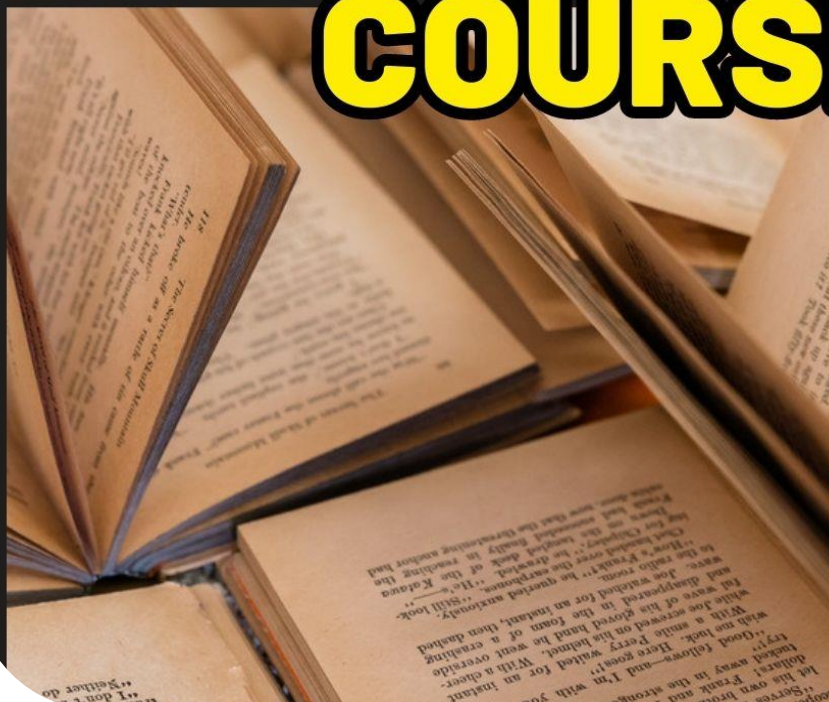# SHRI GURU RAM RAI UNIVERSITY DEHRADUN

VALUE ADDED COURSES

SGRRU

SGRR UNIVERSITY

Brochure of Value-Added Courses
School of Computer Application & Information Technology
2019-2020

ABOUT THE UNIVERSITY

Shri Guru Ram Rai University was established by a religious and philanthropic leader, Shri Mahant Devendra Dass Ji Maharaj in the year 2017. It is situated in the heart of city, Uttarakhand. We are extremely privileged to extend the values and ethos of the Shri Guru Ram Rai Education mission through SGRR University to impart quality education and in successfully placing more than 80% students in various companies across the globe. SGRR University has humongous campus spread over 80 acres of land. Its state-of-art facilities give opportunities to develop leadership skills and to achieve professional excellence. It has 5500+ students from different countries, 29 states and Union Territories and providing cultural melange and global exposure to our students. One of the biggest boosts from University is its unmatched experience of delivering quality education that helps to develop confidence and will give you more knowledge, industry exposure, building good networking and high self-esteem. This will change your overall personality and develop you into a complete professional to face any challenge.

Index

Traditional education provides a strong foundation, but to stay competitive and relevant, individuals must continually enhance their skill set. Enter value-added courses, a gateway to a world of specialized expertise designed to complement and enrich existing knowledge.

Value-added courses go beyond the conventional academic curriculum, offering practical insights and hands-on experience in niche areas. These courses are meticulously crafted to bridge the gap between theoretical learning and real-world application, empowering individuals to navigate the complexities of contemporary professional landscapes.

Conduction of value added courses :

Value Added Course is not mandatory to qualify for any programme and the credits earned through the Value-Added Courses shall be over and above the total credit requirement prescribed in the curriculum for the award of the degree. It is a teacher assisted learning course open to all students without any additional fee.

Classes for a VAC are conducted during the RESERVED Time Slot in a week or beyond the regular class hours The value-added courses may be also conducted during weekends / vacation period. A student will be permitted to register only one Value Added Course in a Semester.

student will be encouraged to opt for the VAC offered by his/her parent Department/Faculty. Industry Experts / Eminent Academicians from other Institutes are eligible to offer the value-added course. The course can be offered only if there are at least 5 students opting for it. The students may be allowed to take value added courses offered by other departments after obtaining permission from Dean offering the course. The duration of value added course is 30 hours with a combination 18 hours (60%) of theory and 12 hours (40%) of practical. However, the combination of theory and practical shall be decided by the course teacher with the approval of the Dean

Guidelines for conducting value added courses

- ❖ Value Added Course is not mandatory to qualify for any program.
- ❖ It is a instructor supported learning course open to all students without any added fee.
- ❖ Classes for VAC will be conducted during the **RESERVED** Time Slot in a week or beyond the regular class hours.

❖ The value-added courses may be also conducted during weekends / vacation period.

❖ A student will be permitted to register only one Value Added Course in a Semester.

❖ Students may be permitted to enrol in value-added courses offered by other departments/ Schools after obtaining permission from the Department's Head offering the course.

Duration and venue

❖ The duration of value-added course should not be less than 30 hours.

❖ The Dean of the respective School shall provide class room/s based on the number of students/batches.

❖ VAC shall be conducted in the respective School itself.

Registration procedure

The list of Value-Added Courses, along with the syllabus, will be available on the University Website. A student must register for a Value-Added Course offered during the semester by completing and submitting the registration form. The Department Head shall segregate according to the option chosen and send it to the Dean of the school offering the specific Value-Added Courses.

- Each faculty member in charge of a course is responsible for maintaining Attendance and Assessment Records for candidates who have registered for the course.

- The Record must include information about the students' attendance and Assignments, seminars, and other activities that were carried out.

- The record shall be signed by the Course Instructor and the Head of the Department at the end of the semester and kept in safe custody for future verification.

- Each student must have a minimum of 75% attendance in all courses for the semester in order to be eligible to take certificate.

- Attendance requirements may be relaxed by up to 10% for valid reasons such as illness, representing the University in extracurricular activities, and participation in NCC.

- The students who have successfully completed the Value Added Course shall be issued with a Certificate duly signed by the Authorized signatories.

Computer and Ethics

Course Code: VAC2019-39

Course Objective:
This course aims to instill a strong ethical foundation in individuals involved in the field of computing, emphasizing the importance of responsible conduct and ethical decision-making in a technologically driven society.

Course Outcomes
- Understand ethical considerations in computing and information technology.
- Explore the ethical dimensions of privacy, cybersecurity, and social media.
- Apply ethical decision-making models to resolve ethical dilemmas in computing.
- Evaluate the social and cultural impacts of technology on society.
- Develop ethical guidelines for responsible technology use and development.

Module I: Introduction to Computers and Ethics
Introduction to ethical theories and frameworks, Ethical decision-making models and approaches, Ethical considerations in computing and information technology, Historical perspectives on computers and ethics

Module II: Privacy and Data Protection
Concepts of privacy and data protection, Ethical issues related to data collection, storage, and sharing, Legal and regulatory frameworks for privacy, Privacy-enhancing technologies and practices.

Module III: Cybersecurity and Ethical Hacking
Fundamentals of cybersecurity and its importance, Ethical considerations in hacking and penetration testing, Ethical hacking techniques and methodologies, Legal and ethical issues related to vulnerability disclosure, Cybersecurity ethics in the context of organizational security practices

Module IV: Social Media and Online Ethics
Social media ethics and responsible online behavior, Privacy risks and ethical dilemmas in social media usage, Cyberbullying, harassment, and online hate speech, Implications of social media algorithms and filter bubbles, Social media and its impact on democracy and political discourse

Module V: Technology and Society
Ethical issues arising from the digital divide, Social and cultural impacts of technology, Ethical considerations in emerging technologies (e.g., blockchain, virtual reality), Technology addiction and its ethical implications, Ethical

responsibilities of technology professionals

Text Books:
- Computers and Society: Modern Perspectives by by Ronald M. Baecker
- The Handbook of Information and Computer Ethics by Kenneth Einar Himma and Herman T. Tavani.

Spreadsheet using MS excel

Course Code: VAC2019-40

Course Objectives:

This course is designed to elevate the Excel skills of students and professionals, preparing them for advanced data management and analysis tasks in a variety of professional settings.

Course Outcomes:

- Proficiency in managing and navigating Excel workbooks and worksheets.
- Ability to utilize functions, conditional formatting, and filters effectively.
- Competence in creating and customizing various types of charts for data visualization.
- Mastery of advanced Excel features for complex data analysis.
- Skills in integrating Excel with other tools for enhanced data management and reporting.

Course Content:

Module I: Excel Basics and Workbook Management

- Navigating worksheets, entering/editing text and values
- Formulas: entry, editing, moving, copying
- Data range management: entering, deleting ranges, rows, columns
- Workbook navigation and management, adding sheets

Module II: Functions and Formatting in Excel

- Functions: entering, autosum, common functions
- Text and number formatting
- Conditional formatting, applying filters for data analysis

Module III: Excel Charting Techniques

- Chart creation: pie, bar, line charts
- Chart customization: data values, legends, formatting

Module IV: Advanced Excel Features

- Introduction to VLOOKUP, HLOOKUP
- Creating and managing Pivot Tables for advanced data analysis

Module V: Integrating Excel with Other Tools

- Data import/export with other software
- Introduction to Excel integrations (e.g., Power BI)

References:

- "Excel 2019 Bible" by Michael Alexander, Richard Kusleika
- "Excel Data Analysis For Dummies" by Paul McFedries
- "Microsoft Excel 2019 Pivot Table Data Crunching" by Bill Jelen, Michael Alexander

Data Analytics using Python

Course Code: VAC2019-41

Course Objectives:

This course is designed to equip students with practical, hands-on experience in data analytics using Python. By mastering Python and its powerful libraries, students will be able to process, analyze, and visualize data, laying a strong foundation for careers in data science, business analytics, and related fields.

Course Outcomes

- Gain proficiency in Python for data manipulation and analysis.
- Master data processing and analysis using Pandas and NumPy.
- Develop skills in creating insightful data visualizations with Matplotlib and Seaborn.
- Complete a practical data science project from start to finish.
- Enhance analytical and problem-solving abilities in real-world data scenarios.

Modul I: Introduction to Python

Syntax, Variables, and Data Types, Basic Operations: Arithmetic, Comparison, Logical Operators

Control Structures: if-else, for loops, while loops, Data Structures: Lists, Tuples, Sets, Dictionaries, Reading and Writing Files, Introduction to Python Libraries for Data Science, Setting up Python Environment: Anaconda, Jupyter Notebooks, Introduction to Virtual Environments

Module II: Introduction to NumPy and Basic Data Processing

Understanding NumPy Arrays, Array Operations: Indexing, Slicing, Iterating, Basic Statistical Functions, Array Manipulations: Reshaping, Stacking, Splitting, Broadcasting and Vectorized Operations, Working with Dates and Time, Reading Data: CSV, Excel, SQL Database, Basic Data Cleaning Techniques, Data Transformation: Filtering, Sorting, Aggregating

Module III: Introduction to Pandas

Introduction to Pandas Data Structures: Series, Data Frame, Data Indexing and Selection, Handling Missing Data, Advanced Data Frame Operations, Grouping and Aggregating Data, Merging, Joining, and Concatenating Data Frames, Data Exploration and Analysis Techniques, Exporting Data to Different Formats

Module IV: Data Visualization

Basic Plotting with Matplotlib, Customizing Plots: Labels, Legends, Colors, Different Types of Plots: Line, Bar, Histogram, Scatter, etc., Advanced Data Visualization with Seaborn, Statistical Data Visualization Techniques, Seaborn Styles and Color Palettes

References :

- Pandas for everyone, Python Data Analysis by Daniel Y. Chen, Pearson publication
- Laura Igual, Santi Seguí, "Introduction to Data Science - A Python Approach to Concepts,
- Wes McKinney, "Python for Data Analysis", O'Reilly
- Luca Massaron, John Paul Mueller, "Python for Data Science for Dummies"

Course Objective:

This course aims to provide students with the knowledge and skills required to effectively utilize social media and web analytics for data-driven decision-making in digital marketing and online presence management.

Course Outcomes:

- Understand the role of web analytics within the digital marketing landscape
- Identify, define and interpret commonly used web metrics and KPIs.
- Understand analytical methods to transform social media data into marketing insights
- Understand the process of informed decision making using case based method.
- Understand how to effectively use insights to support website design decisions, campaign optimization, search analytics, etc.

Module I: Social Media & Analytics

Introduction to Social Media, Social Media Landscape, Social Media Analytics & its Need. SMA in Small and Large Organisations; Application of SMA in Different Social Media Platforms.

Introduction to Web Analytics

Definition, Process, Key Terms: Site References, Keywords and Key Phrases; Building Block Terms: Visit Characterization Terms, Content Characterization Terms, Conversion Metrics; Categories: Offsite Web, on Site Web; Web Analytics Platform, Web Analytics Evolution, Need of Web Analytics, Advantages & Limitations.

Module II: Network Fundamentals

The Social Networks Perspective - Nodes, Ties and Influencers, Social Network, Web Data and Methods.

Data Collection and Web Analytics Fundamentals: Capturing Data: Web Logs, Web Beacons, Java Script Tags, Packet Sniffing; Outcome Data: E-commerce, Lead Generation, Brand/ Advocacy and Support; Competitive Data: Panel Based Measurement, ISP Based Measurement, Search Engine Data; Organisational Structure.

Module III: Web Metrics & Analytics Common Metrics:

Hits, Page Views, Visits, Unique Page Views, Bounce, Bounce Rate & its Improvement, Average Time on Site, Real Time Report, Traffic Source Report, Custom Campaigns,

Content Report, Google Analytics; Key Performance Indicator: Need, Characteristics, Perspective and Uses.

Graphs and Matrices- Basic Measures for Individuals and Networks. Random Graphs & Network Evolution, Social Context: Affiliation & Identity

Web analytics Tools: A/B testing, Online Surveys, Web Crawling and Indexing. Natural Language Processing Techniques for Micro-Text Analysis

Module IV : Facebook Analytics:

Introduction, Parameters, Demographics. Analyzing Page Audience: Reach and Engagement Analysis. Post-Performance on FB; Social Campaigns: Goals and Evaluating Outcomes, Measuring and Analyzing Social Campaigns, Social Network Analysis Like Instagram, Twitter, LinkedIn, YouTube etc. AdWords, Benchmarking, Categories of Traffic: Organic Traffic, Paid Traffic;

Google Analytics: Brief Introduction and Working, Google Website Optimizer, Implementation Technology, Limitations, Performance Concerns, Privacy Issues

Module V Qualitative Analysis:

Heuristic Evaluations: Conducting a Heuristic Evaluation, Benefits of Heuristic Evaluations; Site Visits: Conducting a Site Visit, Benefits of Site Visits; Surveys: Website Surveys, Post-Visit Surveys, Creating and Running a Survey, Benefits of Surveys.

Web analytics 2.0: Web Analytics 1.0 & its Limitations, Introduction to WA 2.0, Competitive Intelligence Analysis and Data Sources; Website Traffic Analysis: Traffic Trends, Site Overlap and Opportunities

References:

- Social Media Analytics: Techniques and Insights for Extracting Business Value Out of Social Media, Matthew Ganis, Avinash KohirkarIntroduction". Routledge Books, 2nd edition, 2021
- Social Media Metrics: How to Measure and Optimize Your Marketing Investment, Jim Sterne
- Social Media Analytics, Marshall Sponder
- Social Media ROI: Managing and Measuring Social Media Efforts in Your Organization (Que Biz-Tech), Oliver Blanchard

Course Objective:

These course objectives aim to provide participants with a foundational knowledge of network security and firewalls, ensuring they can comprehend, configure, and manage basic firewall functionalities. The objectives also emphasize practical skills in implementing firewall policies and rules, laying the groundwork for more advanced studies in cybersecurity or network administration.

Course Outcomes:
- Understand the fundamentals of network security.
- Explore the role of firewalls in securing computer networks.
- Identify different types of firewalls and their features.
- Learn the principles of firewall rule configuration and implementation.
- Gain hands-on experience in configuring and managing firewalls.
- Analyze and troubleshoot common firewall issues.

Course Content:

Module I: Introduction to Network Security

Overview of network security, Importance of firewalls in network defense, Common threats and vulnerabilities

Unit II : Types of Firewalls

Packet filtering firewalls, Stateful inspection firewalls, Proxy firewalls, Application layer firewalls; Advanced Firewall Concepts: Virtual firewalls, Cloud-based firewalls, Next-generation firewalls (NGFW), Threat intelligence integration

Unit III: Firewall Components and Architecture

Hardware vs. software firewalls, Firewall appliances, Dual-homed gateway, DMZ (Demilitarized Zone)

Unit IV: Firewall Rule Configuration, Policies and Best Practices

Understanding firewall rules, Rule syntax and structure, Rule evaluation and processing, Common rule actions, Creating and managing firewall policies, Best practices for firewall configuration, Auditing and monitoring firewall activities, Intrusion Detection and Prevention Systems (IDPS), Integration of IDPS with firewalls, Collaborative threat intelligence, Signature-based vs. anomaly-based detection.

References :

- "Firewalls and Network Security: Principles and Practices" by William Stallings
- "Web Application Security: A Beginner's Guide" by Bryan Sullivan and Vinod Vasudevan
- "Network Security Essentials: Applications and Standards" by William Stallings and Dharam Veer Singh
- "Firewall Fundamentals" by Wes Noonan and Ido Dubrawsky