INDEX

(SESSION: - 2021-22)

Syllabus covered

S.NO	Name of VACs	Department
1	CAD	CE
2	REVIT/STADD PRO	CE
3	ETABS2016/AUTOCAD Basic/MSP Basic	CE
4	ADVANCE EXCEL	EC/ME/MBA
5	IoT	ECE
6	PCB DESIGNING	ECE
7	AUTO CAD	ME

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CAD TRAINING SYLLABUS

ADD ON COURSE FOR B.TECH (CE)-III SEM

SESSION 2021-22

SYLLABUS & FEATURES

CAD is a software application that is used to create drafting solutions.

It may be used to develop blueprints for bridges, buildings, and computer chips, among other things.

For drafting. it provides 2D and 3D application features. CAD is commercial software that was initially designed as a desktop application

CAD creates designs: generate model drafts or blueprints in 3D on a computer using the CAD software.

The predominant topics covered in the program includes Analysis of Space Frames, Sketch Entities and Sketch Tools, Geometry and Dimensional Constraints, Interactive Design, and Smart Dimensions..

Features of CAD:

3D Presentations. Visualizing your layouts can be challenging especially if you're forced to look at it on a flat surface.

Smart tools. Smart or automated tools are one of the general features of CAD software.

Preset models.

Collaboration tools.

Simulation tools.

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CAD TRAINING SYLLABUS

ADD ON COURSE FOR B.TECH (CE)-III SEM

SESSION 2021-22

TOPIC 1	CONTENT	INDEX
	Introduction	1 HRS
	Intro	
	User Interface	
	Command Description	
	Use of Mouse	
	Use of keyboard	
	Various Features	
	Civil vs Mechnical	
	Use in Industry	
	LAB	1 HR
Topic 2	**Fundamentals1 HRS**	
	Line	
	Co-ordinate System	
	Absolute	
	Relative Rectangular	
	Relative Polar	
	Pick point Method	
	Zoom & Erase	
	LAB	1 HRS
Topic 3	**Understanding Circle**	1 HRS
	Line	
	Co-ordinate System	
	Absolute	
	Relative Rectangular	
	Relative Polar	
	Pick point Method	
	Zoom & Erase	
	LAB	1 HRS

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Topic 4	**Introduction to Product Design Cycle**	1 HRS
	LAB	1 HRS
Topic 5	Views, Camera, Walk-through, Render & Solar Study	1 HRS
	LAB	1 HRS
Topic 6	**Types of Lines & Circle**	1 HRS
	LAB	1 HRS
Topic 7	Types of Polygons & Rectangle	1 HRS
	LAB	1 HRS
Topic 8	**Draw Tools**	1 HRS
	LAB	1 HRS
Topic 9	Drafting Setting & Option	1 HRS
	LAB	1 HRS
Topic 10	**Dimension & Styles Setting**	1 HRS
	LAB	1 HRS
Topic 11	Modify Tools	1 HRS
	LAB	1 HRS
Topic 12	**Text & Layer Formatting**	1 HRS
	LAB	1 HRS
Topic 13	**Blocks & Design Libraries**	1 HRS
	LAB	1 HRS
Topic 14	Dynamic Block & W Block	1 HRS
	LAB	1 HRS

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Topic 15	Layout & Page Setup	1 HRS
	LAB	1 HRS
Topic 16	Plotting Tools	1 HRS
	LAB	1 HRS
Topic 17	Parametric Tools	1 HRS
	LAB	1 HRS
Topic 18	Types of Projection & Elevation, Sectional Views	1 HRS
	LAB	1 HRS
Topic 19	Introduction to 3D TOOLS - Extrudes, Revolve, Sweep, Loft	1 HRS
	Solid Editing Tools, Advanced 3D Modelling Tools, Rendering Tools, Animation Tools	
	LAB	1 HRS
Topic 20	LIVE PROJECT	3 HRS

Theory Hours	Lab Hours	Total
18 hours	22 Hours	40Hours

Mr. Anirudh Kumar
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REVIT/STADDPRO TRAINING SYLLABUS
ADD ON COURSE FOR B.TECH (CE)-V SEM
SESSION 2021-22
SYLLABUS & FEATURES

This course is focused on the building design space and will help students capture ideas; communicate designs to various stakeholders, 3D Modeling, Building Information Modeling and Project Planning Management. This is possible by the inclusion of advanced tools.

Objective:

This course provides the participants a combination of software tools to manage the entire lifecycle of building projects. As building projects also includes project management these concepts and tools are covered as well.

Revit is built for Building modeling information. Revit software includes features for building architectural design, MEP and structural engineering, and construction. STAAD stands for Structural Analysis and Designing.

Revit design **allows designers to develop and execute complex work on time while also providing realistic, high-quality 3D visuals to the client**. Revit modeling services, which include Revit 3D models, Revit drafting, and Revit design, allow for a clear representation of the genuine architectural structure.

Revit is used **to coordinate all data inputs (including CAD) and produce federated project deliverables**. Both programs are often used within the same firm, with BIM and CAD specialists working on different elements of a project.

Features:

Interoperability improvements. Connect form making to documentation with improved Revit interoperability for tools like Rhino and FormIt Pro.

Shared parameters in key schedules.

Improved rebar modelling, detailing.

Tapered walls.

Native PDF export.

Improved documentation efficiency.

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REVIT TRAINING SYLLABUS
ADD ON COURSE FOR B.TECH (CE)-V SEM
SESSION 2021-22

TOPIC		CONTENT	INDEX
Topic 1		Introduction to BIM & Revit Architecture	1 HRS
	Lab		1 HRS
Topic 2		Structural Element	1 HRS
	Lab		1 HRS
Topic 3		Place and modify Walls & Complex Walls	1 HRS
	Lab		1 HRS
Topic 4		Sheets and Title Blocks	1 HRS
	Lab		1 HRS
Topic 5		Views, Camera, Walk-through, Render & Solar Study	1 HRS
	Lab		1 HRS
Topic 6		In-Place Families	1 HRS
	Lab		1 HRS
Topic 7		Place Doors, Windows & Components	1 HRS
	Lab		1 HRS
Topic 8		Family Creation	1 HRS
	Lab		1 HRS
Topic 9		Site Design	1 HRS
	Lab		1 HRS
Topic 10		Dimensions and Constraints	1 HRS
	Lab		1 HRS
Topic 11		**LIVE PROJECT** (LAB)	3 HRS

STADD TRAINING SYLLABUS
ADD ON COURSE FOR B.TECH (CE)-V SEM
SESSION 2021-22

Topic 1	**Introduction to Structural Engineering**	2 HRS
	Introduction to STAAD.Pro V8i	
	Model Generation and Editing	
	Assigning loads	
	Automatic load generations:	
	Lab	1 HRS
Topic 2	**Slab, Wind and Moving loads**	1 HRS
	Creating Load Combinations	
	Concrete Design	
	Lab	1 HRS
Topic 3	**Column and Beam design**	1 HRS
	Seismology	
	Seismic Analysis and Design	
	Dynamic Analysis	
	Response Spectrum	
	Time History Analysis	
	Lab	1 HRS
Topic 4	FEM / FEA	1 HRS
	Introduction	
	Water Tank Design	
	Slab Design	
	Staircase Design	

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	Shear wall Design	
	Bridge Deck design using STAAD.Beava	
	Lab	1 HRS
Topic 5	Steel Design	1 HRS
	Introduction	
	Steel Frame Structure Design	
	Overhead Transmission Line Towers Design.	
	Steel Structure design with Pushover Analysis	
	Lab	1 HRS
Topic 6	Foundation Designs	1 HRS
	Isolate, Combined, Strip, Mat and Pile Cap	
	Report Generation and Plotting	
	Lab	1 HRS
Topic 7	**LIVE PROJECT (LAB)**	3 HRS

Theory Hours	Lab Hours	Total
17 hours	23 Hours	40Hours

Dharmendra Kumar

Mr. Dharmendra Kumar
Program Coordinator

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R D ENGINEERING COLLEGE, GHAZIABAD
ETABS/AUTOCAD/MSP TRAINING SYLLABUS
ADD ON COURSE FOR B.TECH (CE)-V SEM
SESSION 2021-22
SYLLABUS & FEATURES

This ETABS provides like intuitive and integrated features make applications of any complexity practical to implement. Interoperability with a series a design and documentation platform makes ETABS a coordinated and productive tool for design which range from simple 2D frames to elaborate modern high rises. Although quick and easy for simple structure, ETABS can also handle the largest and most complex building models, including a wide range of geometrical nonlinear behaviours.

FEATURES OF ETABS COURSE:

» ETABS offers a single user interface to perform: Modelling, Analysis, Design, Detailing and Reporting.
» A model explorer is available for quick access to objects properties and forms.
» Direct graphics with hardware accelerated graphics allow for navigation of models with flythrough and fast rotation.
» ETABS has wide selection of templates for quickly starting anew model.
» Plan views and elevation views are automatically generated at every grid line.
» Many drawing and drafting utilities are built into ETABS to enhance the engineers modelling experience.
» ETABS data can be viewed and edited using onscreen dock able tables.
» Engineers have many options when it comes to mesh generation.
» ETABS has built in library of standard concrete, Steel, and composite sections of both US and International standard sections.
» Shell elements are used to model wall, floor and ramps.
» Link elements are available for users to accurately represent the behavior of the structure.
» Users can create and apply hinge properties to perform pushover analysis.
» Nonlinear behavior can be modelled for frame elements using fiber hinges.
» Rigid, semi rigid and flexible floor diaphragms can be created.
» ETABS will automatically generate and apply seismic and wind loads based on various international codes.
» Its dynamic analysis capabilities include calculation of vibration modes using Ritz or Eigen vectors, response spectrum analysis and time history analysis for both linear and non-linear behavior.
» Incremental construction sequences modelling and loading can be modelled in ETABS/ Fully integrated steel connection design including members sizing is also available.
» Rendered views can be used to create images to include in client reports.
» ETABS has multiple lighting option shadows and texture options to create images of your structure.
» ETABS has complete drawing generation capabilities.
» The report generation features include an indexed table of contents, models definition information and analysis and design results in a tabulated format.
» Reports are viewable within ETABS with live document navigation connected to the model explorer and directly exportable to MS word.

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ETABS Classes can handle the following types of system and analyses easily:

»Multi story commercial, government and health care facilities.
»Parking garages with circular and linear ramps.
»Staggered truss building.
»Building with steel, concrete, composite or joist floor farming.
»Building based on multiple/ rectangular or cylindrical grid system.
»Flat and waffle slab concrete building.
»P-Delta analysis with static or dynamic analysis
»Foundation / supports settlement.
»Non-linear static pushover.
»Building with base Isolators and Dampers.

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ETABS/AUTOCAD/MSP TRAINING SYLLABUS
ADD ON COURSE FOR B.TECH (CE)-VII SEM
SESSION 2021-22

Topic 1		Modeling of Building Structure	1 Hrs
	Lab		2 Hrs
Topic 2		Object Editing tools	1 Hrs
	Lab		2 Hrs
Topic 3		Property specification	2 Hrs
	Lab		2 Hrs
Topic 4		Loads & load combination	2 Hrs
	Lab		2 Hrs
Topic 5		Analysis of Building System	3 Hrs
	Lab		4 Hrs
Topic 6		Concrete Frame Design	2 Hrs
	Lab		3 Hrs
Topic 7		Shear Wall Design	2 Hrs
	Lab		3 Hrs
Topic 8		Steel Frame Design	2 Hrs
	Lab		3 Hrs
Topic 9		Steel connection & Joist Design	2 Hrs
	Lab		2 Hrs

Theory Hours	Lab Hours	Total
17 hours	23 Hours	40Hours

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Syllabus- Add On Course for B.Tech ECE – VII Sem

Advanced Excel

Session 2021-22

This Advanced Microsoft Excel Course Syllabus is designed after the consultation with Industry Experts. This Advanced Excel Course Syllabus covers in-depth knowledge of pivot tables, audit and analyze worksheet data, VBA Macro, utilize data tools, collaborate with others, and create and manage macros with live Projects.

This advanced Excel course syllabus is designed for the intermediate Excel user who desires to learn more advanced skills. Learn the most advanced formulas, functions, charts and types of financial analysis to be an Excel power user.

Topic 1 Excel Introduction, Customizing Excel and using basic functions — **1 Hrs**

- An overview of the screen, navigation and basic spreadsheet concepts
- Various selection techniques
- Shortcut Keys
- Customizing the Ribbon • Using and Customizing AutoCorrect
- Changing Excel's Default Options
- Using Functions – Sum, Average, Max,Min, Count, Counta
- Absolute, Mixed and Relative Referencing

Topic 2 Formatting and Proofing — **1 Hrs**

- Currency Format, Format Painter
- Formatting Dates
- Custom and Special Formats
- Formatting Cells with Number formats, Font formats, Alignment, Borders
- Basic conditional formatting

Hands on Practice — **2 Hrs**

Topic 3 Mathematical Functions and Protecting Excel — **1 Hrs**

- SumIf, SumIfs CountIf, CountIfs AverageIf, AverageIfs, Nested IF, IFERROR Statement, AND, OR, NOT
- File Level Protection
- Workbook, Worksheet Protection

Topic 4 Text Functions and Date and Time Functions — **1 Hrs**

- Upper, Lower, Proper
- Left, Mid, Right
- Trim, Len, Exact
- Concatenate
- Find, Substitute
- Today, Now
- Day, Month, Year
- Date, Date if, DateAdd
- EOMonth, Weekday

Hands on Practice — **2 Hrs**

Topic 5 Advanced Paste Special Techniques in Excel 2013 / 2016 & 365 — **3 Hrs**

- Paste Formulas, Paste Formats
- Paste Validations
- Transpose Tables
- New Charts – Tree map & Waterfall
- Sunburst, Box and whisker Charts
- Combo Charts – Secondary Axis

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Dr.

- Adding Slicers Tool in Pivot & Tables
- Using Power Map and Power View
- Forecast Sheet
- Sparklines -Line, Column & Win/ Loss
- Using 3-D Map
- New Controls in Pivot Table – Field, Items and Sets
- Various Time Lines in Pivot Table
- Auto complete a data range and list
- Quick Analysis Tool
- Smart Lookup and manage Store Sorting and Filtering
- Filtering on Text, Numbers & Colors
- Sorting Options
- Advanced Filters on 15-20 different criteria(s) Printing Workbooks
- Setting Up Print Area
- Customizing Headers & Footers
- Designing the structure of a template
- Print Titles –Repeat Rows / Columns

Topic 6 Hands on Practice — **3 Hrs**

Advance Excel What If Analysis — **2 Hrs**

- Goal Seek
- Scenario Analysis
- Data Tables (PMT Function)
- Solver Tool

Topic 7 Logical Functions — **2 Hrs**

- If Function
- How to Fix Errors – if error
- Nested If
- Complex if and or functions

Topic 8 Hands on Practice — **2 Hrs**

Data Validation — **1 Hrs**

- Number, Date & Time Validation
- Text and List Validation
- Custom validations based on formula for a cell
- Dynamic Dropdown List Creation using Data Validation – Dependency List

Topic 9 Lookup Functions — **1 Hrs**

- Vlookup / HLookup
- Index and Match
- Creating Smooth User Interface Using Lookup
- Nested VLookup
- Reverse Lookup using Choose Function
- Worksheet linking using Indirect
- Vlookup with Helper Column

Topic 10 Hands on Practice — **2 Hrs**

Pivot Tables — **2 Hrs**

- Creating Simple Pivot Tables
- Basic and Advanced Value Field Setting
- Classic Pivot table
- Choosing Field
- Filtering PivotTables
- Modifying PivotTable Data
- Grouping based on numbers and Dates
- Calculated Field & Calculated Items
- Arrays Functions
- What are the Array Formulas, Use of the Array Formulas?
- Basic Examples of Arrays (Using ctrl+shift+enter).
- Array with if, len and mid functions formulas.
- Advanced Use of formulas with Array.

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	Hands on Practice	
Topic 11	Charts and slicers and Excel Dashboard	**3 Hrs**
	• Various Charts i.e. Bar Charts / Pie Charts / Line Charts	**2 Hrs**
	• Using SLICERS, Filter data with Slicers	
	• Manage Primary and Secondary Axis	
	• Adding Tables and Charts to Dashboard	
	• Adding Dynamic Contents to Dashboard	
	Hands on Practice	
Topic 12	VBA Macro	**2 Hrs**
	Introduction to VBA	**3 Hrs**
	• What Is VBA? What Can You Do with VBA?	
	• Recording a Macro	
	• Procedure and functions in VBA	
	Variables in VBA	
	• What is Variables?	
	• Using Non-Declared Variables	
	• Variable Data Types	
	• Using Const variables	
	Message Box and Input box Functions	
	• Customizing Msgboxes and Input box	
	• Reading Cell Values into Messages	
	• Various Button Groups in VBA	
	If and select statements	
	• Simple If, Elseif Statements	
	• Defining select case statements	
	Looping in VBA	
	• Introduction to Loops and its Types	
	• The Basic Do and For Loop	
	• Exiting from a Loop	
	• Advanced Loop Examples	
	Mail Functions – VBA	
	• Using Outlook Namespace	
	• Outlook Configurations, MAPI	
	• Worksheet / Workbook Operations	
	• Merge Worksheets using Macro	
	• Merge multiple excel files into one sheet	
	• Split worksheets using VBA filters	
	• Worksheet copiers	
	Hands on Practice	**4 Hrs**

Therory Hours	Lab Hours	Total
20 hours	20 Hours	40 Hours

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Syllabus- Add On Course for B.Tech ME VII Sem

Advanced Excel

Session 2021-22

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Topic 2 Formatting and Proofing — **1 Hrs**

- Currency Format, Format Painter
- Formatting Dates
- Custom and Special Formats
- Formatting Cells with Number formats, Font formats, Alignment, Borders
- Basic conditional formatting

Hands on Practice — **2 Hrs**

Topic 3 Mathematical Functions and Protecting Excel — **1 Hrs**

- SumIf, SumIfs CountIf, CountIfs AverageIf, AverageIfs, Nested IF, IFERROR Statement, AND, OR, NOT
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- Workbook, Worksheet Protection

Topic 4 Text Functions and Date and Time Functions — **1 Hrs**

- Upper, Lower, Proper
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- Trim, Len, Exact
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- Find, Substitute
- Today, Now
- Day, Month, Year
- Date, Date if, DateAdd
- EOMonth, Weekday

Hands on Practice — **2 Hrs**

Topic 5 Advanced Paste Special Techniques in Excel 2013 / 2016 & 365 — **3 Hrs**

- Paste Formulas, Paste Formats
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- New Charts – Tree map & Waterfall
- Sunburst, Box and whisker Charts

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- Combo Charts – Secondary Axis
- Adding Slicers Tool in Pivot & Tables
- Using Power Map and Power View
- Forecast Sheet
- Sparklines -Line, Column & Win/ Loss
- Using 3-D Map
- New Controls in Pivot Table – Field, Items and Sets
- Various Time Lines in Pivot Table
- Auto complete a data range and list
- Quick Analysis Tool
- Smart Lookup and manage Store Sorting and Filtering
- Filtering on Text, Numbers & Colors
- Sorting Options
- Advanced Filters on 15-20 different criteria(s) Printing Workbooks
- Setting Up Print Area
- Customizing Headers & Footers
- Designing the structure of a template
- Print Titles –Repeat Rows / Columns

3 Hrs

Hands on Practice_____ **2 Hrs**

Topic 6 Advance Excel What If Analysis

- Goal Seek
- Scenario Analysis
- Data Tables (PMT Function)
- Solver Tool

2 Hrs

Topic 7 Logical Functions

- If Function
- How to Fix Errors – if error
- Nested If
- Complex if and or functions

2 Hrs

Hands on Practice_____ **1 Hrs**

Topic 8 Data Validation

- Number, Date & Time Validation
- Text and List Validation
- Custom validations based on formula for a cell
- Dynamic Dropdown List Creation using Data Validation – Dependency List

1 Hrs

Topic 9 Lookup Functions

- Vlookup / HLookup
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- Vlookup with Helper Column

2 Hrs

Hands on Practice_____ **2 Hrs**

Topic 10 Pivot Tables

- Creating Simple Pivot Tables
- Basic and Advanced Value Field Setting
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- What are the Array Formulas, Use of the Array Formulas?
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- Array with if, len and mid functions formulas.
- Advanced Use of formulas with Array.

Hands on Practice _____ **3 Hrs**

Topic 11 Charts and slicers and Excel Dashboard **2 Hrs**

- Various Charts i.e. Bar Charts / Pie Charts / Line Charts
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- Adding Tables and Charts to Dashboard
- Adding Dynamic Contents to Dashboard

Hands on Practice _____ **2 Hrs**

Topic 12 VBA Macro **3 Hrs**

Introduction to VBA

- What Is VBA? What Can You Do with VBA?
- Recording a Macro
- Procedure and functions in VBA

Variables in VBA

- What is Variables?
- Using Non-Declared Variables
- Variable Data Types
- Using Const variables

Message Box and Input box Functions

- Customizing Msgboxes and Input box
- Reading Cell Values into Messages
- Various Button Groups in VBA

If and select statements

- Simple If, Elseif Statements
- Defining select case statements

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- Outlook Configurations, MAPI
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- Merge Worksheets using Macro
- Merge multiple excel files into one sheet
- Split worksheets using VBA filters
- Worksheet copiers

Hands on Practice _____ **4 Hrs**

Therory Hours	Lab Hours	Total
20 hours	20 Hours	40 Hours

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Syllabus- Add On Course for MBA– III Sem

Advanced Excel

Session 2021-22

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Topic 2 Formatting and Proofing — 1 Hrs

- Currency Format, Format Painter
- Formatting Dates
- Custom and Special Formats
- Formatting Cells with Number formats, Font formats, Alignment, Borders
- Basic conditional formatting

Hands on Practice — **2 Hrs**

Topic 3 Mathematical Functions and Protecting Excel — **1 Hrs**

- SumIf, SumIfs CountIf, CountIfs AverageIf, AverageIfs, Nested IF, IFERROR Statement, AND, OR, NOT
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Topic 4 Text Functions and Date and Time Functions — **1 Hrs**

- Upper, Lower, Proper
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- Trim, Len, Exact
- Concatenate
- Find, Substitute
- Today, Now
- Day, Month, Year
- Date, Date if, DateAdd
- EOMonth, Weekday

Hands on Practice — 2 Hrs

Topic 5 Advanced Paste Special Techniques in Excel 2013 / 2016 & 365 — 3 Hrs

- Paste Formulas, Paste Formats
- Paste Validations
- Transpose Tables

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- New Charts – Tree map & Waterfall
- Sunburst, Box and whisker Charts
- Combo Charts – Secondary Axis
- Adding Slicers Tool in Pivot & Tables
- Using Power Map and Power View
- Forecast Sheet
- Sparklines -Line, Column & Win/ Loss
- Using 3-D Map
- New Controls in Pivot Table – Field, Items and Sets
- Various Time Lines in Pivot Table
- Auto complete a data range and list
- Quick Analysis Tool
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- Filtering on Text, Numbers & Colors
- Sorting Options
- Advanced Filters on 15-20 different criteria(s) Printing Workbooks
- Setting Up Print Area
- Customizing Headers & Footers
- Designing the structure of a template
- Print Titles –Repeat Rows / Columns

Hands on Practice **3 Hrs**

Topic 6 Advance Excel What If Analysis **2 Hrs**

- Goal Seek
- Scenario Analysis
- Data Tables (PMT Function)
- Solver Tool

Topic 7 Logical Functions **2 Hrs**

- If Function
- How to Fix Errors – if error
- Nested If
- Complex if and or functions

Hands on Practice **2 Hrs**

Topic 8 Data Validation **1 Hrs**

- Number, Date & Time Validation
- Text and List Validation
- Custom validations based on formula for a cell
- Dynamic Dropdown List Creation using Data Validation – Dependency List

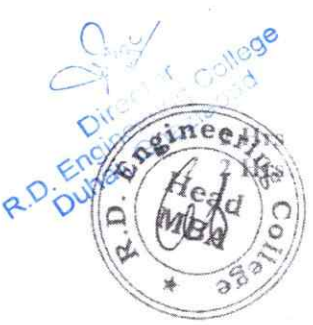
Topic 9 Lookup Functions **1 Hrs**

- Vlookup / HLookup
- Index and Match
- Creating Smooth User Interface Using Lookup
- Nested VLookup
- Reverse Lookup using Choose Function
- Worksheet linking using Indirect
- Vlookup with Helper Column

Hands on Practice

Topic 10 Pivot Tables

- Creating Simple Pivot Tables
- Basic and Advanced Value Field Setting
- Classic Pivot table
- Choosing Field
- Filtering PivotTables
- Modifying PivotTable Data
- Grouping based on numbers and Dates
- Calculated Field & Calculated Items



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- Arrays Functions
- What are the Array Formulas, Use of the Array Formulas?
- Basic Examples of Arrays (Using ctrl+shift+enter).
- Array with if, len and mid functions formulas.
- Advanced Use of formulas with Array.

Hands on Practice_____ 3 Hrs

Topic 11 Charts and slicers and Excel Dashboard

- Various Charts i.e. Bar Charts / Pie Charts / Line Charts
- Using SLICERS, Filter data with Slicers
- Manage Primary and Secondary Axis
- Adding Tables and Charts to Dashboard
- Adding Dynamic Contents to Dashboard

Hands on Practice_____ 2 Hrs

Topic 12 VBA Macro 3 Hrs

Introduction to VBA

- What Is VBA? What Can You Do with VBA?
- Recording a Macro
- Procedure and functions in VBA

Variables in VBA

- What is Variables?
- Using Non-Declared Variables
- Variable Data Types
- Using Const variables

Message Box and Input box Functions

- Customizing Msgboxes and Input box
- Reading Cell Values into Messages
- Various Button Groups in VBA

If and select statements

- Simple If, Elseif Statements
- Defining select case statements

Looping in VBA

- Introduction to Loops and its Types
- The Basic Do and For Loop
- Exiting from a Loop
- Advanced Loop Examples

Mail Functions – VBA

- Using Outlook Namespace
- Outlook Configurations, MAPI
- Worksheet / Workbook Operations
- Merge Worksheets using Macro
- Merge multiple excel files into one sheet
- Split worksheets using VBA filters
- Worksheet copiers

Hands on Practice_____ 4 Hrs

Theory Hours	Lab Hours	Total
16 hours	16 Hours	

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Syllabus- Add On Course for B.Tech ECE – V Sem

IoT

Session 2021-22

This Course focuses on hands-on IoT concepts such as sensing, actuation and communication. It covers the development of Internet of Things (IoT) prototypes—including devices for sensing, actuation, processing, and communication—to help you develop skills and experiences. The Internet of Things (IoT) is the next wave, world is going to witness. Today we live in an era of connected devices the future is of connected things.

Topic 1. Introduction to IoT **3 Hrs**

- Understanding IoT fundamentals
- IoT Architecture and protocols
- Various Platforms for IoT
- Real time Examples of IoT
- Overview of IoT components and IoT Communication Technologies
- Challenges in IoT

Topic 2. Arduino Simulation Environment **3 Hrs**

- Arduino Uno Architecture
- Setup the IDE, Writing Arduino Software
- Arduino Libraries
- Basics of Embedded C programming for Arduino
- Interfacing LED, push button and buzzer with Arduino
- Interfacing Arduino with LCD

Hands on Practice **2 Hrs**

Topic 3. Sensor & Actuators with Arduino **2 Hrs**

- Overview of Sensors working
- Analog and Digital Sensors
- Interfacing of Temperature, Humidity, Motion, Light

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- Interfacing of Actuators with Arduino.
- Interfacing of Relay Switch and Servo Motor with Arduino

Hands on Practice _____ **3 Hrs**

Topic 4. Basic Networking with ESP8266 WiFi module **3 Hrs**

- Basics of Wireless Networking
- Introduction to ESP8266 Wi-Fi Module
- Various Wi-Fi library
- Web server- introduction, installation, configuration
- Posting sensor(s) data to web server

Hands on Practice _____ **2 Hrs**

Topic 5. IoT Protocols **2 Hrs**

- M2M vs. IoT
- Communication Protocols

Topic 6. Cloud Platforms for IOT **3 Hrs**

- Virtualization concepts and Cloud Architecture
- Cloud computing, benefits
- Cloud services -- SaaS, PaaS, IaaS
- Cloud providers & offerings
- Study of IoT Cloud platforms
- Interfacing ESP8266 with Web services

Hands on Practice _____ **3 Hrs**

Topic 7. Project _____ **6 Hrs**

Therory Hours	Lab Hours	Total
16 hours	16 Hours	32 Hours

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Syllabus- Add On Course for B.Tech ECE – III Sem

PCB Design

Session 2021-22

This is a basic course for designing of PCB using software. PCB (Printed Circuit Board) designing is an integral part of each electronics products and this program is designed to make students capable to design their own projects PCB up to industrial grade.

Topics Covered:

1. Introduction to PCB designing concepts
2. Component introduction and their categories
3. Introduction to Development Tools
4. Detailed description and practical of PCB designing
5. Lab practice and designing concepts

Detailed Syllabus of the Course

Topic 1: Introduction to PCB designing concepts

Introduction & Brief History **1 Hrs**

- What is PCB
- Difference between PWB and PCB
- Types of PCBs: Single Sided (Single Layer), Multi-Layer (Double Layer)
- PCB Materials

Introduction to Electronic design Automation (EDA) **1 Hrs**

- Brief History of EDA
- Latest Trends in Market
- How it helps and Why it requires
- Different EDA tools
- Introduction to SPICE and PSPICE Environment
- Introduction and Working of PROTEUS

Hands on Practice **2 Hrs**

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Topic 2: Component introduction and their categories

Types of Component **2 Hrs**

- Active Components
  - Diode
  - Transistor
  - MOSFET
  - LED
  - SCR
  - Integrated Circuits (ICs)
- Passive Components
  - Resistor
  - Capacitor
  - Inductor
  - Transformer
  - Speaker/Buzzer

Component Package Types **2 Hrs**

- Through Hole Packages
  - Axial lead
  - Radial Lead
  - Single Inline Package(SIP)
  - Dual Inline Package(DIP)
  - Transistor Outline(TO)
  - Pin Grid Array(PGA)
- Through Hole Packages
  - Metal Electrode Face(MELF)
  - Leadless Chip Carrier(LCC)
  - Small Outline Integrated Circuit(SOIC)
  - Quad Flat Pack(QPF) and Thin QFP (TQFP)
  - Ball Grid Array(BGA)
  - Plastic Leaded Chip Carrier(PLCC)

Hands on Practice **2 Hrs**

Topic 3: Introduction to Development Tools **2 Hrs**

- Introduction to PCB Design using OrCAD tool
- Introduction to PCB Design using PROTEUS tool

Hands on Practice **2 Hrs**

Topic 4: Detailed description and practical of PCB designing

PCB Designing Flow Chart **2 Hrs**

- Schematic Entry
- Net listing
- PCB Layout Designing
- Prototype Designing
  - Design Rule Check(DRC)
  - Design For Manufacturing(DFM)

- PCB Making
  - Printing

- Etching
- Drilling

- Assembly of components

2 Hrs

Description of PCB Layers

- Electrical Layers
  - Top Layer
  - Mid Layer
  - Bottom Layer
- Mechanical Layers
  - Board Outlines and Cutouts
  - Drill Details

- Documentation Layers
  - Components Outlines
  - Reference Designation
  - Text

1 Hrs

Keywords & Their Description

- Footprint
- Pad stacks
- Vias
- Tracks
- Color of Layers
- PCB Track Size Calculation Formula

1 Hrs

PCB Materials

- Standard FR-4 Epoxy Glass
- Multifunctional FR-4
- Tetra Functional FR-4
- NelcoN400-6
- GETEK
- BT Epoxy Glass
- Cyanate Aster
- Plyimide Glass
- Teflon

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1 Hrs

Rules for Track

- Track Length
- Track Angle
- Rack Joints
- Track Size

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Hands on Practice_____ **2 Hrs**

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Topic 5: Lab practice and designing concepts

Starting the PCB designing — 2 Hrs

- Understanding the schematic Entry
- Creating Library & Components
- Drawing a Schematic
- Flat Design / hierarchical Design
- Setting up Environment for PCB
- Design a Board

Auto routing — 1 Hrs

- Introduction to Auto routing
- Setting up Rules
- Defining Constraints
- Auto router Setup

PCB Designing Practice — 2 Hrs

- PCB Designing of Basic and Analog Electronic Circuits
- PCB Designing of Power Supplies
- PCB Designing of Different Sensor modules
- PCB Designing of Electronics Projects
- PCB Designing of Embedded Projects

Post Designing & PCB Fabrication Process — 4 Hrs

- Printing the Design
- Etching
- Drilling
- Interconnecting and Packaging electronic Circuits (IPC) Standards
- Gerber Generation
- Soldering and De-soldering
- Component Mounting
- PCB and Hardware Testing

Hands on practice (Project work) — 8 Hrs

- Making the schematic of Academic and Industrial projects
- PCB Designing of these projects
- Soldering and De-soldering of components as per Design
- Testing and Troubleshooting Methods

Theory Hours	Lab Hours	Total
20 hours	20 Hours	40 Hours

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Auto CAD
Add On Course for B. Tech (ME, III Sem) Session 2021-22

Syllabus

Beginner AutoCAD

Learn basic drawing and modifying techniques for drafting and technical drawing, using AutoCAD to create drawings that can be used to build and real objects both mechanical andarchitectural. We'll cover basic methods of printing and plotting layouts and sheets, working between model space and paper space, and scaling drawings through viewports.

Course Outline

1: Getting Started with AutoCAD

- Opening and Creating Drawings
- Exploring the AutoCAD interface
- Zooming and Panning

2: Basic Drawing & Editing Commands

- Using the Mouse, Keyboard, and Enter Key to work quickly and efficiently in AutoCAD Lines
- Circles
- Rectangles

3: Creating a Simple Drawing

- Creating Simple Drawings
- Using Modify tools to arrange an office layout

4: Drawing Precision in AutoCAD

- Polar and Ortho Tracking Entering
- Coordinates and AnglesObject
- Snaps and Tracking

5: Making Changes in Your Drawing

- Move
- Copy
- Rotate
- Mirror
- Scale
- Using the reference option with the Scale Tool

6: Drawing Templates

- Using Template Files (.dwt) to Make New Drawing
- Exploring what Settings and Elements are saved with Templates

7: Organizing Your Drawing with Layers

- Layer States
- Properties by Layer
-

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Layer Tools

8: Object Types

- Polylines
- Arcs
- Polygons
- Ellipses

9: Editing Commands

- Trim and Extend
- Fillet and Chamfer
- Polyline Edit and Spline
- Offset and Explode Join

10: Inserting Blocks

- The Insert Block Command Inserting

  Blocks with Tool PalettesDynamic

  Blocs

  Migrating Blocks and other Elements between Drawings with Design Center

11: Adding Dimensions

- Using Dimensioning Tools
- Dimensioning in a Layout Tab vs. the Model TabUsing
- Dimension Styles
- Editing Dimensions

Theory/ Lab	Total Hours
32 Hrs	32

Mr. Pawan Yadav
Trainer

Prof. Sanjay Paliwal
Head ME

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