembly Language, Higher Level Programming Languages, Compiling High Level Language Program.	
II	<p>File system interface: File Concept, Access Methods, Directory Structure, File System Structure, Allocation Methods, and Free-Space Management. Basic DOS (Disk operating system) commands: cd, dir, copy, mkdir, clean etc. Basics of windows operating system, working with utilities of windows operating system like notepad, paint, word pad etc.</p> <p>Computer Network: Introduction to Data Communication System and Its Components, Networks, types of Connection and Topologies, LAN, MAN, WAN, Network Models- OSI Models, Layers in OSI Models, TCP/IP protocol.</p> <p>Internet: Introduction to Internet and its Applications, Connecting to the Internet, Client/Server Technology, Internet as a Client/Server Technology, Email, Video-Conferencing, Internet Service Providers, Domain Name Server, Internet Address, Internet Protocols (IP. TCP, HTTP, FTP, SMTP, POP, Telnet), Introduction to Intranet, Internet vs. Intranet vs. Extranet, Advantages & Disadvantages of Intranet.</p> <p>WWW: World Wide Web and Its Evolution, Architecture of Web. Uniform Resource Locator (URL), Browsers: Internet Explorer, Netscape Navigator, Opera, Firefox, Chrome, Mozilla.</p>	15

References:

1. Rajaraman. V: Fundamentals of Computers, Prentice Hall India,2004.
2. Peter Norton's, "Introduction to Computers", 7th Edition, Tata McGraw-Hill, 2010, ISBN: 9780070671201
3. Forouzan, B. A., &Fegan, S. C. New York: "Data communications and networking", McGraw-Hill Higher Education, 2007.

Additional References:

1. Computer Basics Absolute Beginner's Guide By Michael Miller and Mike Miller.

Evaluation for OE Theory Courses (2 Credit Courses) -

- **Class Test (25 marks)**
- **Project/Assignment/Case Study (20 Marks)**
- **Attendance (05 marks)**

Sr No.	Course Learning Objectives:
CLO1	Prepare students according to the industry standards.
CLO2	Awareness on industry practices and ethics.
CLO3	Encourage the use of IT Tools so as to enable students to improve their skills and knowledge
CLO4	Impart skills that can enable students to approach business problems analytically.
CLO5	Impart collaboration techniques using GitHub and contribute to open source projects.

Course Outcome

	On completing the course, the student will be able to:
CO1	Explain the industry standards and practices in coding.

CO2	Describe the principles and significance of open-source software, along with its practical applications.
CO3	Identifying the applications, benefits and features of Open-Source Technologies.
CO4	Evaluate various IT tools and services for betterment of knowledge.
CO5	Describe the purpose and functionality of GitHub, Design and publish a website using WordPress.

Detailed Syllabus

Module	Title with content	No. of lectures
I	<p>Free and Open Source Software Introduction: Introduction: Open Source, Free Software, Free Software vs. Open Source software, Public Domain Software, FOSS does not mean no cost. History: BSD, The Free Software Foundation and the GNU Project. GitHub: Introduction to GitHub, preparing the environment: Install Git on our machine, create a GitHub account, create a workspace on our machine GitHub workflow and the environment: Creating a repository, creating workspace, cloning the repository, creating a branch, committing the changes, merging the changes. Wikipedia: Introduction, contributing to Wikipedia by editing articles and adding content.</p>	15
II	<p>Practical Applications of Open-Source Software Introduction to LibreOffice: Hands-on session on using LibreOffice for word processing, spreadsheets, and presentations. Open Source Programming Language: Python: Syntax and Style, Python Objects, Variables, Keywords, Sets, Operators, Input and Output Numbers , Strings , Lists and Tuples , Dictionaries , Conditionals. Content Management with WordPress: Introduction to WordPress for creating and managing websites and blogs.</p>	15

References:

1. Python: The Complete Reference, Martin C. Brown, McGraw Hill, 2018
2. Beginning Python: From Novice to Professional, Magnus Lie Hetland, Apress, 2017
3. Wesley J. Chun, "Core Python Programming", Prentice Hall, 2001
4. "Open-Source Technology", Kailash Vadera & Bhavyesh Gandhi, University Science Press, Laxmi Publications, 2009 . "Open-Source Technology and Policy", Fadi P. Deek and James A. M. McHugh, Cambridge University Press, 2008.

Additional References:

1. Open Source Initiative: <https://opensource.org/>
2. Github: <https://help.github.com/>
3. Wikipedia: <https://en.wikipedia.org/7>. https://en.wikipedia.org/wiki/Wikipedia:Contributing_to_Wikipedia8
4. <https://wordpress.com/go/tutorials/what-is-a-cms/>
5. Python Programming by Kiran Gurbani and Ashwin Mehta, Himalaya Publications. 2018

Evaluation Pattern (2 Credit Courses) (50 marks)

- Class Test (25 marks)
- Project/Assignment/Case Study (20 Marks)
- Attendance (05 marks)

Course/ Paper Title	Google Workspace
Course offered as	Open Elective- II
Course Code	RUCSOE205
Semester	II
No. of Credits	2 (30 hours)
No. of lecture Hours/week	2

Sr No.	Course Learning Objectives:
CLO1	Understand Google Workspace and its applications.
CLO2	Encourage proficiency in key features of Google workspace application.
CLO3	Impart proficiency in Google workspace to collaborate, manage tasks and communicate effectively.
CLO4	Encourage students to implement their use in educational and professional contexts.

Course Outcome

	On completing the course, the student will be able to:
CO1	Explain the purpose and functionality of email communications with Gmail.
CO2	Describe the integration between Google Calendar, Gmail, and Google Meet for efficient scheduling and communication.
CO3	Evaluate documents, spreadsheets and presentations.
CO4	Design Google Forms, collect data for surveys and generate reports.
CO5	Design a Google Classroom environment by adding students, co-teachers, and resources for effective teaching and learning.
CO6	Use to navigate the functionalities of Google Maps.

Detailed Syllabus

Module	Title with content	No. of lectures
I	Mastering email communication with Gmail: Setting up a Google account and accessing Google Workspace, Set Profile information and Photo, Send and Receive emails, Organize emails using labels, filters, and stars for easy retrieval and management, Utilize Gmail's advanced features like scheduling emails, snoozing emails, and setting reminders. Google Calendar , Meet and Chat : Create a new calendar, Create an event in Google Calendar, Set reminders and alarms , Share a Calendar with Other People ,Integrate with Gmail and other apps. Scheduling and managing Google Meet events, screen sharing, chat, annotations and recording, Creating public and private Google Chat rooms ,Inviting and managing participants in Google Chat rooms, Utilizing Chat room	15


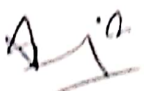
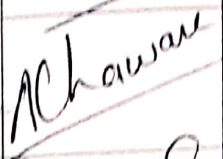
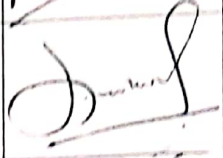
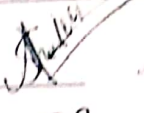

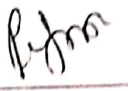

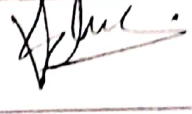


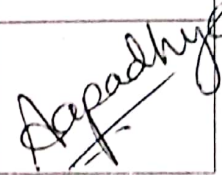
	<p>features like sharing files, links, and multimedia, pinning messages, and polls.</p> <p>Google Drive :Managing files and folders in Google Drive, Sharing files and folders with collaborators and setting access permissions.</p> <p>Google Forms: Create a Form, Choose Settings for a Form, Add Questions to a Form, Add Images to a Question, Import Questions from an Existing Form, Create a Form with Multiple Sections, Add Collaborators to a Form, Preview and Test a Form, Send a Form to Its Respondents, View the Responses to a Form, Analyze form responses and generate reports.</p> <p>Google Classroom: Create and set up a Google Classroom, Add Students and Co-Teachers, Using Google Classroom to share resources, Create assignment, Set due dates and points, Use rubrics for grading, Integrate quizzes created using Google Form with Google Classroom</p>	
II	<p>Google Docs: Document creation with Google Docs, Apply Basic Formatting to Text , Inserting Images, Creating tables, Format a document with styles, Using Find and Replace, Using Regular Expressions for Advanced Searching, Sharing and Collaborating on files.</p> <p>Google Sheets :Insert, delete and manage sheets , Insert a Function, Format Spreadsheets, Cells, and Ranges, Apply Number Formatting and Conditional Formatting, Choose Spreadsheet Settings, Merge Cells, Wrap and Rotate Cell Contents, Sort and Filter Data, Apply Data Validation to Your Sheets, Protect Ranges in a Sheet, Protect a Sheet.</p> <p>Google Slides: Add a Slide to a Presentation, Import Slides from an Existing Presentation, Understanding and Using Views, Work with Text Boxes, Add Audio and Video to a Slide, Insert Shapes and Word Art, Add a Transition and Animations, Edit a Slide Master, Organize the Slides in a Presentation.</p> <p>Google Maps: Search on Maps, Different Map Views (Satellite, Terrain, Street View), Customizing Maps, Get to your destination, Sharing Maps with Others.</p> <p>Google Sites: Creating and building simple websites using Google Sites, Adding content, images, and widgets to websites.</p>	15

References:

1. Team, Z. (2017). The Ultimate Guide to G-Suite. Lean Pub G-Suite.
2. Iyer, b. (2022). Google workspace user guide: a practical guide to using google apps efficiently while integrating them with your data.
3. Hart-Davis, G. (2021). Teach Yourself Visually Google Workspace. Visual.

Evaluation Pattern (2 Credit Courses) (50 marks)

1. **Class Test (25 marks)**
2. **Project/Assignment/Case Study (20 Marks)**
3. **Attendance (05 marks)**

Name	Affiliation	Sign
Ms. Ritika Lala	Royal College of Arts, Science and Commerce Mira Road, Thane.	
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Mr. Vinay Dubey	Royal College of Arts, Science and Commerce Mira Road, Thane.	
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