



**SHIVALIK**  
COLLEGE OF ENGINEERING

# Value Added Courses

**SESSION**  
**2020-2021**

---



# VALUE ADDED COURSES



# INDEX

<b>SNo.</b>	<b>Course Name</b>	<b>Course Code</b>	<b>Page No.</b>
01	Soft skill Grammer & Language	VACAS01	01
02	Logical reasoning	VACAS02	02
03	Soft skill- Communication Training	VACAS03	03
04	Aptitude Quant	VACAS04	04
05	Soft skill Grammar & Language	VACAS05	05
06	Aptitude-Company specific training	VACAS06	06
07	Soft skill -Personality development program	VACAS07	07
08	Universal human values	VACAS08	08
09	Professional Ethics	VACAS09	09
10	Cyber Security	VACCS03	10
11	Machine Learning	VACCS04	11
12	Autocad	VACCE01	12
13	Revit	VACCE02	13
14	Autodesk Inventor	VACME01	14
15	PLC ,SCADA and MATLAB	VACEC02	15

# 1. Soft skill Grammar & Language

**Course Code : VACAS01**

**Total Duration : 45 Hrs**

## **COURSE OBJECTIVE:**

The objective is to make students aware about the nitty-gritties of English as a language and also developing a vision about the pre-requisites of soft skills in corporate in general .

## **Course Content**

### **Chapter 1**

Introduction of Soft skills , Personality and its type  
Planning & Goal Setting

### **Chapter 2**

Body Language, Behaviour & Its Type, Grooming – men and women,  
Presentation Skills, Listening

### **Chapter 3**

Perception & Attitude, Public Speaking, Greeting, Etiquette, Thought  
Process, Introducing oneself

### **Chapter 4**

Parts of Speech, Tense, Sentence Structure

## **Reference Books:**

1. Soft Skills – Enhancing Employability: Connecting Campus with Corporate” by M S Rao
2. Personality Development and Soft Skills (Old Edition)” by Barun K Mitra

## 2.Logical reasoning

**Course Code :VACAS02**

**Total Duration : 40Hrs**

### **COURSE OBJECTIVE:**

Developing a logical bent of mind so that they can approach the things in a more analytical way as this skill is usually tested in all spheres.

### **Chapter 1**

Calendar , Odd One Out , Analogy Figure Counting ,Missing Numbers

### **Chapter 2**

Number Series, Alphabet Series, Direction Sense

### **Chapter 3**

Blood Relation, Cubes and Dices, Coding Decoding, Clocks

### **Chapter 4**

Inequality, Ranking , Test , Syllogism Venn Diagram , Sitting Arrangement

### **Chapter 5**

Input Output Data, Arrangement, Cryptoarithmic,Visual Reasoning Decision Making ,Game Based Aptitude

### **Reference Books:**

- 1.A Modern Approach To Verbal & Non-Verbal Reasoning by R.S. Aggarwal
- 2.A New Approach to Reasoning Verbal & Non-Verbal Book by B.S. Sijwalii and Indu Sijwali

## **3. Soft skill- Communication Training**

**Course Code :VACAS03**

**Total Duration : 45Hrs**

### **COURSE OBJECTIVE:**

Going one step ahead in developing grammatical skills so that students can appreciate the importance of communication as a stream.

### **Chapter 1**

Public Speaking, Ethics and Values, Body Language, Positive Attitude

### **Chapter 2**

Intrapersonal & Interpersonal Skills, Decision Making, Picture Perception, Communication (Verbal, Written, Business), Team Work

### **Chapter 3**

Gerunds, Infinitives, Modals, Conjunction, Participles, Quantifiers, Preposition

### **Chapter 4**

Emotional Intelligence Skills, Life Skills, Presentation on Soft Skills

### **Reference Books:**

1. Soft Skills 3rd Edition: Personality Development for Life Success  
by Prashant Sharma
2. Personality Development Handbook Paperback – 25 January 2021  
by D. P. Sabharwal

## 4. Aptitude Quant

**Course Code :VACAS04**

**Total Duration : 30Hrs**

### **COURSE OBJECTIVE:**

Developing skills like quick mathematical decision making as students are expected to solve questions in a very limited time span in actual placements.

### **Chapter 1**

Average, Time and Work(Time and Work+Chain Rule+Pipes and Cisterns), Percentage, Profit and Loss, Ratio and Proportion, Partnership

### **Chapter 2**

Mixture and Alligation, Time Speed and Distance(TSD+Problemson Trains+Races and Games+Boats ans Streams), Simple Interest, Compound Interest

### **Chapter 3**

Algebra(Problems on Ages, AP GP, Sum(natural numbers,square,cube cube,even,odd), Linear Equation, Quadratic Equation), Permutation and Combination

### **Chapter 4**

Divisibility Test, Cyclicity and Remainders, HCF and LCM, Surds and Indices, Set Theory, DI

### **Chapter 5**

Elementry Stats,(Mean/Median/Mode), Trigonometry(Height and Distance), Mensuration, Geometry, Data Sufficiency

### **Reference Books:**

- 1.Quantitative Aptitude for Competitive Examinations by R S Aggarwal
- 2.Quantitative Aptitude for CAT by Arun Shrama

## **5.Soft skill Grammar & Language**

**Course Code :VACAS05**

**Total Duration : 30Hrs**

### **COURSE OBJECTIVE:**

To hone the critical aspect of things and also develop their presentation ability so that they understand the essence of spontaneity and organized structured way to present their thoughts

### **Chapter 1**

Writing Ability , Email Writing & Etiquette, Extempore, PI Theory

### **Chapter 2**

Group Discussion , Resume Writing , Corporate Expectations ,  
Careers After UG, (With special ref. to modern world) , Work Culture

### **Chapter 3**

Critical Reasoning : Strengthen, Critical Reasoning : Weaken, Critical Reasoning : Paradox, Critical Reasoning : Inference

### **Chapter 4**

Reading Comprehension, Para Jumble, Cloze Test

### **References Books:**

- 1.Soft Skills – Enhancing Employability: Connecting Campus with Corporate” by M S Rao
- 2.Personality Development and Soft Skills (Old Edition)” by Barun K Mitra



## 6. Aptitude-Company specific training

**Course Code :VACAS06**

**Total Duration : 30Hrs**

### **COURSE OBJECTIVE:**

A recap of whatever we studied in the preceding semesters in Quant and Reasoning as per the requirement of companies

- Capsule Course Revision Of Entire Syllabus
- Company Specific Test

### **Chapter 1**

Number System, LCM & HCF, Numbers & Decimal Fractions, Divisibility, Area, Shapes & Perimeter, Geometry, Averages, Equations, Ages,

### **Chapter 2**

Probability, Percentages , Allegations and Mixtures, Ratios, Proportion, Work and Time, Speed Time and Distance

### **Chapter 3**

Calendar , Odd One Out , Analogy Figure Counting ,Missing Numbers ,Number Series, Alphabet Series, Direction Sense

### **Reference books:**

1. Quantitative Aptitude for Competitive Examinations by R S Aggarwal
2. A Modern Approach To Verbal & Non-Verbal Reasoning by R.S. Aggarwal

# 7. Soft skill –Personality development program

**Course Code :VACAS07**

**Total Duration : 30Hrs**

## **COURSE OBJECTIVE:**

A recap of whatever we studied in the preceding semesters in Verbal and Soft Skills as per the requirement of companies.

- Capsule Course Revision Of Entire Syllabus
- Company Specific Test

**Chapter 1 Body Language:** Gestures; Facial Expressions; Importance of Eye Contact, Body Movement,

**Chapter 2 Role of Formal Attire,** Introduction to Grammar, Focus of Reading & Listening; Parts of Speech; Tense; Conjunction; Phrasal Verbs; Idioms,

**Chapter3 Group Discussions:** Tips for Success in GD's; How to Start, Lead and Conclude A GD; Types of GD; Do's & Don'ts and Mistakes to Avoid during a GD,

## **Chapter 4 Communication Skills:**

Verbal Communication; Written Communication; Non Verbal Communication; Role of Communication in Business & Relationships; Barriers to Effective Communication,

## **Reference books:**

1. Soft Skills 3rd Edition: Personality Development for Life Success by Prashant Sharma
2. Personality Development Handbook by D. P. Sabharwal

# 8. HUMAN VALUES

**Course Code :VACAS08**

**Total Duration: 35Hrs**

## **COURSE OBJECTIVE:**

To develop the ability to distinguish between what is of value and what is superficial in life. • To develop the ability to face difficult situations in life boldly and resolve them confidently. • To enable students to progress from discrimination to commitment.

### **Chapter 1: Introduction to Value Education**

- Introduction to Kotlin Programming Language
- Classes and Objects in Kotlin
- Functions and Lambdas in Kotlin
- Advanced Concepts in Kotlin

### **Chapter 2: Harmony in the Human Being**

- Human Being is more than just the Body.
- Harmony of the Self ('I') with the Body.
- Understanding Myself as Co-existence of the Self and the Body.
- Understanding Needs of the Self and the needs of the Body.
- Understanding the activities in the Self and the activities in the Body

### **Chapter 3: Harmony in the Family and Society and Harmony in the Nature**

- Comprehensive Human Goal: The Five Dimensions of Human Endeavour.
- Harmony in Nature: The Four Orders in Nature.
- The Holistic Perception of Harmony in Existence.

### **Chapter 4: Social Ethics**

- The Basics for Ethical Human Conduct.
- Defects in Ethical Human Conduct.
- Holistic Alternative and Universal Order.
- Universal Human Order and Ethical Conduct.

## **REFERENCE BOOKS:**

1. Corliss Lamont, Philosophy of Humanism
2. Gaur. R.R. , Sangal. R, Bagaria. G.P, A Foundation Course in Value Education, Excel Books, 2009.

# 9. PROFESSIONAL ETHICS

**Course Code :VACAS09**

**Total Duration: 35Hrs**

## **COURSE OBJECTIVE:**

- To create awareness on professional ethics and Human Values.
- To provide basic familiarity about Engineers as responsible Experimenters, Research Ethics, Codes of Ethics, Industrial Standards.
- To inculcate knowledge and exposure on Safety and Risk.
- To expose students to right attitudinal and behavioural aspects

## **Chapter 1: Introduction to Value Education**

Morals, values and Ethics, Integrity, Work ethic, Civic virtue , Valuing time, Cooperation, Commitment, Empathy, Selfconfidence , stress management, Senses of Engineering Ethics, Kohlberg`s theory, Gilligan`s theory, Models of professional roles, Uses of Ethical Theories.

## **Chapter 2: Research Ethics and Codes of Ethics:**

Industrial standardization, ethical code and its importance, ethical accountability, law in engineering, engineering as social experimentation.

## **Chapter 3: Safety, Responsibilities and Rights:**

Safety and Risk, Assessment of Safety and Risk, Risk Benefit Analysis and Reducing Risk collegiality, Collective Bargaining , Confidentiality , Conflicts of Interest, Professional Rights, Employee Rights, Intellectual Property Rights (IPR), Discrimination, Utilitarianism

## **Chapter 4: Professional Etiquette:**

Etiquette at Meetings, Public Relations Office(PRO)`s Etiquettes, Technology Etiquette Phone Etiquette, Email Etiquette, Social Media Etiquette, Video Conferencing Etiquette, Interview Etiquette, Dressing Etiquettes : for Interview, offices and social functions, Ethical Values: Importance of Work Ethics.

## **REFERENCE BOOKS:**

1. Professional Ethics: Need for the 21st Century Book by R. Subramanian
2. PROFESSIONAL ETHICS AND HUMAN VALUES by S. Dinesh Babu

# 10. CYBER SECURITY

**Course Code :VACCS03**  
**30Hrs**

**Total Duration :**

## **COURSE OBJECTIVE :**

This course focuses on the models, tools, and techniques for enforcement of security with some emphasis on the use of cryptography and also on analyzing and resolving security issues in networks and computer systems to secure an IT infrastructure.

### **UNIT I: Introduction to Cyber security & Ethical Hacking**

Need of Cybersecurity, CIA Triad, Security Architecture, Security Governance, Security Auditing, Regulations & Frameworks, Ethical Hacking, Types of Hackers ,Phases of Ethical Hacking

### **UNIT II: Cryptography**

Types of cryptography, Symmetric cryptography, Asymmetric cryptography, Hash functions, Digital signatures, Public Key Infrastructure (PKI), Attacks on cryptosystems

### **UNIT III: Computer Networks & Security**

Introduction to Computer Network, Computer Networks – Architecture, Layered architecture, Open Systems Interconnect (OSI) Model, Transmission Control Protocol/Internet Protocol (TCP/IP), Network

### **UNIT IV: Application and Web Security**

Web server architecture, Web server attacks, Countermeasures and patch management, Web application architecture, Web application attacks

### **UNIT V: IdAM (Identity and Access Management)**

Authentication and authorization, Authentication and authorization principles, Regulation of access, Access administration, IdAM,

### **References:**

- Social Engineering: The Science of Human Hacking Paperback by Christopher Hadnagy
- Hacking: The Art of Exploitation, 2nd Edition by Jon Erickson

# 11. Machine Learning

**Course Code :VACCS04**

**Total Duration : 35Hrs**

## **COURSE OBJECTIVE:**

The main objective of this course is to enabling the student with basic knowledge on the techniques to build an intellectual machine for making decisions behalf of humans. This course covers the techniques on how to make learning by a model, how it can be evaluated, what are all different algorithms to construct a learning model.

## **UNIT I:**

1. Introduction to machine learning
2. Linear prediction: Regression
3. Maximum likelihood
4. Regularizers, cross-validation, learning curves

## **UNIT II:**

1. Optimisation
2. Classification: Linear classification, logistic regression
3. Classification: Support vector machines
4. Kernels

## **UNIT III:**

1. Feed-forward neural networks
2. Backpropagation
3. Convolutional neural networks
4. Unsupervised learning: Clustering

## **UNIT IV:**

1. Probabilistic modelling: EM Algorithm
2. Principal component analysis
3. Recommendation systems, collaborative filtering
4. Reinforcement learning

## **References:**

1. Richard O. Duda, Peter E. Hart, David G. Stork, "Pattern Classification, Wiley, 2nd Edition".
2. Christopher Bishop, "Pattern Recognition and Machine Learning, illustrated Edition, Springer, 2006

# 12. AUTO CAD

**Course Code :VACCE01**

**Total Duration : 32Hrs**

## **COURSE OBJECTIVE :**

The AutoCAD Civil 3D software permits the rapid development of alternatives through its model-based design tools techniques enabling you to organize project data, work with points, create and analyze surfaces, model road corridors, create parcel layouts, perform grading and volume calculation tasks, and layout pipe networks.

### **Chapter 1: Basic Drawing Skills**

- Navigating 2D Drawings
- Drawing Lines and Rectangles
- Cancelling, erasing, Undoing
- Drawing Circles, Arcs, Polygons
- Filletting and Chamfering Lines

### **Chapter 2: Editing Entities**

- Move and Copy
- Rotate and Scale
- Arrays, Grip Editing
- Trim and Extend
- Offset and Mirror

### **Chapter 3: Controlling Object Visibility**

- Changing Object Properties
- Setting the Current Layer
- Altering Objects' Layer Assignments
- Assigning Properties by Object or by Layer
- Managing Layer Properties

### **Chapter 4: Hatching and Gradients**

- Specifying Hatch Areas
- Associating Hatches with Boundaries
- Hatching the Patterns
- Hatching the Gradients

### **References:**

- I. AutoCAD 2022: A Power Guide for Beginners and Intermediate
- II. AutoCAD 2022 for the Interior Designer: AutoCAD for Mac

# 13. REVIT

**Course Code :VACCE02**

**Total Duration : 35Hrs**

## **COURSE OBJECTIVE :**

This course aims to make the participants productive by giving them the ability to produce drawings and redefine images of buildings. Also, it will help you navigate user interface, architectural objects such as floor, walls, roofs, windows, and stairs. Covering the basics of Revit Architecture, This course will assist in the creation of schematic design through construction documentation.

## **Chapter 1: Introduction to BIM and Autodesk Revit**

- BIM and Autodesk Revit
- Overview of the Interface
- Starting Projects
- Viewing Commands

## **Chapter 2: Basic Drawing and Modify Tools**

- Using General Drawing Tools
- Editing Elements
- Working with Basic Modify Tools
- Working with Additional Modify Tools

## **Chapter 3 : Working with Doors and Windows**

- Inserting Doors and Windows
- Loading Door and Window Types from the Library
- Creating Additional Door and Window Sizes

## **Chapter 4: Modeling Stairs, Railings, and Ramps**

- Creating Component Stairs
- Modifying Component Stairs
- Working with Railings
- Sketching Custom Stairs
- Creating Ramps

## **REFERENCE BOOKS:**

- I. Autodesk Revit 2020 Architectural Command
- II. Building information modelling (Global & Indian perspect



# 14. AUTODESK INVENTOR

**Course Code :VACME01**

**Total Duration : 30Hrs**

## **COURSE OBJECTIVE :**

This course will cover principles of 3D parametric part design, assembly design and creating production-ready part, assembly drawings and analysis using Autodesk Inventor. After completing this course students will be able to Create multiple designs using several of tools.,

### **Chapter 1: Getting Started**

Autodesk Inventor User Interface, Designing Parametric Parts , Using Project Files for Part Design , Creating 2D & Basic Sketches , Geometric Constraints

### **Chapter 2: Intermediate Sketching**

Editing Parametric Parts ,Creating Work Features , Modify ,Creating Basic Swept Shapes , Creating Chamfers and Fillets , Creating Holes and Threads , Patterning and Mirroring Features

### **Chapter 3: Assembly**

Creating Thin-Walled Parts , Designing Assemblies , Using Project Files for Assembly Design , Constraining Components , Basic Part Design in an Assembly , Identifying Parts in an Assembly

### **Chapter 4: Drawing Creation Environment**

Creating Chamfers and Fillets , Base and Projected Views , Section Views , Detail Views , Managing Views , Automated Dimensioning Techniques , Manual Dimensioning Techniques , Annotating Holes and Threads , Creating Centrelines, Symbols and Leaders , Creating Tables ,

### **Chapter 5: Analysis**

Stress Analysis Overview , Dynamic Simulation Overview , Preparing and Running a Simulation ,Viewing Results ,Analyzing Assemblies Performing , Convergence Performing a Model Analysis , Preparing and Running a Simulation , Viewing Results , Analyzing Assemblies ,

### **References:**

- Autodesk Inventor Professional 2021, by Prof. Sham Tickoo
- Learning Autodesk Inventor 2021 Paperback by Randy Shih

# 15. PLC – SCADA & MATLAB

**Course Code :VACEC02**

**Total Duration: 32Hrs**

## **COURSE OBJECTIVE:**

The main objectives of the program are:

To understand the generic architecture and constituent components of a Programmable Logic Controller. To apply knowledge gained about PLCs and SCADA systems to real-life industrial applications. To develop a software program using modern engineering tools and technique for PLC and SCADA. To provide students an understanding of the expectations of industry.

### **Chapter 1:**

Concept of Automation, Need & history of automation, Basics of PLC Introduction to PLC, pin diagrams, Block diagram of PLC, Detailed information of PLC

### **Chapter 2:**

Internet of Things (IOT), Programming by using Allen Bradley PLC & Micro Logix, RS Logix software.

Troubleshooting & fault diagnostics of PLC

### **Chapter 3:**

SCADA wonder ware InTouch, creating new SCADA applications, creating database of tags, creating & editing graphic display with automation.

### **Chapter 4:**

The MATLAB user interface ,Working with MATLAB data types,Creating matrices and arrays ,Operators and control statements ,Using scripts and functions ,Data import and export ,Using the graphical features

## **REFERENCE BOOKS:**

- PLC & SCADA SYSTEMS by Francis G.L
- Duane Hansel man, Bruce Little Field “Mastering MATLAB 7” Pearson Education India