



SGT UNIVERSITY

VALUE ADDED COURSES



**Faculty of Engineering &
Technology 2023-24**



About the University

SGT University, established in 2013 and recognized by the University Grants Commission (UGC), has set its sights on fostering a culture of research, innovation, and interdisciplinary education. Nestled on a sprawling 70-acre campus on the outskirts of Gurgaon, the university boasts state-of-the-art resources and infrastructure designed to facilitate cutting-edge academic and research achievements.

Driven by a relentless pursuit of excellence, SGT University has earned the prestigious NAAC A+ accreditation, becoming one of the youngest institutions in the country to receive this honour. This recognition highlights the university's commitment to maintaining high standards in education and research.

Among its broad array of academic programs, the university offers premier medical courses through the SGT Medical College, Hospital & Research Institute, which are considered among the best in the nation. These programs are seamlessly integrated with practical training and research opportunities, ensuring that students receive a comprehensive, world-class education in the medical field.

Our Vision

To nurture individual's excellence through value based, cross-cultural, integrated and holistic education adopting the contemporary and advanced means blended with ethical values to contribute in building a peaceful and sustainable global civilization.

Our Mission

- To impart higher education at par with global standards that meets the changing needs of the society
- To provide access to quality education and to improve quality of life, both at individual and community levels with advancing knowledge in all fields through innovations and ethical research.
- To actively engage with and promote growth and welfare of the surrounding community through suitable extension and outreach activities
- To develop socially responsible citizens, fostering ethical values and compassion through participation in community engagement, extension and promotion activities.
- To create competitive and coordinated environment wherein the individual develops skills and a lifelong learning attitude to excel in their endeavours.

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INTRODUCTION

In the dynamic and ever-changing global landscape, the need for lateral thinking, innovation, and entrepreneurial spirit has never been greater. Traditional educational approaches that focus solely on specific skill sets often become outdated due to the rapid pace of technological advancements. As such, no university curriculum can comprehensively address all areas of importance or relevance. To ensure that students are better equipped to meet industry demands, it is crucial for higher education institutions to supplement the core curriculum, helping students develop both their aptitudes and interests.

Objectives:

The primary objectives of the Value-Added Course (VAC) are:

1. **To enhance industry understanding:** Equip students with knowledge of industry expectations and requirements.
2. **To improve employability:** Enhance students' employability skills, making them more competitive in the job market.
3. **To bridge skill gaps:** Address existing gaps in skills and ensure students are industry ready.
4. **To foster inter-disciplinary skills:** Provide students with opportunities to develop diverse skills across various disciplines.
5. **To encourage entrepreneurship:** Inspire students to become job creators rather than just job seekers.

Course Design

Departments designing Value-Added Courses should begin by conducting a **Training Need Analysis** and engaging with industry experts, alumni, and employers to identify skill gaps and emerging trends. This will guide the creation of a syllabus tailored to current demands.

Conduction of Value-Added Courses

- **Voluntary Participation:** VAC is not a mandatory requirement for completing any academic program, and the credits earned through these courses are additional to the degree's total credit requirement.
- **Learning Format:** VAC is an instructor-supported learning course, available to all students without any additional fee. Classes are typically scheduled during reserved time slots, beyond regular class hours, and may also be conducted on weekends or during vacations.
- **Course Registration:** Students may register for only one Value-Added Course per semester, preferably offered by their own department. However, with prior permission from the Dean, they can take courses from other departments.



- **Minimum Participants:** A minimum of 5 students must opt for a course for it to be offered.
- **Industry and Expert Involvement:** Eminent industry professionals or academicians may conduct VACs. This broadens students' exposure and enhances the learning experience.

Course Duration and Structure

- **Duration:** Each Value-Added Course should last at least 30 hours, with a balanced structure of 18 hours (60%) theory and 12 hours (40%) practical. The exact division of theory and practical hours will be determined by the course instructor with the approval of the Dean.
- **Location:** The courses will be conducted within the respective schools, with classrooms assigned by the Dean based on student numbers.

REGISTRATION PROCEDURE

1. **Course Listings:** A list of available Value-Added Courses, along with syllabi, will be posted on the university website.
2. **Registration Process:** Students must complete and submit a registration form to enroll in a course. The Department Head will group students based on their choices and send them to the Dean for final approval.
3. **Attendance and Assessment Records:** The course instructor is responsible for maintaining attendance and assessment records, including details on assignments, seminars, and other activities. These records must be signed by both the course instructor and the Department Head and kept for future reference.
4. **Attendance Requirements:** Students must maintain at least 75% attendance in the Value-Added Course to be eligible for a certificate. Up to a 10% relaxation in attendance may be granted for valid reasons, such as illness or extracurricular participation.

Certification

Upon successfully completing a Value-Added Course, students will be awarded a **certificate** signed by the authorized university signatories, recognizing their accomplishment in the course.

Course Code: VAC/FEAT/001

COURSE OBJECTIVES:

- To introduce students to the concepts, tools, and techniques of project management using Critical Path Method (CPM) and Program Evaluation Review Technique (PERT).
- To enable students to plan, schedule, monitor, and control projects effectively.
- To equip students with the knowledge required to optimize resources and manage risks in projects.

COURSE OUTCOMES:

- Understand the basic principles and significance of project management.
- Apply CPM and PERT techniques for effective project planning and scheduling.
- Analyse project timelines, resource requirements, and critical paths.
- Evaluate and manage uncertainties in project schedules.
- Use project management tools to track project progress and ensure timely completion.

COURSE CONTENT:

Module I: Introduction to Project Management

- Definition and objectives of project management
- Types of projects and phases of project management
- Importance of project planning and scheduling
- Role of CPM and PERT in project management

Module II: Basics of CPM (Critical Path Method)

- Concept of network diagrams
- Identifying critical path
- Forward and backward pass calculations
- Float and its significance

Module III: Basics of PERT (Program Evaluation Review Technique)

- Difference between CPM and PERT
- Three-time estimates: optimistic, pessimistic, and most likely
- Calculating expected project duration and variance
- Probability of project completion

Module IV: Resource Allocation and Optimization

- Resource levelling and resource smoothing
- Crashing of activities and time-cost trade-offs
- Managing resource constraints and conflicts



Module V: Project Monitoring and Control

- Tracking project progress
- Earned Value Management (EVM) basics
- Risk management in project schedules
- Tools and software for project management

REFERENCES:

Textbooks:

- Rose, D. H., & Meyer, A. (2002). Teaching Every Student in the Digital Age: Universal Design for Learning.
- Tomlinson, C. A. (2014). The Differentiated Classroom: Responding to the Needs of All Learners.
- Armstrong, T. (2010). Neurodiversity: Discovering the Extraordinary Gifts of Autism, ADHD, Dyslexia, and Other Brain Differences.

Research Journals:

- Journal of Special Education
- Exceptional Children
- Learning and Individual Differences
- International Journal of Inclusive Education

Online Resources:

- CAST (Center for Applied Special Technology) - UDL Guidelines
- National Center on Universal Design for Learning
- Understood.org
- International Society for Technology in Education (ISTE)

Course Code: VAC/FEAT/002

COURSE OBJECTIVES:

- Understand Excel Fundamentals: Gain proficiency in basic Excel operations, including data entry, formatting, and basic formula usage.
- Apply Data Cleaning Techniques: Learn methods to clean, sort, and organize raw datasets for analysis.
- Utilize Advanced Functions: Master statistical, logical, and lookup functions such as VLOOKUP, HLOOKUP, and IF for data processing.
- Create and Interpret Visualizations: Develop skills to create charts, graphs, and dashboards for effective data visualization and interpretation.
- Analyse Data Using Pivot Tables: Learn to summarize and analyse data dynamically using pivot tables and pivot charts.

COURSE OUTCOMES:

- Indicate the names and functions of the Excel interface components.
- Format edit data and cells.
- Construct formulas, including the use of built-in functions, and relative and absolute references.
- Create charts and preview worksheets.

COURSE CONTENT:

Module 1: Introduction to Excel

- About Excel & Microsoft - Uses of Excel - Excel software
- Spreadsheet windowpane - Title Bar - Menu Bar - Standard Toolbar
- Formatting Toolbar - the Ribbon - File Tab and Backstage View - Formula Bar - Workbook Window

Module 2: Basics of Status Bar

- Task Pane - Workbook & sheets
- Columns & Rows: Selecting Columns & Rows
- Changing Column Width & Row Height – Auto fitting Columns & Rows
- Hiding/Unhiding Columns & Rows

Module 3: Inserting & Deleting Columns & Rows - Cell

- Address of a cell - Components of a cell – Format – value – formula - Use of paste and paste special
- Functionality Using Ranges: Using Ranges - Selecting Ranges
- Entering Information into a Range



Module 4: Using Formulas

- Formula Functions – Sum - Average, if, Count, max, min, Proper, Upper, Lower, Using AutoSum.
- Advance Formulas: Concatenate, VLOOKUP, Hookup, Match
- Countif, Text, Trim Spreadsheet Charts

Module 5: Using Charts

- Different types of charts, Formatting Chart Objects
- Changing the Chart Type
- Showing and Hiding the Legend
- Showing and Hiding the Data

REFERENCES:

- "Microsoft Excel 365 Bible" by Michael Alexander, Dick Kusleika, and John Walkenbach
- "Excel Formulas and Functions for Dummies" by Ken
- "Excel Power Pivot & Power Query for Dummies" by Michael Alexander



Desing and Drafting



SGT UNIVERSITY

Course Code: VAC/FEAT/003

COURSE OBJECTIVES:

- The students of the course should be able to –
- Identify the basic 2D drafting tools (drawing and editing) and toolbars in drafting software.
- Interpret the concept of layer, and of model space and paper space in conjunction with viewport.
- Describe the concept of blocks, attributes etc. to better organize complicated drawings.
- Prepare engineering drawing of simple machine components up to its paper printout with proper scale.
- Construct isometric drawings for simple engineering components.

COURSE OUTCOMES:

- Create both two- and three-dimensional designs/drawings using CAD software
- Cite and identify technical drafting practices, procedures, and processes according to current ANSI/ISO standards
- Demonstrate the use of traditional drafting instruments, media and equipment used in industry
- Sketch and model Multiview drawings
- Explain the need, relevancy and application of CAD to the various engineering disciplines

COURSE CONTENT:

Module I: Introduction and Orientation to Technical Drafting

- Introduction to Computer Aided Drafting and Design
- Instrument Drawing Techniques

Module II: Design Processes and Methods

- Drawing Management/File Types
- Sketching

Module 3: Orthographic Projection/Multiview Drawings

- Pictorials
- Geometric Constructions
- Dimensioning and Tolerancing

Module 4: Manufacturing Processes

- Three-dimensional Modeling

Module 5: Production Drawings

- Section Views
- Auxiliary Views



REFERENCES:

- "AutoCAD for Engineers and Designers" by Sham Tickoo
- "Mastering AutoCAD for Civil Engineering" by David J. D. Silva
- "AutoCAD for Electrical Engineers and Designers" by N. S. Jadav

