SGT UNIVERSITY

VALUE ADDED COURSES

Faculty of Applied & Basic Sciences 2024-25

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

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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.

Environment Health & Safety

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Course Code: VAC/FABS/004

COURSE OBJECTIVES:

- To introduce key workplace health hazards and safety regulations.
- To understand the impact of workplace factors on employee well-being.
- To apply safety principles and Implement safety measures to real-world scenarios.
- To analyse different hazards and safety management systems.
- To evaluate the effectiveness of safety programs.
- To develop new safety strategies and design comprehensive safety plans.

COURSE OUTCOMES:

- Identify and explain key environmental health hazards and safety regulations.
- Apply safety principles and implement effective environmental and occupational safety measures.
- Analyse different types of environmental and occupational hazards and safety management systems.
- Evaluate the effectiveness of environmental and occupational safety programs.
- Develop new environmental and occupational safety strategies and design comprehensive safety plans..

COURSE CONTENT:

Module I: Introduction to Environment health and safety(EHS)

- Introduction to Occupational Health, Industrial, and Environmental Safety, Need and Importance of Industrial and Environmental Safety, Occupational Diseases and their Effects, Working Environment: Noise, Ventilation, Lighting, Temperature, Humidity, Stress Factors and Fatigue (Meaning, Causes, Remedies)

Module II: EHS Management Principles and Practices

- Principles and Practices for Occupational Health and Environmental Safety Management , Elements of Working Conditions, Responsibilities of the Safety Department, Occupational Safety & Health Act (OSHA), 1970 (or relevant legislation)

Module III: Advanced EHS Topics

- Risk Assessment and Control Measures, Emergency Preparedness and Response, EHS Management Systems (e.g., ISO 14001, ISO 45001), Emerging EHS Issues (e.g., Nanotechnology, Climate Change)

REFERENCES:

1. Environmental Hazards and Human Health – R.B. Phillip
2. Toxicology – Principles and Applications- Niesink, John de Vries & Hollinger
3. Handbook of "Occupational Safety and Health", National Safety Council, Chicago, 1982
4. Occupational Health Hazards and Remedies. (2002). Mohapatra, R. Jaypee Brothers Medical Publishers Pvt. Ltd. India.

LaTex for Scientific & Technical Writing

SGT UNIVERSITY

Course Code: VAC/FABS/005

COURSE OBJECTIVES:

- To introduce the fundamentals of scientific writing and its role in academic and technical fields.
- To understand the structure and formatting of scientific documents, including articles, theses, and reports.
- To familiarize students with LaTeX, a typesetting tool for creating high-quality documents.
- To develop proficiency in using LaTeX for preparing professional documents with proper citations, equations, and visuals.
- To enhance the ability to design presentations and posters using LaTeX-based tools.

COURSE OUTCOMES:

- Explain the significance and principles of scientific writing and document structuring.
- Use LaTeX to create and format professional-quality documents, including reports, articles, and theses.
- Apply LaTeX tools for handling references, citations, tables, equations, and figures effectively.
- Design visually appealing presentations and posters using LaTeX packages.
- Demonstrate the ability to troubleshoot and customize LaTeX templates for diverse writing needs.

COURSE CONTENT:

Module I: Fundamentals of Scientific Writing

- Basics of scientific writing: structure, clarity, and ethics.
- Importance of typesetting in academic and technical writing.
- Introduction to LaTeX: Overview, installation, and workflow.

Module II: Document Preparation with LaTeX

- Creating documents: Basic syntax, document classes, and packages.
- Structuring documents: Sections, subsections, and formatting text.
- Handling references and citations: BibTeX and bibliography management.

Module III: Advanced Features in LaTeX

- Inserting tables, equations, and figures.
- Customizing styles: Fonts, colours, and layout adjustments.
- Creating indices, glossaries, and appendices.

Module IV: Presentation and Poster Design

- Introduction to Beamer: Creating presentations with LaTeX.
- Designing posters using LaTeX-based templates.
- Best practices for professional document presentation.

REFERENCES:

1. Leslie Lamport, LaTeX: A Document Preparation System, Addison-Wesley, 1994.
2. Gratzer, George, More Math into LaTeX, Springer, 2020.
3. Kopka, Helmut, and Patrick W. Daly, A Guide to LaTeX, Addison-Wesley, 2003.
4. Overleaf Documentation, https://www.overleaf.com/learn.
5. Mittel Bach, Frank, and Michel Goossens, The LaTeX Companion, Addison-Wesley, 2004.

Psychographic Analysis

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Course Code: VAC/FABS/006

COURSE OBJECTIVES:

- To introduce the fundamentals of psychographic analysis, including its need, scope, and forensic applications.
- To understand psychological profiling techniques and their role in forensic investigations.
- To explore different psychographic indicators and their significance in behavioural analysis.
- To analyse the relationship between personality traits and criminal behaviour using psychographic principles.
- To develop practical skills in forensic psychographic analysis through case studies and hands-on exercises.
- To understand the role of handwriting analysis in psychographic profiling and forensic investigations.

COURSE OUTCOMES:

- Explain the fundamentals of psychographic analysis and its role in forensic science.
- Identify key psychographic indicators used in personality profiling and behavioural analysis.
- Apply psychological profiling techniques to forensic case studies and criminal investigations.
- Evaluate the relationship between personality traits and criminal tendencies.
- Conduct psychographic assessments using systematic and scientific approaches.
- Analyse handwriting to infer psychological and personality traits in forensic investigations.

COURSE CONTENT:

Module I: Fundamentals of Psychographic and Handwriting Analysis

- Definition, need, and scope of psychographic analysis in forensic science, History and development of psychographic profiling, Psychological theories related to behavioral analysis, Basics of handwriting analysis and its forensic significance, Correlation between handwriting characteristics and personality traits.

Module II: Personality Profiling and Behavioural Indicators

- Key personality traits and their forensic significance, Psychographic indicators in behavioural analysis, Methods of personality profiling in forensic science, Psychological theories supporting handwriting-based psychographic profiling, Analysis of handwriting characteristics in forensic contexts.

Module III: Forensic Applications and Criminal Profiling

- Role of psychographics in criminal profiling, Application in suspect identification and risk assessment, Case studies on psychographic profiling in forensic investigations, Use of handwriting analysis in suspect profiling and forensic investigations.

Module-IV: Practical Applications and Ethical Considerations

- Hands-on exercises in psychographic assessment, Analysis of real-life forensic cases using psychographic principles, Ethical considerations and limitations of psychographic analysis in forensic science.

REFERENCES:

1. Turvey, Brent E. Criminal Profiling: An Introduction to Behavioural Evidence Analysis. Academic Press, 2011.
2. Bartol, Curt R., and Anne M. Bartol. Criminal Behaviour: A Psychological Approach. Pearson, 2019.
3. Douglas, John E., and Mark Olshaker. Mindhunter: Inside the FBI's Elite Serial Crime Unit. Scribner, 2017.
4. Canter, David. Investigative Psychology: Offender Profiling and the Analysis of Criminal Action. Wiley, 2008.
5. Reid, Stephen. Criminal Profiling: Developing an Effective Science and Practice. Springer, 2018.
6. Huber, Roy A., and Alfred M. Headrick. Handwriting Identification: Facts and Fundamentals. CRC Press, 1999.
7. Mendel, O. Alfred. Personality in Handwriting: A Handbook of American Graphology. 1947.

Green Chemistry and Sustainable Practices

SGT UNIVERSITY

Course Code: VAC/FABS/007

COURSE OBJECTIVES:

- To introduce the principles of green chemistry and their significance in sustainable development.
- To understand the design of chemical processes and products that reduce or eliminate hazardous substances.
- To explore renewable resources and eco-friendly alternatives in chemical industries.
- To emphasize the role of green chemistry in addressing environmental challenges like pollution and waste management.
- To develop skills for evaluating the sustainability of chemical processes and practices.

COURSE OUTCOMES:

- Explain the principles of green chemistry and their role in sustainable development.
- Evaluate chemical processes for their environmental impact and suggest eco-friendly alternatives.
- Design and analyse sustainable chemical processes and products.
- Apply green chemistry principles to waste management and pollution control.
- Demonstrate knowledge of renewable energy sources and materials in chemical applications.
- Advocate for sustainable practices in academic, industrial, and social contexts.

COURSE CONTENT:

Module I: Fundamentals of Green Chemistry

- Definition, scope, and significance of green chemistry.
- Twelve principles of green chemistry.
- Atom economy and its importance in chemical synthesis.
- Metrics for evaluating green processes (E-factor, carbon efficiency).

Module II: Green Synthesis and Catalysis

- Designing safer chemicals and processes.
- Use of green solvents: supercritical fluids, ionic liquids, and water.
- Catalysis: Heterogeneous and homogeneous catalysts in green chemistry.
- Energy-efficient synthetic methodologies (microwave and ultrasound-assisted synthesis).

Module III: Renewable Resources and Materials

- Utilization of biomass and renewable feedstocks.
- Bio-based polymers and biodegradable materials.
- Green energy alternatives: solar, wind, and biofuels.
- Case studies of sustainable products and processes.

Module-IV: Environmental Applications and Pollution Control

- Role of green chemistry in pollution prevention.
- Treatment and valorisation of industrial waste.
- Green analytical chemistry: Eco-friendly methods for analysis.
- Case studies: Successful green chemistry applications in industry.

REFERENCES:

1. Anastas, Paul T., and John C. Warner, Green Chemistry: Theory and Practice, Oxford University Press, 1998.
2. Matlack, Arthur S., Introduction to Green Chemistry, CRC Press, 2010.
3. Lancaster, Mike, Green Chemistry: An Introductory Text, Royal Society of Chemistry, 2016.
4. Sheldon, Roger A., Green Chemistry and Catalysis, Wiley-VCH, 2007.
5. Tundo, Pietro, et al., Green Chemistry: Metrics, Challenges, and Opportunities, Springer, 2017.