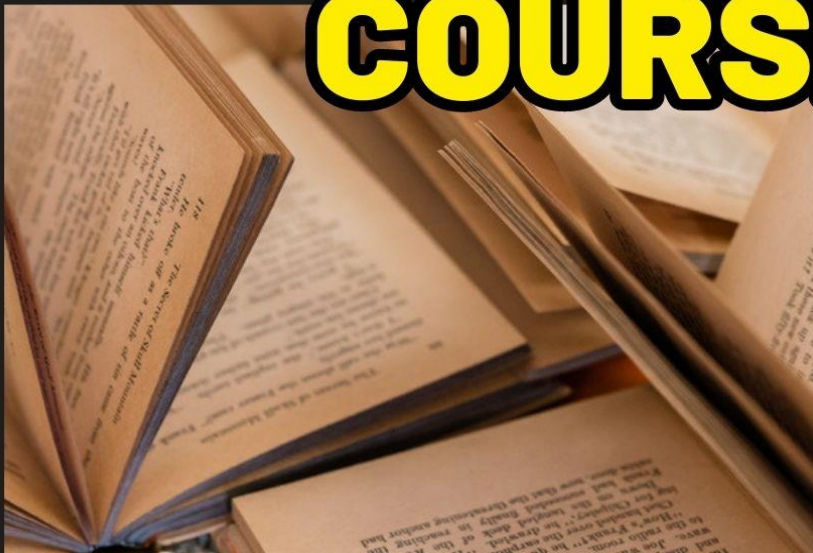




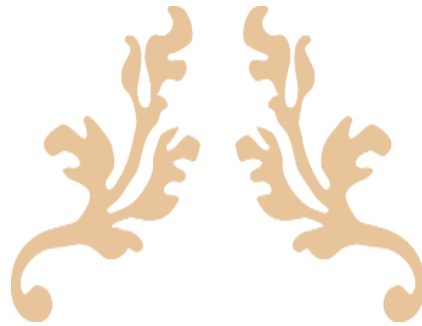
SHRI GURU RAM RAI UNIVERSITY DEHRADUN



VALUE ADDED COURSES



SGRRU



SGRR UNIVERSITY

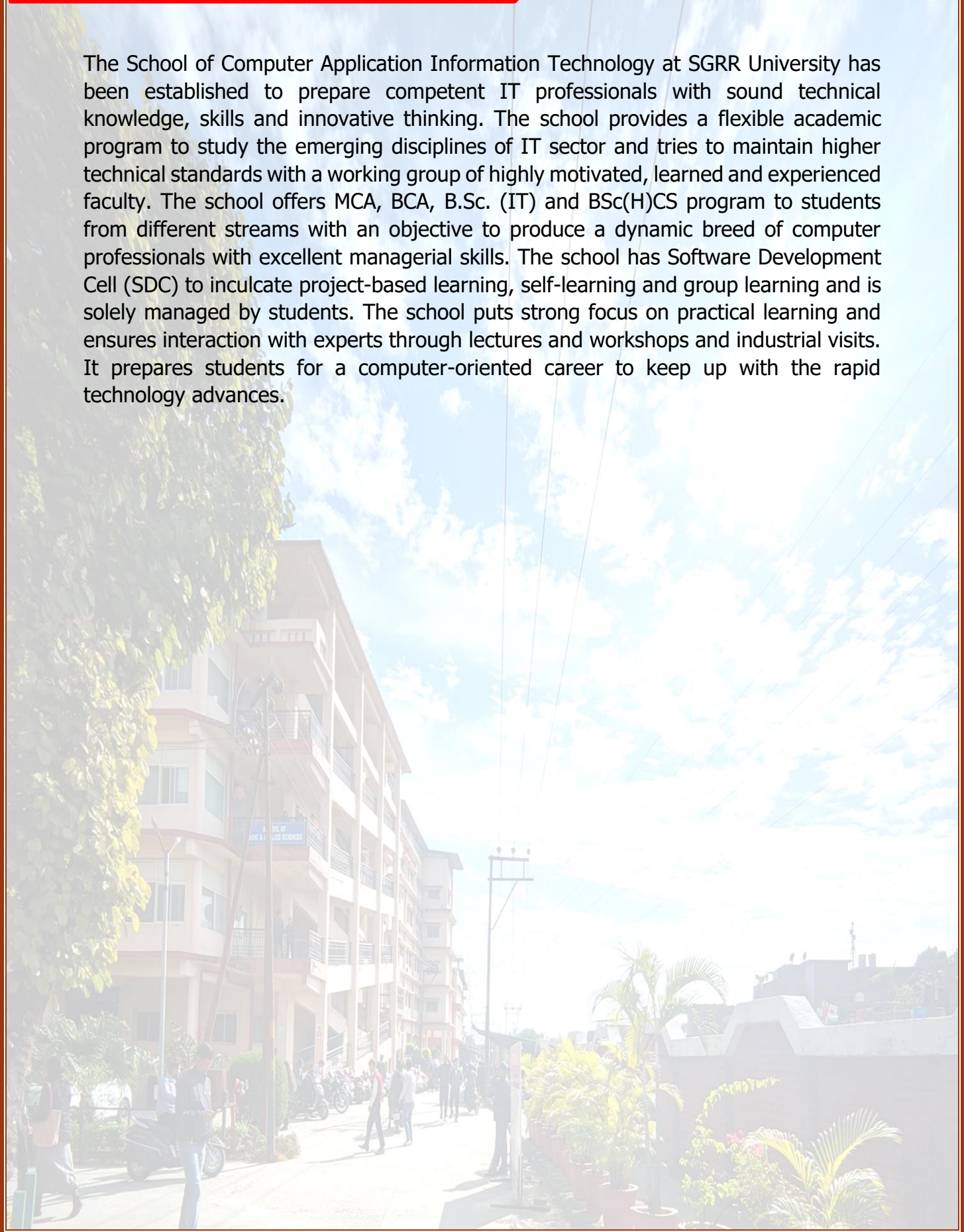
Brochure of Value-Added Courses



School of Computer Application & Information Technology

ABOUT THE SCHOOL

The School of Computer Application Information Technology at SGRR University has been established to prepare competent IT professionals with sound technical knowledge, skills and innovative thinking. The school provides a flexible academic program to study the emerging disciplines of IT sector and tries to maintain higher technical standards with a working group of highly motivated, learned and experienced faculty. The school offers MCA, BCA, B.Sc. (IT) and BSc(H)CS program to students from different streams with an objective to produce a dynamic breed of computer professionals with excellent managerial skills. The school has Software Development Cell (SDC) to inculcate project-based learning, self-learning and group learning and is solely managed by students. The school puts strong focus on practical learning and ensures interaction with experts through lectures and workshops and industrial visits. It prepares students for a computer-oriented career to keep up with the rapid technology advances.



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	Course Code	Course Name	Contact Hours	Page No.
Sr. No.	Introduction to value added Courses and guidelines		-	4-6
1	VACCAIT001	Web development using java	90 Hours	8-9
2	VACCAIT002	Ethical Hacking	60 Hours	10
3	VACCAIT003	Digital Image Processing	30 Hours	11-12
4	VACCAIT004	Search Engine Optimization (SEO)	30 Hours	13-14



INTRODUCTION

The ever-changing global scenario makes the world more modest and needs high levels of lateral thinking and the spirit of entrepreneurship to cope up with the emergent challenges. Many a times, the defined skill sets that are being imparted to students today with Programme Specific Objectives in educational institutions become redundant sooner or later due to rapid technological advancements. No university curriculum can adequately cover all areas of importance or relevance. It is important for higher education institutions to supplement the curriculum to make students better prepared to meet industry demands as well as develop their own interests and aptitudes.

Objectives The main objectives of the Value-Added Course are:

- ✓ To provide students an understanding of the expectations of industry.
- ✓ To improve employability skills of students.
- ✓ To bridge the skill gaps and make students industry ready.
- ✓ To provide an opportunity to students to develop inter-disciplinary skills.
- ✓ To mould students as job providers rather than job seekers.

Course Designing The department interested in designing a Value Added Course should undertake Training Need Analysis, discuss with the generic employers, alumni and industrial experts to identify the gaps and emerging trends before designing the syllabus.

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 an 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.





**SCHOOL OF
COMPUTER APPLICATION
&
INFORMATION TECHNOLOGY**

Web Application Development in Java

Course Code: VACCAIT001

Course Objectives

1. To bridge the gap between academics and technology prevailing in the industry.
2. To give exposure to students about latest and emerging trends in IT industry.
3. To bring close the industry experts and students.
4. To learn how to develop software projects as per standards of IT industry

Course Outcomes

1. Student will be able to understand, analyse build and test software as per new prevailing technologies in IT industry.
2. It will increase the confidence in student to face interview and answer question based on project development
3. Students are benefited for better employability and help in placements of students

Module I: Introduction of Web Application, 3-Tier Architecture, Advantages, Disadvantages, Scope & Examples of Web Application.

Module II: Overview of Client Side and Server Side Technologies that is (HTML, CSS, Javascript, JQuery, Ajax, Xml, Java, Servlets, Jsp, Tomcat server and Database. Getting Account Information of Different User Without Loading Page Using Ajax Request.

Module III: Installation/Configuration of Java & Tomcat Server, Start Making First Web Application. Html Form Elements Overview with Practical Demonstration. Implicit Variables. Send SMS, Email from Web Application. Uploading / Retrieving of Image/File.

Module IV: Introduction of Javascript and its Practical Implementation in Client Side Validation. Database Basics, SQLQueries Implementation in MySQL.

Module V: Servlets Overview, Servlets Life Cycle, Servlet Context, Servlet Config. XML Mapping, Servlet Coding for Login Page with Database Connectivity to Demonstrate Authentication. Introduction to JSP, Session Management. JSP Scripting Elements, Page Directives, Implicit Dynamic JSP Page, Connectivity of Data Base In JSP Page, Listing Of all Account Users With All Details.

Reference Books:

1. Lynn Beighley, Head First SQL, 1st edition O'Reilly Media Publications.
2. Sarika Agarwal ,Vivek Gupta , Java for Web Development BPB Publications.
3. Prem Kumar, Web Design with HTML & CSS, 1st edition Notion Press.



Certificate Course in Ethical Hacking

Course Code: VACCAIT002

Course Objectives:

1. To bridge the gap between academics and technology prevailing in the industry.
2. To give exposure to students about latest and emerging trends in IT industry.
3. To bring close the industry experts and students.
4. To learn how to develop software projects as per standards of IT industry

Course Outcomes:

1. Student will be able to understand, analyse build and test software as per new prevailing technologies in IT industry.
2. It will increase the confidence in student to face interview and answer question based on project development
3. Students are benefited for better employability and help in placements of students

Module I Introduction of hacking and its scope, networking basic, networking advance.

Module II Installation of kali Linux and basic commands. What is IP and MAC address how to change it, gaining access server-side attack. gaining access client-side attack.

Module III social engineering attack, spoofing emails with smtp server. Introduction to beef framework with attack.

Module IV Website hacking info gathering/SQL injection, website hacking cross site scripting. Brute force attack with examples, DoS attack with explanation

Reference Books:

1. Introduction to Cyber Security: Guide to the World of Cyber Security by Anand Shinde Paperback
2. Cybersecurity for Beginners: Learn the Fundamentals of Cybersecurity in an Easy, Step-by-Step Guide by Kevin Clark

Course Outcomes:

1. Understand the principles of digital image processing and its applications.
2. Analyze and enhance images using various image processing techniques.
3. Apply mathematical and statistical techniques to analyze images.
4. Design and implement image processing algorithms using programming languages.
5. Evaluate the performance of image processing algorithms and compare their effectiveness.
6. Use image processing tools and libraries for various applications.

Module I : Introduction to Digital Image Processing

Overview of Digital Image Processing, Components of an Image Processing System, Applications of Digital Image Processing.

Module II : Digital Image Fundamentals

Elements of Visual Perception, Sampling and Quantization, Pixel Relationships, Color Models

Module III : Image Enhancement in the Spatial Domain

Gray Level Transformations, Histogram Processing, Point Processing, Spatial Filtering

Module IV: Image Enhancement in the Frequency Domain

Fourier Transform, Discrete Fourier Transform, Filtering in the Frequency Domain, Image Smoothing and Sharpening

Module V: Image Restoration

Image Degradation Model, Noise Models, Restoration in the Presence of Noise, Linear Filters for Restoration

Module VI : Color Image Processing

Color Models and Color Image Processing, Color Transformations, Color Image Enhancement, Color Image Segmentation

Module VII : Image Compression

Fundamentals of Image Compression, Lossless Compression Techniques, Lossy Compression Techniques, Image Compression Standards

Module VIII : Image Segmentation

Thresholding Techniques, Edge-Based Segmentation, Region-Based Segmentation, Clustering-Based Segmentation

Module IX : Object Recognition

Recognition Based on Decision-Theoretic Methods, Structural Methods, Template Matching, Neural Networks

Module X : Image Processing Applications

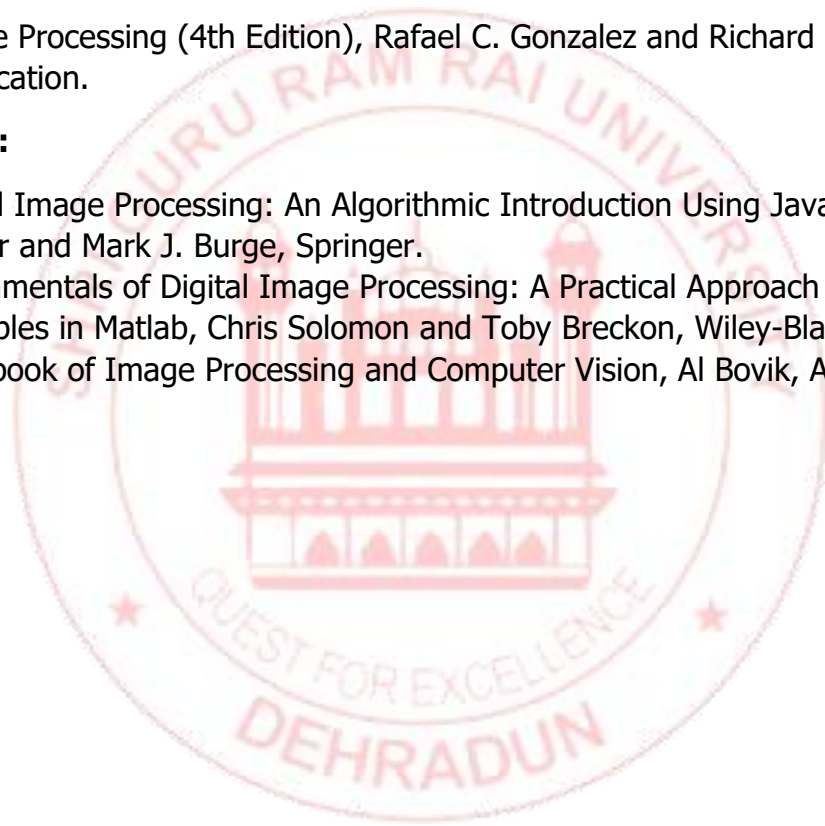
Medical Imaging, Multimedia, Computer Vision

Course Textbook:

Digital Image Processing (4th Edition), Rafael C. Gonzalez and Richard E. Woods, Pearson Education.

References:

- Digital Image Processing: An Algorithmic Introduction Using Java, Wilhelm Burger and Mark J. Burge, Springer.
- Fundamentals of Digital Image Processing: A Practical Approach with Examples in Matlab, Chris Solomon and Toby Breckon, Wiley-Blackwell.
- Handbook of Image Processing and Computer Vision, AI Bovik, Academic Press.



Search Engine Optimization (SEO)

Course Code : VACCAIT004

Course Outcomes:

1. Understand the principles and importance of SEO
2. Conduct keyword research and identify relevant keywords for a website
3. Optimize website content for search engines
4. Analyze website performance using SEO tools
5. Understand the role of link building in SEO
6. Measure the effectiveness of SEO campaigns
7. Develop a comprehensive SEO strategy for a website

Module I : Introduction to SEO

What is SEO?, Why is SEO important?, Types of SEO

Module II : Keyword Research

Understanding search intent, Keyword research tools, Analyzing keyword competition

Module III: On-page Optimization

Title tags, meta descriptions, and header tags, Content optimization, Image optimization URL optimization, Internal linking

Module IV: Technical SEO

Site structure and navigation, Page speed optimization, Mobile optimization, Schema markup

Module V : Off-page Optimization

Link building, Social media optimization, Local SEO

Module VI : Measuring SEO Performance

Google Analytics, Google Search Console, SEO reporting

Module VII : Developing an SEO Strategy

Setting goals and objectives, Conducting a website audit, Competitive analysis. Creating an SEO roadmap

Textbook:

- "Search Engine Optimization For Dummies" by Peter Kent

- "The Art of SEO" by Eric Enge, Stephan Spencer, and Jessie Stricchiola
- "Search Engine Optimization All-in-One For Dummies" by Bruce Clay
- "Content Marketing Strategies For Dummies" by Stephanie Diamond
- "Social Media Marketing All-in-One For Dummies" by Jan Zimmerman and Deborah Ng

