

## DESIGN AND DEVELOPMENT OF CURRICULUM FOR ADD – ON COURSE (Value Added Course)

### KCE STAFF DESIGNED ADD-ON COURSES

**APPROVED BY ANNA UNIVERSITY**

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3.	Electronics and Communication Engineering	88-102
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5.	Mechanical Engineering	115-126

*K. S. S. S.*  
17/11/21  
IQAC Coordinator

*J. S. S. S.*  
17/11/2021  
Principal

# **DEPARTMENT OF CIVIL ENGINEERING**

# **ACADEMIC YEAR**

## **2020-2021**





## DEPARTMENT OF CIVIL ENGINEERING

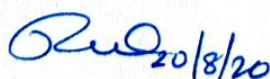
### DESIGN AND DEVELOPMENT OF CURRICULUM FOR ADD - ON COURSE (Value Added Course)

### CVA001 & CONSTRUCTION TECHNOLOGY

#### Table of Contents

S.No	Academic Year 2020-21
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STAFF INCHARGE

 20/8/20  
HOD/CIVIL  
**HOD**  
Department of Civil Engineering  
Kings College of Engineering  
Punalkulam, Thanjavur - 613 303

 20/8/2020  
PRINCIPAL  
PRINCIPAL  
Kings College of Engineering  
PUNALKULAM - 613 303.



Dr. J. Arputha Vijaya Selvi, M.E., Ph.D.,  
PRINCIPAL

Ref: KCE / PRL / VAC-5/20-21

19.08.2020

To

The Director,  
Center for Academic Courses,  
Anna University,  
Chennai - 25.

Respected Sir,

Sub: Requisition for approving the Value Added Course on **Construction Technology (CE 501)**  
for the batch of 2018 - 2022 -reg

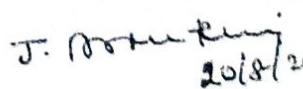
As per the AU Regulation 2017, the Civil Engineering department of our college has planned to conduct the Value Added Course with 2 credits on the topic of Construction Technology for the batch 2018 -2022 having the strength of 28 students.

We received approval from Centre for Academics Courses, Anna University, Chennai (as cited above) for the above mentioned value added course during the Academic year 2019-2020 and a batch of 38 students had completed the value added course successfully.

In this regard, we seek your consent to conduct the same value added course during the current academic year (2020 -2021 Odd Semester).

Thanking You,

Regards,

  
20/8/2020.  
(J.Arputha Vijaya Selvi)

Principal

**KINGS COLLEGE OF ENGINEERING,  
PUNALKULAM,  
GANDARVAKOTTAI TK,  
PUDUKKOTTAI DT. 613 303.**

Encl:

- i) Copy of the Approval letter
- ii) Copy of the Approved Syllabus
- iii) Copy of the Timetable

CE501

CONSTRUCTION TECHNOLOGY

L T P C  
2 0 0 2**UNIT I      STANDARD METHODS OF MEASUREMENTS AND UNITS      6**

System of units-Fundamental & Derived units-conversion of units -Civil engineering measurements- Measurements of materials and works-Accuracy of results.

**UNIT II      BUILDING PLANNING      6**

Building plan-Specifications-Drawing- Building bye laws and Regulations

**UNIT III ESTIMATION-ABSTRACT AND DETAILING      6**

Types of Estimates-Detail & Abstract Estimates of Buildings- Analysis of Rates- Estimation of Quantities of Steel & RCC Elements-Earthwork calculations-Detailed estimate.


**UNIT IV      STRUCTURAL ELEMENTS      6**

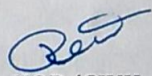
Materials for Reinforced Concrete-Bar Bending-Sheet centering-Scaffolding.

**UNIT V      FIELD/SITE WORK/CONSTRUCTION ACTIVITIES      6**

Site marking-Foundation-Plinth Beam-Components of building

**TOTAL : 30 PERIODS**

  
STAFF INCHARGE  
(Mr.K.RANJITH)

  
HOD/CIVIL  
(Mrs.R.REVATHI)





**DEPARTMENT OF CIVIL ENGINEERING  
COURSE PLAN**

Sub. Code	: CE501	Branch/Year/Sem	: B.E CIVIL /III/V
SubName	: Construction Technology	Batch	: 2018-2022
Staff Name	: Mr.K.Ranjith	Academic Year	: 2020-2021 (ODD)

**COURSE OBJECTIVE**

Students will be able to:

- To learn the fundamental units of materials used in construction.
- To know the specifications used for building planning.
- To learn the abstract Estimates of Buildings
- To understand the effect of bar bending in reinforced concrete.
- To know the field work in construction
- To know and understand the general construction processes and their sequences

**TEXTBOOKS:**

- T1. N.Mathankumar, "Estimating and Quantity Surveying", ARS Publications, Chennai 2018  
T2. G.S.Birdie and T.D.Ahuja., "Building Construction and Construction materials", Dhanpat Rai Publishing Company, 4th edition, New Delhi, 2007.

**REFERENCES:**

- R1.Karthikeyan.N,V.Soundararajan, K.Chandrasekar,"Construction Materials", ARS Publications, Chennai, 2015.  
R2.Bhavikatti.S.S, "Building Materials", Vikas Publishing House Pvt Ltd,2015.

**WEB RESOURCES**

- W1.<https://www.slideshare.net/mrmartella/standards-of-measurement-presentation> (Topic.No:01)  
W2. <https://www.slideshare.net/RCNandish/buy-laws> (Topic.No:10)  
W3. <https://nptel.ac.in/courses/105104161/8> (Topic.No:12)  
W4. <https://nptel.ac.in/courses/105102088/2> (Topic.No:17)  
W5. <https://nptel.ac.in/courses/105102105102088/#> (Topic.No:20)



Topic No	Topic	Books for Reference	Page No.	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
<b>UNIT I STANDARD METHODS OF MEASUREMENTS AND UNITS</b>						<b>6</b>
01	System of units	T1 W1	1.8	BB PPT	1	1
02	Fundamental & Derived units	T1	1.8	BB	1	2
03	Conversion of units	T1	1.8	BB	1	3
04	Civil engineering measurements	T1 R1	1.11 17,35	BB	1	4
05	Measurements of materials and works	T1	95-112	BB	1	5
06	Accuracy of results	T1	1.10	BB	1	6

**LEARNING OUTCOME**

At the end of this unit, students will be able to

- Learn about the Fundamental & Derived units
- Understand the Civil engineering measurements

<b>UNIT II BUILDING PLANNING</b>						<b>6</b>
7	Building plan	T2 R2	26.489 1.1	BB	2	8
8	Specifications	T1 T2	3.16-3.37 21.435- 21.449	BB	1	9
9	Drawing	T2	26.491- 26.502	BB	2	11
10	Building bye laws and Regulations	T2 W2	26.493	BB PPT	1	12

**LEARNING OUTCOME**

At the end of this unit, students will be able to

- Draw the Building plan
- Study the building regulations

<b>UNIT III ESTIMATION-ABSTRACT AND DETAILING</b>						<b>6</b>
11	Types of Estimates	T1	1.3	BB	1	13
12	Detail & Abstract Estimates of Buildings	T1 W3	1.5-1.6	BB NPTEL	1	14
13	Analysis of Rates	T1 T2	3.4-3.9 21.439	BB	1	15
14	Estimation of Quantities of Steel & RCC Elements	T1	1.12-1.16	BB	1	16
15	Earthwork calculations	T1 R1	2.42 126	BB	1	17
16	Detailed estimate	T1	1.7-1.88	BB	1	18

**LEARNING OUTCOME**

At the end of this unit, students will be able to

- Study the analysis of rates
- Understand the Earthwork calculations



Topic No	Topic	Books for Reference	Page No.	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
<b>UNIT IV</b>		<b>STRUCTURAL ELEMENTS</b>				<b>6</b>
17	Materials for Reinforced Concrete	T2 R1 W4	18.348 95-115	BB NPTEL	2	20
18	Bar Bending	T2 R2	18.350 4.20	PPT	1	21
19	Sheet centering	T2	7.178	BB	2	23
20	Scaffolding	T2 W5	7.172	NPTEL	1	24

**LEARNING OUTCOME**

At the end of this unit, students will be able to

- Know the materials required for Reinforced Concrete
- Understand the requirement of bar bending and Sheet centering

<b>UNIT V</b>		<b>FIELD/SITE WORK/CONSTRUCTION ACTIVITIES</b>				<b>6</b>
21	Site marking	T2	2.13-2.14	On site	2	26
22	Foundation	T2 R2	3.2-3.5 4.2	On site	2	28
23	Plinth Beam	T2	3.69	On site	1	29
24	Components of building	T2	8.185 9.217 10.235	On site	1	30

**LEARNING OUTCOME**

At the end of this unit, students will be able to

- Do the Site marking in Construction
- Know the reinforcement detailing in Foundation

**COURSE OUTCOME**

At the end of the course, the students will be able to

- To understand the knowledge of planning and construction
- Learn the building bye laws and regulations
- Know the sustainable concept in constructions
- Understand the concept of doing scaffolding in construction site

**CONTENT BEYOND THE SYLLABUS**

- Study of building construction in India.

**INTERNAL ASSESMENT DETAILS**

ASS NO	I	II
TOPIC	1-14	15-24
DATE		

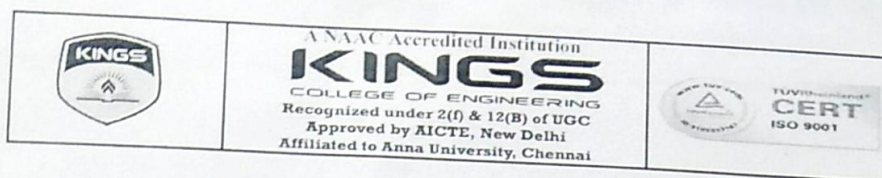
Prepared by  
Mr. K. RANJITH, AP/CIVIL

J. R. R. R. R.  
20/8/2020

Verified By  
HOD/CIVIL

Approved by  
PRINCIPAL





**DEPARTMENT OF CIVIL ENGINEERING**  
**TIME TABLE (AUG 2020 - DEC 2020, ODD SEM)**  
**VALUE ADDED COURSE: B.E - CE (Regulation 2017)**

Batch:2018-2022

Year &amp; Semester : III / V

Session	1	2	3		4	5	6
Day	09:30 AM - 10:30 AM	10:30 AM - 11:30 AM	11:30 AM - 12:30 PM	12:30 PM - 01:30 PM	01:30 PM - 02:30 PM	02:30 PM - 03:30 PM	03:30 PM - 04:30 PM
SAT	CE501 (Construction Technology)			LUNCH BREAK			

SUB CODE	NAME OF THE SUBJECT	CREDITS	NAME OF THE STAFF	DEPT	PERIODS/WEEK
CE501	Consrtuction Technology	2	Mr.K.Ranjith	CE	3

*Ranjith*  
 20/8/2020  
 HOD / CIVIL

*J. Praveen*  
 20/8/2020  
 PRINCIPAL





CENTRE FOR ACADEMIC COURSES  
ANNA UNIVERSITY  
CHENNAI - 600 075

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22357074  
Fax / Dir 22352272

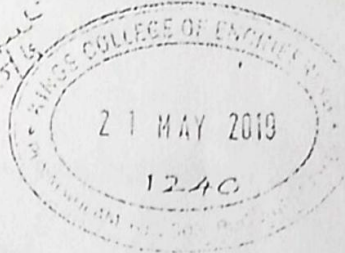


Dr. R. RAJU  
DIRECTOR  
Letter No.2359/AU/VA/CAC/2019

copy to HOD (Civil)  
21/5/19

15 05 2019

To  
The Controller of Examinations  
Anna University  
Chennai - 25



Sir,

Sub : A U. - CAC - Affiliated Institutions - Value Added Course - Reg.  
Ref : Letter No.KCE/PRL/VAC/106/18-19, dated:07.05.2019.

With reference to the letter cited above, the following Value Added Course offered by Kings College of Engineering, Pudukkottai, Affiliated Institutions is allotted the course code as detailed below.

S.No	Code Allotted	Title
1	CVA001	Construction Technology

This is for your kind information and necessary action at your end.

Yours faithfully,

*[Signature]*  
16/5/19

DIRECTOR

Copy to:

1. The Chairperson, Faculty of Civil Engineering, Anna University, Chennai - 25.
2. The Principal, Kings College of Engineering, Punalkulam, Gandarvakottai Taluk, Pudukkottai District, Tamilnadu - 613 303.
3. The Stock File

**AFFILIATED INSTITUTIONS**  
**FACULTY OF CIVIL ENGINEERING**  
**APPROVED LIST OF VALUE ADDED COURSES**

Sl. No	Code	Subject name	L	T	P	C
1.	CVA001	Construction Technology	2	0	0	2
2.	CVA002	Integrated Structural Engineering of Building Structures	1	0	0	1
3.	CVA003	Computational Fluid Dynamics	1	0	0	1
4.	CVA004	AUTOCAD	1	0	2	2
5.	CVA005	Structural Analysis and Design	1	0	2	2
6.	CVA006	Civil Engineering Drawing and Bar Bending Schedule	2	0	0	2
7.	CVA007	Project Planning and Management	1	0	2	2
8.	CVA008	Interior Decoration	1	0	0	1
9.	CVA009	Vaasthu and Building Plan	1	0	0	1
10.	CVA010	3D's MAX	2	0	0	2
11.	CVA011	STAAD Pro Design Software	1	0	0	1
12.	CVA012	STAAD Pro V8i	1	0	2	2
13.	CVA013	STAAD Pro V8i Series 4	1	0	2	2
14.	CVA014	Primavera (P6) Project Management	1	0	0	1
15.	CVA015	Safety Aspects in Construction	2	0	0	2
16.	CVA016	3D Building Design Using Revit Architecture	2	0	0	2
17.	CVA017	Computer Applications in Civil Engineering	2	0	0	2
18.	CVA018	Industrial Waste Management	2	0	0	2
19.	CVA019	Professional Practices in Civil Engineering Construction	2	0	0	2
20.	CVA020	3D Printing Technology for Civil Engineering	1	0	0	1
21.	CVA021	Building Modeling Using 3D Revit Architecture	2	0	0	2
22.	CVA022	Project Scheduling with Primavera P6	2	0	0	2
23.	CVA023	E Tabs Software	0	0	2	1
24.	CVA024	Geospatial Mapping	0	0	2	1
25.	CVA025	Modern Equipments and Its Applications	2	0	0	2

26.	CVA026	Advanced Field Surveying	0	0	2	1
27.	CVA027	Model Generation and Static Analysis of Structures	0	0	2	1
28.	CVA028	Recent Trends in Design and Detailing of Structures	0	0	2	1
29.	CVA029	Design and Systematic Analysis of Civil Structures	2	0	0	2
30.	CVA030	Building Information Modeling and MS Project	2	0	0	2
31.	CVA031	Fire Protection, Services and Maintenance Management of Building	2	0	0	2

*Upt*  
26/9/2020

DIRECTOR  
CENTRE FOR ACADEMIC COURSES

*23/9/2022*

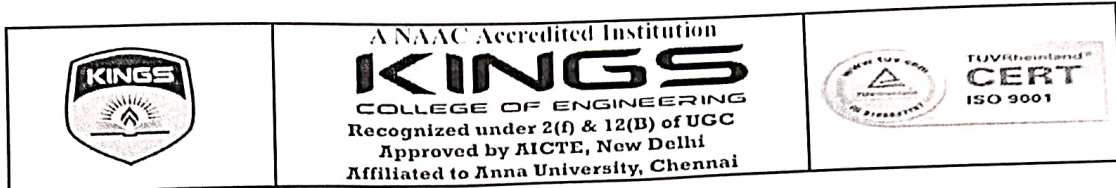


**DEPARTMENT OF  
COMPUTER SCIENCE  
AND ENGINEERING**

**ACADEMIC**

**YEAR**

**2020-2021**



# DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

## DESIGN AND DEVELOPMENT OF CURRICULUM FOR ADD-ON COURSE (VALUE ADDED COURSE)

**IVA005 - VB.NET**

### Table of Contents

S.No	ACADEMIC YEAR 2020-2021
1	Requisition Letter from college to Anna University
2	Add-On Course Syllabus
3	Course Plan
4	Time Table
5	Approval Letter from Anna University
6	Anna University Approved Value Added Course List IVA005 VB.NET listed at Anna University Website S.No : 5

*[Signature]*  
20/01/21  
Course Co-ordinator

*[Signature]* 20/1/20  
HOD/CSE  
H.O.D of Computer Science & Engineering  
KINGS COLLEGE OF ENGINEERING  
Punalkulam, Gandarvakottai (Tk)  
Pudukottai (Dt) - 613 303.

*[Signature]*  
20/1/2020  
PRINCIPAL  
PRINCIPAL  
Kings College of Engineering  
PUNALKULAM - 613 303.



Dr. J. Arputha Vijaya Selvi, M.E., Ph.D.,  
PRINCIPAL

Ref: KCE / PRL / VAC/20-21

20.08.2020

To  
The Director  
Center for Academic Courses  
Anna University, Chennai

Respected Sir,

Sub: Requisition for approving the Value Added Course on VB.Net for the  
batch of 2018 - 2022 -reg

Ref: Letter No. 2521/AU/VA/CAC/2019 dt. 30.05.2019

As per the AU Regulation 2017, CSE department of our college has planned to conduct the Value Added Course with 2 credits on the topic of VB.NET for the batch 2018 -2022 having the strength of 45 students.

We received approval from Center for Academic Courses, Anna University, Chennai (as cited above) for the above mentioned value added course during academic year 2018 - 2019 and a batch of 46 students had completed the value added course successfully.

In this regard, we seek your consent to conduct the same value added course during the current academic year 2020 - 2021 (Odd Semester).

Thank You,

Regards,

J. Arputha Selvi  
20/8/2020

Encl:

- i) Copy of the Approval letter
- ii) Copy of the Approved Syllabus
- iii) Copy of the timetable



## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### VALUE ADDED COURSE

**SUB CODE/NAME: IVA005/VB.NET**

**YEAR / SEMESTER: III / V**

**PREPARED BY,  
R.SUGANTHA LAKSHMI / CSE  
G.CHANDRA PRABA / CSE**





## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### SYLLABUS

**IVA005 - VB.NET**

**L T P C**  
**1 0 2 2**

#### **UNIT I VISUAL BASIC .NET AND THE .NET FRAMEWORK 9**

Introduction to .net framework -Features, Common Language Runtime (CLR) ,Framework Class Library(FCL).Visual Studio.Net – IDE, Languages Supported, Components. Visual Programming, VB.net - Features, IDE- Menu System, Toolbars, Code Designer, Solution Explorer, Object Browser, Toolbox, Class View Window, Properties Window, Server Explorer, Task List, Output Window, Command Window.

#### **UNIT II ELEMENTS OF VISUAL BASIC .NET 9**

Properties, Events and Methods of Form, Label, TextBox, ListBox, Combo Box, RadioButton, Button, Check Box, Progress Bar, Date Time Picker, Calendar, Picture Box, HScrollbar, VScrollbar, Group Box, ToolTip,Timer.

#### **UNIT III PROGRAMMING IN VISUAL BASIC .NET 9**

Data Types, Keywords, Declaring Variables and Constants, Operators, Understanding Scope and accessibility of variables, Conditional Statements- If- Then, If-Then-Else, Nested If, Select Case, Looping Statement- Do loop, For Loop, For Each-Next Loop, While Loop, Arrays- Static and Dynamic.

#### **UNIT IV FUNCTIONS, BUILT-IN DIALOG BOXES, MENUS AND TOOLBAR 9**

Menus and toolbars- Menu Strip, Tool Strip, Status Strip, Built-In Dialog Boxes –Open File Dialogs, Save File Dialogs, Font Dialogs, Color Dialogs, Print Dialogs, InputBox, Msg Box, Interfacing With End user- Creating MDI Parent and Child, Functions and Procedures- Built-In Functions- Mathematical and String Functions, User Defined Functions and Procedures.

#### **UNIT V ADVANCED CONCEPTS IN VB.NET 9**

Object Oriented Programming- Creating Classes , Objects, Fields, Properties, Methods, Events , Constructors and destructors, Exception Handling- Models, Statements, Data Access withADO.Net , Data Access with ServerExplorer, Data Adapter and DataSets, ADO.NET Objects and Basic SQL.

**Note:** Hands-on sessions with the objective of one application development.

**Total : 45 periods**



## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### COURSE PLAN

**Sub.Code/Name** : IVA005/VB.NET

**Branch / Year / Sem** : CSE / III / V

**Academic Year** : 2020-21 (ODD)

**Batch** : 2018-2022

**Staff Name** : Mrs R.Sugantha Lakshmi & Mrs.G.Chandra Praba

### Course objectives

- Learn the fundamentals of VB.NET
- Understand the elements of VB.NET
- Learn the programming concepts and develop applications on VB.NET.
- Make the students aware of data access

### Books Recommended for Reading and Reference:

1. Visual Basic.Net Programming Black Book by Steven Holzner, Dreamtech Press
2. The Complete Reference Visual Basic .NET by Jeffrey R. Shapiro ,Tata McGraw Hills.
3. Murach's Beginning Visual basic .Net By Anne Prince, BPB Publications

### Web Resources

1. [https://www.oreilly.com/library/view/programming-visual basic/0596000936](https://www.oreilly.com/library/view/programming-visual-basic/0596000936)
2. <https://udemy.com/visual-basic-net-step-by-step-for-beginners>
3. [https:// www.freevbcode/vb-net-asp-net](https://www.freevbcode.com/vb-net-asp-net)
4. [https:// www.codeproject.com/kb/vb](https://www.codeproject.com/kb/vb)
5. [https:// www.tutorialspoint.com/vb.net](https://www.tutorialspoint.com/vb.net)

S.No	Topics	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
UNIT I VISUAL BASIC .NET AND THE .NET FRAMEWORK				9
1.	Introduction to .net framework -Features, Common Language Runtime (CLR), Framework Class Library(FCL).	BB	2	2
2.	Visual Studio.Net – IDE, Languages Supported, Components.	BB	1	3
3.	Visual Programming, VB.net - Features, IDE- Menu System, Toolbars, Code Designer, Solution Explorer, Object Browser	PPT	1	4
		Hands-on-session	2	6
4.	Toolbox, Class View Window, Properties Window, Server Explorer, Task List, Output Window, Command Window.	PPT	1	7
		Hands-on-session	2	9
UNIT II ELEMENTS OF VISUAL BASIC .NET				9
5.	Properties, Events and Methods of Form	PPT	1	10
		Hands-on-session	2	12
6.	Label, TextBox, ListBox, Combo Box, RadioButton, Button, Check Box	PPT	1	13
		Hands-on-session	2	15
7.	Progress Bar, Date Time Picker, Calendar, Picture Box, HScrollbar, VScrollBar, Group Box, ToolTip,Timer.	PPT	1	16
		Hands-on-session	2	18
UNIT III PROGRAMMING IN VISUAL BASIC .NET				9
8.	Data Types, Keywords, Declaring Variables and Constants, Operators, Understanding Scope and accessibility of variables	PPT	1	19
		Hands-on-session	2	21
9.	Conditional Statements- If- Then, If-Then-Else, Nested If, Select Case	PPT	1	22
		Hands-on-session	2	24
10.	Looping Statement- Do loop, For Loop, For Each-Next Loop, While Loop, Arrays- Static and Dynamic.	PPT	1	25
		Hands-on-session	2	27



S.No	Topics	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
UNIT IV FUNCTIONS, BUILT-IN DIALOG BOXES, MENUS AND TOOLBAR				9
11.	Menus and toolbars- Menu Strip, Tool Strip, Status Strip - Built-In Dialog Boxes –Open File Dialogs, Save File Dialogs, Font Dialogs, Color Dialogs, Print Dialogs	PPT	1	28
		Hands-on-session	2	30
12.	InputBox, Msg Box, Interfacing With End user, Creating MDI Parent and Child	PPT	1	31
		Hands-on-session	2	33
13.	Functions and Procedures- Built-In Functions- Mathematical and String Functions - User Defined Functions and Procedures.	PPT	1	34
		Hands-on-session	2	36
UNIT V ADVANCED CONCEPTS IN VB.NET				9
14.	Object Oriented Programming- Creating Classes , Objects, Fields, Properties, Methods, Events - Constructors and destructors, Exception Handling- Models, Statements	PPT	1	37
		Hands-on-session	2	39
15.	Data Access with ADO.Net , Data Access with ServerExplorer , Data Adapter and DataSet	PPT	1	40
		Hands-on-session	2	42
16.	ADO.NET Objects and Basic SQL.	PPT	1	43
		Hands-on-session	2	45

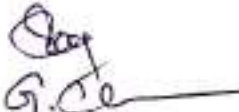
### Course Outcome

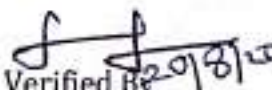
Upon the completion of the course, the students are able to

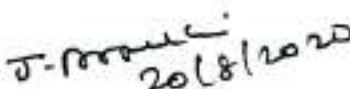
- Describe the basic concepts of VB.NET
- Work on VB.NET IDE
- Develop simple applications
- Create applications using MDI
- Access datasets and databases

### INTERNAL ASSESSMENT DETAILS

TEST NO.	I	II
Topic Nos.	1-10	11-16

Prepared by  
  
**Ms. R. Sugantha Lakshmi**  
**Ms. G. Chandra Praba**

Verified By   
**HOD/CSE**

  
 20/8/2020  
 Approved by  
**PRINCIPAL**



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING  
**TIME TABLE (2020 - 2021 ODD SEM)**

B.E - CSE (Regulation 2017)

Batch:2018-2022

Strength:45

Year: III Semester: V Class Room : 222 Block: II

Session	1	2	10.45 am - 11.00 am	3	4	12.30 pm - 01.10 pm	5	6	7	03.25 pm - 03.40 pm	8
Day	09.15am - 10.00am	10.00am - 10.45am		11.00am - 11.45am	11.45am - 12.30pm		01.10pm - 01.55pm	01.55pm - 02.40pm	02.40pm - 03.25pm		03.40pm - 04.30pm
MON	IVA005	IVA005	BREAK	IVA005	IVA005	LUNCH BREAK	-	-	-	BREAK	-
TUE	IVA005	IVA005		IVA005	IVA005		-	-	-		-
WED	IVA005	IVA005		IVA005	IVA005		-	-	-		-
THU	IVA005	IVA005		IVA005	IVA005		-	-	-		-
FRI	IVA005	IVA005		IVA005	IVA005		-	-	-		-

SUB CODE	NAME OF THE SUBJECT	NAME OF THE STAFF	DEPT	PERIODS/WEEK
IVA005	VB.NET	Ms.R.SuganthaLakshmi(8211008) & Ms.G.Chandrapraba(8211212)	CSE	20

K. Adarsh  
HOD 20/8/20

J. Praveen  
20/8/2020  
PRINCIPAL





Off. 22357077 / 73  
22357074  
Fax / Dir 22352272

**CENTRE FOR ACADEMIC COURSES**  
ANNA UNIVERSITY  
CHENNAI - 600 025



Dr. R. RAJU  
DIRECTOR

Letter No:2521/AU/VA/CAC/2019

To  
The Controller of Examinations  
Anna University  
Chennai - 25.



Sir,

Sub : A.U. - CAC - Affiliated Institutions - Value Added Course - Reg.  
Ref : Letter No.KCE/PRL/VAC/115/18-19, dated 22.05.2019.

\*\*\*\*\*

With reference to the letter cited above, the following Value Added Course offered by Kings College of Engineering, Affiliated Institutions is allotted the course code as detailed below.

SI.NO	CODE ALLOTTED	TITLE
1.	IVA005	VB.NET

This is for your kind information and necessary action at your end.

Yours faithfully,

30/05/19  
DIRECTOR

Copy to:

1. The Chairperson, Faculty of Information and Communication Engineering, A.U., CH-25.
2. The Principal, Kings College of Engineering, Punalkulam, Gandarvakottai Taluk, Pudukkottai District - 613 303
3. The Stock File



**AFFILIATED INSTITUTIONS  
FACULTY OF INFORMATION AND COMMUNICATION ENGINEERING  
LIST OF VALUE ADDED COURSES**

S. NO	CODE ALLOTTED	COURSE TITLE	CREDITS				
			L	T	P	C	
1.	IVA001	Design Thinking	1	0	1	2	
2.	IVA002	PCB Design, Embedded System Interfacing with Arduino & Robotics	1	0	1	2	
3.	IVA003	Interactive Web Designing and Progressive Java	1	0	1	2	
4.	IVA004	Robotics and its Applications	1	0	1	2	
5.	IVA005	VB.NET	1	0	2	2	
6.	IVA006	Enterprise Application Development and Deployment on Cloud using IBM Bluemix	0	0	2	1	
7.	IVA007	Predictive Modeling using IBM SPSS Modeler	0	0	2	1	
8.	IVA008	Enterprise Mobile Application Development using IBM Worklight	0	0	2	1	
9.	IVA009	iOS App Development	0	0	2	1	
10.	IVA010	Transfer Learning Frameworks	0	0	2	1	
11.	IVA011	Data Science with Python	1	0	1	2	
12.	IVA012	Internet of Things with Node MCU	0	0	2	1	
13.	IVA013	Virtual Instrumentation	1	0	1	2	
14.	IVA014	IC Test Engineering	1	0	1	2	
15.	IVA015	Learning C	1	0	1	2	
16.	IVA016	Internet of Things Using Broadcom BCM2837	1	0	1	2	
17.	IVA017	PHP and MYSQL	0	0	2	1	
18.	IVA018	Advanced Python and Introduction to Machine Learning	0	0	2	1	
19.	IVA019	Real Time Electronics System Design	1	0	1	2	
20.	IVA020	Case Study – Operating System Design	0	0	2	1	
21.	IVA021	Case Study – Network Design	0	0	2	1	
22.	IVA022	Electronic Circuits Making and PCB Design	0	0	2	1	
23.	IVA023	Data Mining Laboratory	0	0	2	1	
24.	IVA024	Multimedia Laboratory	0	0	2	1	
25.	IVA025	Visual Basic Laboratory	0	0	2	1	
26.	IVA026	Advanced Java Programming	1	0	1	2	
27.	IVA027	Website Blog Design	0	0	2	1	
28.	IVA028	Virtual Instrumentation Using Lab View	1	0	1	2	
29.	IVA029	Angular J S	0	0	2	1	
30.	IVA030	Simulation and Analysis of Networks Using Software (NS-2)	0	0	2	1	
31.	IVA031	The Ruby Programming Language	0	0	2	1	
32.	IVA032	VB.Net Programming	0	0	2	1	

**DEPARTMENT OF  
ELECTRONICS AND  
COMMUNICATION  
ENGINEERING**

**ACADEMIC  
YEAR  
2020 - 2021**





## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

### DESIGN AND DEVELOPMENT OF CURRICULUM FOR ADD - ON COURSE (Value Added Course)

### IVA019 & Real Time Electronics and System Design

#### Table of Contents

S.No	Academic Year 2020-21
1.	Requisition Letter From College to Anna University
2.	Add - On Course Syllabus
3.	Course Plan
4.	Time Table
5.	Approval Letter From Anna University
6.	Anna University Approved Value Added Course List - IVA019 & Real Time Electronics and System Design listed at University Website S.No : 19

  
Course Coordinator

  
HoD/ECE

  
Principal

**H.O.D.**  
ELECTRONICS AND COMMUNICATION ENGINEERING  
**KINGS COLLEGE OF ENGINEERING**  
PUNALKULAM - 613 303.  
GANDARVAKOTTAI TALUK, PUDUKOTTAI DISTRICT

**PRINCIPAL**  
Kings College of Engineering.  
PUNALKULAM - 613 303.



Dr. J. Arputha Vijaya Selvi, M.E., Ph.D.,  
**PRINCIPAL**

Ref: KCE / PRL / VAC/20-21 / VAC-03

19.08.2020

To  
The Director  
Center for Academic Courses  
Anna University, Chennai

Respected Sir,

Sub: Requisition for approving the Value Added Course on Real time  
Electronics System Design for the batch of 2018 - 2022 -reg

Ref: Letter No. 2520/AU/VA/CAC/FICE/2019 dt. 16.08.2019

As per the AU Regulation 2017, ECE department of our college has planned to conduct the Value Added Course with 2 credits on the topic of Real time Electronics System Design for the batch 2018 -2022 having the strength of 39 students.

We received approval from Center for Academic Courses, Anna University, Chennai (as cited above) for the above mentioned value added course during academic year 2018 - 2019 and a batch of 48 students had completed the value added course successfully.

In this regard, we seek your consent to conduct the same value added course during the current academic year 2020 - 2021 (Odd Semester).

Thank You,

Regards,

*J. Arputha Selvi*  
19/8/2020  
**PRINCIPAL**  
**Kings College of Engineering,**  
**PUNALKULAM - 613 303**

Encl:

- i) Copy of the Approval letter
- ii) Copy of the Approved Syllabus
- iii) Copy of the timetable

**SYLLABUS****IVA019****REAL TIME ELECTRONICS SYSTEM DESIGN****L T P C  
1 0 1 2****UNIT I REAL TIME ELECTRONICS SYSTEM COMPONENTS 6**

Introduction-Functional components of real time electronics system-Analog IO devices-Digital IO devices-Processor -Memory devices -communication modules.

**UNIT II CREATING APPLICATIONS WITH  $\mu$ VISION4 SOFTWARE TOOL 6**

Development Tools-  $\mu$ VISION4 Integrated development tool-Debugger-Compiler-Simulator-Keil RTX RTOS kernel-Creating Embedded Programs-Building the project-Logic Analyzer-Programming Flash devices.

**UNIT III HARDWARE DESIGN AND DEVELOPMENT 6**

ATmega328P microcontroller - memory Integration-Interfacing compact Flash and SD cards-IO device Integration- Interfacing display device, switch, Buzzer, Relay -Sensor Integration-Interfacing gas sensor, Ultrasonic sensor, Infrared sensor, Accelerometer, gyro meter and magnetometer.

**UNIT IV PROGRAMMING OF WIRELESS COMMUNICATION MODULES 6**

Wireless Technology for control applications -Development and implementation of wireless communication using Zigbee, Bluetooth, LiFi, and Wi-Fi - Development and Implementation of wireless control using RF transceiver, GSM and GPS.

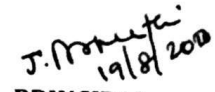
**UNIT V IMPLEMENTATION OF REAL TIME APPLICATIONS 6**

Automatic Irrigation System -Real time air pollution monitoring system using GSM and GPS-LPG gas leakage and fire alert safety system-camera based anti theft security system-Remote wireless control of electrical and electronics home appliances/industrial machines- Smart watch for heart rate and BP monitoring.

**TOTAL: 30 PERIODS**

  
Staff in-charge  
JEYASEELAN.T, AP/ECE

  
HOD/ ECE

  
PRINCIPAL  
PRINCIPAL  
Kings College of Engineering,  
PUNALKULAM - 613 303

VA-RES.D.2

KCE/ECE/CP/III-YR/RESD





**KINGS**  
COLLEGE OF ENGINEERING  
(NAAC Accredited Institution)  
(Approved by AICTE, New Delhi, Affiliated to  
Anna University, Chennai)



## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

### COURSE PLAN

<b>Sub. Code</b> : IVA019	<b>Branch / Year / Sem</b> : B.E ECE / III / V
<b>Sub. Name</b> : Real Time electronics system design	<b>Batch</b> : 2018-2022
<b>Staff Name</b> : Mr.T.Jeyaseelan	<b>Academic Year</b> : 2020 - 21 (ODD)

#### COURSE OBJECTIVE

- To make the students to apply fundamental concepts in Electronics systems for providing solutions for real-time system design.
- To provide practical experience to the students on interfacing of Input-Output devices, communication devices with the processor.
- To introduce the basic concepts in Hardware and software design.
- To practice the students in order to implement electronics system for the real time applications

#### TEXT BOOKS

- T1.** "Real-Time Systems Design Principles for Distributed Embedded Applications", Hermann Kopetz, Kluwer Academic Publishers.
- T2.** The 8051 Microcontroller Architecture, Programming and Applications", Kenneth J. Ayala, THOMSON Learning.

#### REFERENCE BOOKS

- R1.** "Embedded C", Michael J. Pont, Pearson Education.
- R2.** "Sensors and Transducers", Ian R. Sinclair, Third edition, Newnes.
- R3.** "8051 Micro controller An applications based Introducton" David Calcutt, Fred Cowan Hassan Parchizadeh, Elsevier.
- R4.** "C Programming for Embedded Systems", Kirk zurell, R&D books, CMP media, Inc, USA.

#### WEB RESOURCES

- W1.** <https://nptel.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Embedded%20systems/Pdf/Lesson-3.pdf> (Topic No. 01, 05, 06)
- W2.** [http://www.eng.auburn.edu/~nelson/courses/elec3040\\_3050/C%20programming%20for%20embedded%20system%20applications.pdf](http://www.eng.auburn.edu/~nelson/courses/elec3040_3050/C%20programming%20for%20embedded%20system%20applications.pdf) (Topic No. 09, 10, 11)
- W3.** <https://cs.wmich.edu/alfuqaha/spring15/cs6570/lectures/PHY-MAC-Bluetooth-ZigBee-rev2.pdf> (Topic No. 19)
- W4.** [https://www.electronics-tutorials.ws/io/io\\_7.html](https://www.electronics-tutorials.ws/io/io_7.html) (Topic No. 18)
- W5.** <https://www.engineersgarage.com/microcontroller/8051projects> (Topic No. 20-30)

Topic No	Topic	Books for Reference	Page No.	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
<b>UNIT I REAL TIME ELECTRONICS SYSTEM COMPONENTS (6)</b>						
1.	Introduction	T1 W1	1-8	PPT	1	1
2.	Functional components of real time electronics system	T1	30-35	PPT	1	2
3.	Analog IO modules	R2	87-115	PPT	1	3
4.	Digital IO modules	R2	37-40	PPT	2	5
5.	Processor, Memory devices	W1		PPT		
6.	communication modules	W1		PPT	1	6
<b>LEARNING OUTCOME</b>						
At the end of unit, students will be able to						
<ul style="list-style-type: none"> <li>Know the functional components of Real time electronic system.</li> <li>Understand the concept and architecture of real-time system.</li> </ul>						
<b>UNIT II CREATING APPLICATIONS WITH <math>\mu</math>VISION4 SOFTWARE TOOL (6)</b>						
7.	Development Tools	R1	36-37	PPT	2	8
8.	$\mu$ VISION4 Integrated development tool	R1	38-40	Practical		
9.	Debugger-Compiler-Simulator-Keil RTX RTOS kernel	R4, W2	60-63	Practical	1	9
10.	Creating Embedded Programs	R4, W2	64	Practical	1	10
11.	Building the project	R4 W2	63,66	Practical	1	11
12.	Logic Analyzer- Programming Flash devices.	R1	43-45	Practical	1	12
<b>LEARNING OUTCOME</b>						
At the end of unit, students will be able to						
<ul style="list-style-type: none"> <li>Know the basics of <math>\mu</math>VISION4 Software Tool.</li> <li>Develop an embedded System for a typical electronic application.</li> </ul>						
<b>UNIT III HARDWARE DESIGN AND DEVELOPMENT (6)</b>						
13.	ATmega328P microcontroller	T2	11-22	PPT	1	13
14.	Memory Integration- Interfacing compact Flash and SD cards	T2	22-28	Practical	1	14
15.	IO device Integration- Interfacing display device, switch, Buzzer, Relay	T2	163-166	Practical	1	15
16.	Sensor Integration- Interfacing gas sensor-gyro meter and magnetometer	R2	87-115	Practical	1	16

VA-RES.D.4

KCE/ECE/CP/III-YR/RES.D

17.	Ultrasonic sensor, Infrared sensor and Accelerometer.	R2	116 - 155, 164-167	Practical	1	17
18.	Stepper motor and dc motor.	W4	-	Practical	1	18

**LEARNING OUTCOME**

At the end of unit, students should be able to

- Study the architectural features of AVR microcontroller.
- Know the interfacing of I/O devices and sensors with AVR microcontroller.

**UNIT IV****PROGRAMMING OF WIRELESS COMMUNICATION MODULES****(6)**

Topic No	Topic	Books for Reference	Page No.	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
19.	Wireless technology for industrial and control applications	W3	-	PPT	1	19
20.	Development and implementation of wireless communication using Zigbee	W5	-	Practical	1	20
21.	Bluetooth	W5	-	Practical	1	21
22.	LiFi, and Wi-Fi.	W5	-	Practical	1	22
23.	Development and Implementation of wireless control using using RF transceiver, GSM	W5	-	Practical	1	23
24.	GPS	W5	-	Practical	1	24

**LEARNING OUTCOME**

At the end of unit, students will be able to

- Interface wireless communication module for real-time system.
- Implement wireless communication application.

**UNIT V****REAL TIME SYSTEM APPLICATION EXAMPLES****(6)**

25.	Automatic Irrigation System on sensing soil moisture content	W5	-	Practical	1	25
26.	Real time air pollution monitoring system using GSM and GPS	W5	-	Practical	1	26
27.	LPG gas leakage and fire alert safety system	W5	-	Practical	1	27
28.	camera based anti theft security system	W5	-	Practical	1	28
29.	Remote wireless control of electrical and electronics home appliances/industrial machines	W5	-	Practical	1	29
30.	Smart watch for heart rate and BP monitoring	W5	-	Practical	1	30

**LEARNING OUTCOME**

At the end of unit, students will be able to

- Design Real-time Electronics systems.
- Implement Real-time Electronics applications.



**COURSE OUTCOME**

At the end of the course, the students will be able to

- Apply knowledge of basic Electronics for realizing real time electronics system
- Design applications based on sensors, IO devices, peripheral ICs and microcontroller.
- Formulate Hardware and software design of real-time system.
- Build real-time electronic applications.

**INTERNAL ASSESSMENT DETAILS**

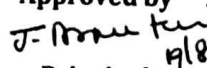
ASST. NO.	I	II
Topic Nos.	1 - 15	16-30
Date		

  
Prepared by

Mr.T.Jeyaseelan

  
Verified by 18/8/2020

HOD/ECE

Approved by  
  
Principal 18/8/2020  
Principal  
Kings College of Engineering,  
PUNALKULAM - 613 303



**DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**  
**Academic Year 2020-21 / ODD Semester**

**VALUE ADDED COURSE TIME TABLE**

**B.E -ECE (Regulation 2017)**

**Batch : 2018-2022**

**Year & Branch: III ECE**

**Semester: V**

Session	1	2	3	12.30 P.M - 1.30 P.M	4	5	6
Day	9.30 A.M - 10.30 A.M	10.30 A.M - 11.30 A.M	11.30 A.M - 12.30 P.M		1.30 P.M - 2.30 P.M	2.30 P.M - 3.30 P.M	3.30 P.M - 4.30 P.M
<b>SAT</b>	IVA019 (Theory Session)	IVA019(Practical Session)	IVA019(Practical Session)	<b>LUNCH BREAK</b>			

SUB CODE	NAME OF THE SUBJECT	CREDITS	NAME OF THE STAFF	DEPT	PERIODS/WEEK
IVA019	Real Time Electronics System Design	2	Mr.T.Jeyaseelan	ECE	3

DEPT.VACC

HOD/ECE

18/8/2020

PRINCIPAL

**PRINCIPAL**  
**Kings College of Engineering,**  
**PUNALKULAM - 613 303**



**CENTRE FOR ACADEMIC COURSES**  
ANNA UNIVERSITY  
CHENNAI - 600 025

Off: 22357077 / 73  
22357074  
Fax / Dir : 22352272



Dr. R. RAJU  
DIRECTOR  
Letter No.2520/AU/VA/CAC/FICE/2019

16.08.2019

To  
The Controller of Examinations  
Anna University  
Chennai - 25.

Sir,

Sub: A.U. - CAC - Affiliated Institutions - Value Added Courses - Reg.  
Ref: Letter No.KCE/PRL/VAC/125/18-19.  
\*\*\*\*\*

With reference to the letter cited, the following Value Added Courses offered by Kings College of Engineering, Affiliated Institutions is allotted the course code as detailed below.

SI.NO	CODE ALLOTTED	TITLE	Credits			
			L	T	P	C
1.	IVA019	Real Time Electronics System Design	1	0	1	2

This is for your kind information and necessary action at your end.

Yours faithfully,

  
DIRECTOR

**Copy to:**

1. The Principal, Kings College of Engineering, Chennai - Bangalore Highway, Opposite to Hyundai Motors, Sriperumbudur Taluk, Irungattukottai - 602117
2. The Chairperson, Faculty of Information and Communication Engineering, A.U., Chennai -25.
3. The Stock File.

*J. Moni*  
19/8/2020  
PRINCIPAL  
Kings College of Engineering,  
PUNALKULAM - 613 303



**AFFILIATED INSTITUTIONS  
FACULTY OF INFORMATION AND COMMUNICATION ENGINEERING  
LIST OF VALUE ADDED COURSES**

S. NO	CODE ALLOTTED	COURSE TITLE	CREDITS
			L T P C
1.	IVA001	Design Thinking	1 0 1 2
2.	IVA002	PCB Design, Embedded System Interfacing with Arduino & Robotics	1 0 1 2
3.	IVA003	Interactive Web Designing and Progressive Java	1 0 1 2
4.	IVA004	Robotics and its Applications	1 0 1 2
5.	IVA005	VB.NET	1 0 2 2
6.	IVA006	Enterprise Application Development and Deployment on Cloud using IBM Bluem`ix	0 0 2 1
7.	IVA007	Predictive Modeling using IBM SPSS Modeler	0 0 2 1
8.	IVA008	Enterprise Mobile Application Development using IBM Worklight	0 0 2 1
9.	IVA009	iOS App Development	0 0 2 1
10.	IVA010	Transfer Learning Frameworks	0 0 2 1
11.	IVA011	Data Science with Python	1 0 1 2
12.	IVA012	Internet of Things with Node MCU	0 0 2 1
13.	IVA013	Virtual Instrumentation	1 0 1 2
14.	IVA014	IC Test Engineering	1 0 1 2
15.	IVA015	Learning C	1 0 1 2
16.	IVA016	Internet of Things Using Broadcom BCM2837	1 0 1 2
17.	IVA017	PHP and MYSQL	0 0 2 1
18.	IVA018	Advanced Python and Introduction to Machine Learning	0 0 2 1
19.	IVA019	Real Time Electronics System Design	1 0 1 2
20.	IVA020	Case Study – Operating System Design	0 0 2 1
21.	IVA021	Case Study – Network Design	0 0 2 1
22.	IVA022	Electronic Circuits Making and PCB Design	0 0 2 1
23.	IVA023	Data Mining Laboratory	0 0 2 1
24.	IVA024	Multimedia Laboratory	0 0 2 1
25.	IVA025	Visual Basic Laboratory	0 0 2 1
26.	IVA026	Advanced Java Programming	1 0 1 2
27.	IVA027	Website Blog Design	0 0 2 1
28.	IVA028	Virtual Instrumentation Using Lab View	1 0 1 2
29.	IVA029	Angular J S	0 0 2 1
30.	IVA030	Simulation and Analysis of Networks Using Software (NS-2)	0 0 2 1
31.	IVA031	The Ruby Programming Language	0 0 2 1
32.	IVA032	VB.Net Programming	0 0 2 1
33.	IVA033	Networking Design and Security	0 0 2 1



34.	IVA034	Radio Frequency Circuit Design	1 0 2 2
35.	IVA035	Internet of things (IOT) Application Development	1 0 2 2
36.	IVA036	Advanced Graphical System Design and DAS Design	1 0 2 2
37.	IVA037	Lab VIEW Programming	0 0 2 1
38.	IVA038	Smart Home – Theory and Practices	1 0 2 2
39.	IVA039	Ethical Hacking	1 0 2 2
40.	IVA040	System Design Using Micro Controllers	1 0 2 2
41.	IVA041	Robotic Process Automation Using Automation Anywhere	1 0 2 2
42.	IVA042	Blockchains and Cryptocurrencies	1 0 2 2
43.	IVA043	Non Linear Electronics and Modelling	1 0 2 2
44.	IVA044	Intrusion and Anomaly Detection Systems	1 0 2 2
45.	IVA045	React Framework	0 0 2 1
46.	IVA046	Advanced Graphical System Design DAS Design using NI technology	0 0 2 1
47.	IVA047	Embedded Systems Design using PIC Controller	1 0 2 2
48.	IVA048	PCB Designing	0 0 2 1
49.	IVA049	Verilog and System Verilog	1 0 2 2
50.	IVA050	Hands-on training on LabVIEW Core1	1 0 2 2
51.	IVA051	Administrative Essentials for New Admins in Lighting Experience	1 0 2 2
52.	IVA052	Data Visualization and Machine Learning using Python	0 0 2 1
53.	IVA053	Robotics Programming	0 0 2 1
54.	IVA054	Troubleshooting and Maintenance of Home Appliances	0 0 2 1
55.	IVA055	Communication and Image Processing Using MATLAB	1 0 2 2
56.	IVA056	Big Data Statistical Analysis Using R Programming	1 0 2 2
57.	IVA057	Network Engineering – Routing and Switching	1 0 2 2
58.	IVA058	Web Application Development using ASP.NET	0 0 2 1
59.	IVA059	AWS and Azure Cloud Management	1 0 2 2
60.	IVA060	Full Stack Web Development	1 0 2 2
61.	IVA061	Embedded using Raspberry Pi	1 0 2 2
62.	IVA062	Data Science in R and Python	1 0 2 2
63.	IVA063	Mobile Phone Technology	1 0 2 2
64.	IVA064	Arduino Programming	0 0 2 1
65.	IVA065	Ethical Hacking and Network Security	1 0 2 2
66.	IVA066	Machine learning Techniques	0 0 2 1
67.	IVA067	IOT using Arduino	1 0 2 2
68.	IVA068	End to End Project Implementation using Spring Framework	0 0 2 1
69.	IVA069	Django Web Application Framework	0 0 2 1
70.	IVA070	Model Development using Exploratory Analysis	0 0 2 1
71.	IVA071	Attacks and Vulnerabilities Laboratory	0 0 2 1
72.	IVA072	Augmented and virtual Reality	1 0 2 2
73.	IVA073	MEMS and NEMS	1 0 2 2

74.	IVA074	Blockchain Technology and its Essentials	0 0 2 1
75.	IVA075	Machine Intelligence	1 0 2 2
76.	IVA076	Cyber Security Practices	0 0 2 1
77.	IVA077	Data Science	0 0 2 1
78.	IVA078	Internet of Things Practices	0 0 2 1
79.	IVA079	Kotlin Programming	0 0 2 1
80.	IVA080	PCB Design and Fabrication	0 0 2 1
81.	IVA081	Advanced Arduino Programming and Its Application	0 0 2 1
82.	IVA082	Robotics in Biomedical Engineering	0 0 2 1
83.	IVA083	Connected Car-Electronics	1 0 2 2
84.	IVA084	Embedded Systems Design Using ARM LPC2148	1 0 2 2
85.	IVA085	Design and Analysis of MOS Circuits	1 0 2 2
86.	IVA086	MERN Stack	1 0 2 2
87.	IVA087	CANSAT Design and Development	1 0 2 2
88.	IVA088	Azure AI and Cloud Data Fundamentals	0 0 2 1
89.	IVA089	Linux Administration	1 0 2 2



**DIRECTOR  
CENTRE FOR ACADEMIC COURSES**



# Department of Electrical and Electronics Engineering

# Academic year 2020-2021



**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**  
**DESIGN AND DEVELOPMENT OF CURRICULUM FOR**  
**ADD – ON COURSE (Value Added Course)**  
**EVA002 - ADVANCES IN SOLAR ENERGY TECHNOLOGIES**  
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<b>Academic Year 2020-21</b>	
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4.	Time Table
5.	Approval Letter from Anna University
6.	Anna University Approved Value Added Course List - <b>EVA002 - Advances in Solar Energy Technologies</b>

*[Signature]*  
**Staff In-charge**

*[Signature]* 9/2/21  
**Head of the Department**

*[Signature]*  
 9/2/2021

**PRINCIPAL**  
**Kings College of Engineering**  
**PUNALKULAM-613 303.**



Dr. J. Arputha Vijaya Selvi, M.E., Ph.D.,  
**PRINCIPAL**

Ref: KCE / PRL / VAC/20-21

19.06.2020

To  
The Director  
Center for Academic Courses  
Anna University, Chennai

Respected Sir,

**Sub: Requisition for approving the Value Added Course on Advances in Solar Energy Technologies for the batch of 2018 -2022 -reg**

As per the AU Regulation 2017, the EEE department of our college has planned to conduct the **Value Added Course with 2 credits on the topic of Advances in Solar Energy Technologies for the batch 2018 -2022 having the strength of 15 students.** Herewith the syllabus and course plan are enclosed. We request you to kindly approve organizing the course and its syllabus. With your consent, we will organize the course during the current academic session **(2020 - 2021 Odd Semesters).**

Thanking You,

Yours faithfully,

*J. Arputha Selvi*

**PRINCIPAL**  
**Kings College of Engineering**  
**PUNALKULAM-613 303.**

Encl:

- i) Syllabus
- ii) Course Plan

Copy to  
The Controller of Examinations, Anna University, Chennai - 600 025.

**SYLLABUS****EVA002****ADVANCES IN SOLAR ENERGY TECHNOLOGIES****L T P C**  
**2 0 0 2****UNIT I****ADVANCES IN SOLAR PV MATERIALS****6**

Semiconductor Materials and Modelling - Crystalline silicon solar cells - Thin film technologies - Space and concentrator cells - Organic and dye sensitized cells - Evaluating a Site for Solar PV Potential.

**UNIT II****MPPT CRITERIA FOR PV SYSTEMS****6**

Testing, Monitoring and Calibration - Photovoltaic System Components - Maximum Power Point Tracking Algorithms - Different MPPT techniques - Implementation of MPPT using a boost converter.

**UNIT III****STAND ALONE PV SYSTEM****6**

Solar modules - storage systems - power conditioning and regulation - MPPT- protection - Stand-alone PV systems design - sizing.


**UNIT IV****GRID CONNECTED PV SYSTEMS****6**


PV systems in buildings - design issues for central power stations - safety - Economic aspect - Efficiency and performance - International PV programs.

**UNIT V****MODELLING AND SIMULATION OF PV SYSTEMS USING MATLAB****6**

Introduction to Systems - Systems Modeling - Formulation of State Space Model of Systems - Model Order Reduction - Interpretive Structural Modeling - System Dynamics Techniques - Simulation.

**TOTAL: 30 PERIODS**

  
**Mr. J. Arokia Raj**  
Faculty in-charge

  
**HOD/ EEE**





## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE PLAN

<b>Sub. Code</b> : EVA002	<b>Branch / Year / Sem</b> : B.E EEE / III / V
<b>Sub. Name</b> : Advances In Solar Energy Technologies	<b>Batch</b> : 2018-2022
<b>Staff Name</b> : Mr.J.Arokiaraj	<b>Academic Year</b> : 2020 - 21 (ODD)

### COURSE OBJECTIVE

1. To get an overview of different types of photovoltaic semiconductor devices and their characteristics.
2. To analyze the operation and performance parameters MPPT criteria for PV systems.
3. To study the operation techniques and basics topologies standalone operation of PV system.
4. To learn the different techniques of grid connected PV system.
5. To study the modelling and simulation of PV systems using MATLAB.

### TEXT BOOKS

- T1. Solar Cells: Materials, Manufacture and Operation, Tom Markvart University of Southampton, UK and Luis Castafier Universidad Politecnica de Catalunya, Barcelona, Spain, First edition 2005 Reprinted 2005, 2006, Elsevier Ltd.
- T2. Study of maximum power point tracking (MPPT) techniques in a solar photovoltaic array, Arjav Harjai, Abhishek Bhardwaj, Mrutyunjaya Sandhibigraha, nit, Rourkela.
- T3. Solanki C.S., "Solar Photovoltaics: Fundamentals, Technologies And Applications", PHI Learning Pvt. Ltd., 2015.
- T4. Modeling and Simulation of Systems Using MATLAB and Simulink, Devendra K. Chaturvedi, CRC Press, 2010 by Taylor and Francis Group, LLC.

### REFERENCE BOOKS

- R1. "Power Electronics for Renewable Energy Systems". C.R.Bala Murugan, D.Periyaazhagar, N.Suresh, Sruthi Publishers, Jan - 2017.
- R2. "Solar Photovoltaic Technology and systems", Chetan Singh Solanki, PHI Publications. 2017.

### WEB RESOURCES

- W1. <http://www.energy.wsu.edu/Documents/SolarPVforBuildersOct2009.pdf> (Topic No. 06)
- W2. <https://pdfs.semanticscholar.org/1db7/435215cb2d9895bc29e0358a9b23300988f5.pdf> (Topic No. 12)
- W3. <https://www.sciencedirect.com/science/article/pii/S0960148105002831> (Topic No. 22)
- W4. [http://www.os.ucg.ac.me//MS\\_kn.pdf](http://www.os.ucg.ac.me//MS_kn.pdf) (Topic No. 27)



Topic No	Topic	Books for Reference	Page No.	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
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**UNIT I****ADVANCES IN SOLAR PV MATERIALS****(6)**

1.	Semiconductor Materials and Modelling	T1	30-52	BB	1	1
2.	Crystalline silicon solar cells.	T1	72-86	BB	1	2
3.	Thin film technologies.	T1	218-337	PPT	1	3
4.	Space and concentrator cells.	T1	354-388 393-442	BB	2	5
5.	Organic and dye sensitized cells.					
6.	Evaluating a Site for Solar PV Potential.	W1	-	PPT	1	6

**LEARNING OUTCOME**

At the end of unit, students should be able to

- Describe the basic materials of PV cells.
- Understand the concepts of PV Power Generation semiconductor devices.

**UNIT II****TESTING, CALIBRATION AND MPPT CRITERIA FOR PV SYSTEMS****(6)**

7.	Testing.	T1	452-497	PPT	2	8
8.	Monitoring and Calibration.					
9.	Photovoltaic System Components.	T2	17-25	BB	1	9
10.	Maximum Power Point Tracking Algorithms.	T2	25 -29	BB	2	11
11.	Different MPPT techniques.					
12.	Implementation of MPPT using a boost converter.	W2	-	BB	1	12

**LEARNING OUTCOME**

At the end of unit, students should be able to

- Study and analyze the Solar Photovoltaic System Components.
- To develop the different maximum power point tracking algorithms.
- To implement the various techniques of MPPT.

**UNIT III****STAND ALONE PV SYSTEM****(6)**

13.	Solar modules.	T3	352-370	PPT	1	13
14.	Storage systems.	R2	120-142	BB	1	14
15.	Power conditioning and regulation.	R1	3.28-3.47	BB	1	15
16.	Protection.	R1	3.13-3.14	BB	1	16
17.	Stand-alone PV systems design.	T3	420-423	Sem	1	17
18.	Sizing.	T3	437-440	BB	1	18

**LEARNING OUTCOME**

At the end of unit, students should be able to

- Study and analyze the Solar Modules and Storage systems.
- Getting detailed operating for Standalone PV systems and Sizing.

**UNIT IV GRID CONNECTED PV SYSTEMS (6)**

Topic No	Topic	Books for Reference	Page No.	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
19.	PV systems in buildings.	T1	446-450	BB	1	19
20.	Design issues for central power stations.	R1	4.28-4.36	BB	1	20
21.	Safety.	T1	299-300	BB	1	21
22.	Economic aspect.	W3	-	PPT	1	22
23.	Efficiency and performance.	T1	173-177	BB	1	23
24.	International PV programs.	R1	5.31-5.32	BB	1	24

**LEARNING OUTCOME**

At the end of unit, students should be able to

- Study the Design issues for central power stations.
- Understand the Economic aspect, Efficiency and performance.

**UNIT V MODELLING AND SIMULATION OF PV SYSTEMS USING MATLAB (6)**

25.	Introduction to Systems.	T4	1-98	BB	1	25
26.	Systems Modeling.					
27.	Formulation of State Space Model of Systems.	W4	-	PPT	1	26
28.	Model Order Reduction.	T4	219-263	BB	1	27
29.	Interpretive Structural Modeling.	T4	300-325	BB	1	28
30.	System Dynamics Techniques	T4	327-344	BB	1	29
31.	Simulation.	T4	401-420	PPT	1	30

**LEARNING OUTCOME**

At the end of unit, students should be able to

- Understand the Impact of Simulation.
- Analyze of the techniques used for simulation tools.

**COURSE OUTCOME**

At the end of the course, the students will be able to

- Use different materials used for photovoltaic cells manufacturing.
- Understand the principles and operation techniques used for MMPT.
- Analyze and design standalone operation of PV power generation.
- Describe the various grid connecting techniques for PV system.
- Understand the simulation tools used for photovoltaic power generation.

**INTERNAL ASSESSMENT DETAILS**

ASST. NO.	I	II
Topic Nos.	1 - 14	15-31
Date		

Prepared by

Mr.J.Arakiaraj

Verified by

HOD/EEE

Approved by

Principal





## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ACADEMIC YEAR 2020-2021 / ODD SEMESTER

### TIME TABLE for VALUE ADDED COURSES

III EEE

Class Strength : 15

Ses sion	1	11.30a.m -	2	12.45p.m -	3
Day	10.30 a.m - 11.30 a.m	11.45a.m	11.45 a.m - 12.45 p.m	1.30p.m	1.30 p.m - 2.30 p.m
SAT	EVA002	BREAK	EVA002	LUNCH BREAK	EVA002

SUB. CODE	NAME OF THE SUBJECT	NAME OF THE STAFF	DEPT.	PERIODS/WEEK
EVA002	Advances in solar energy technologies	Mr. J. Arokiaaraj	EEE	3

  
DEPT. VACC

  
HEAD OF THE DEPARTMENT

  
PRINCIPAL





copy to Ho D/EEB

**CENTRE FOR ACADEMIC COURSES**  
ANNA UNIVERSITY  
CHENNAI - 600 028

Off: 22357077 / 73

22357074

Fax / Dir : 22352272



**Dr. R. RAJU**  
**DIRECTOR**

Letter No: 2518/AU/EVA/CAC/2019

13.06.2019

To  
The Controller of Examinations  
Anna University  
Chennai - 25.



Sir,

Sub : A.U. - CAC - Kings College of Engineering - Value Added Course - Reg.

Ref. : Letter No. KCE/PRL/VAC/113/18-19, from Kings College of Engineering.  
Dated: 22.05.2019 & 07.06.2019.

With reference to the letter cited above, the following Value Added Course offered by Kings College of Engineering, Affiliated Institutions is allotted the course code as detailed below.

S.No	Code Allotted	Title
1.	EVA002	Advances In Solar Energy Technologies

This is for your kind information and necessary action at your end.

Yours faithfully

*[Signature]* 13/6/19

**DIRECTOR**

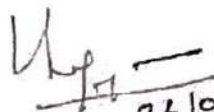
Copy to:

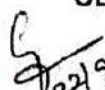
1. The Chairperson, Faculty of Electrical Engineering, Anna University, Chennai - 25.
2. The Principal, Kings College of Engineering, Punakulam, Gandarvakottai Taluk, Pudukkottai District, Tamilnadu - 613 303.
3. The Stock File

**AFFILIATED INSTITUTIONS**  
**FACULTY OF ELECTRICAL ENGINEERING**  
**APPROVED LIST OF VALUE ADDED COURSES**

Sl.No.	Subject Code	Subject Name	L	T	P	C
1.	EVA001	Solar Photovoltaic System Design	2	0	0	2
2.	EVA002	Advances in Solar Energy Technologies	2	0	0	2
3.	EVA003	Arduino Programming	1	0	0	1
4.	EVA004	Material Detection and Inspection Technology	1	0	2	2
5.	EVA005	Industrial Automation with PLC	0	0	2	1
6.	EVA006	Industrial Process Control and Instrumentation	0	0	2	1
7.	EVA007	Energy Conservation, Management and Audit	1	0	0	1
8.	EVA008	Field Oriented Control of BLDC, Induction and Synchronous Motors	1	0	0	1
9.	EVA009	Industrial Automation using PLC & SCADA	1	0	2	2
10.	EVA010	LabVIEW Core -1 and Core - 2 levels with Certified LabVIEW Developer (CLAD) Certification Training	2	0	0	2
11.	EVA011	Solar Photovoltaic Technology	2	0	0	2
12.	EVA012	Measurements in Process Industries	1	0	0	1
13.	EVA013	Automation and Control	0	0	2	1
14.	EVA014	ECAD	0	0	2	1
15.	EVA015	SCADA	0	0	2	1
16.	EVA016	Electric and Hybrid Vehicles	2	0	0	2
17.	EVA017	Programmable Logic Controller	1	0	0	1
18.	EVA018	Factory Automation	1	0	0	1
19.	EVA019	MATLAB and SIMULINK for Electrical Engineers	2	0	0	2
20.	EVA020	Electrical Machine Design	0	0	2	1
21.	EVA021	Abstract for Industrial Internet of Things with Real Time Data Logging	1	0	0	1

22.	EVA022	Industrial and Home Automation	2	0	0	2
23.	EVA023	Supervised Machine Learning for Image Classification	2	0	0	2
24.	EVA024	Fuzzy Logic System and Applications	2	0	0	2
25.	EVA025	Electronic Design Automation & PCB Designing by using ORCAD	2	0	0	2
26.	EVA026	Solar Power Design, Operation and Installation	2	0	0	2
27.	EVA027	Sensor Applications using Arduino and Raspberry Pi	2	0	0	2
28.	EVA028	Solar PV System Design and Installation.	2	0	0	2
29.	EVA029	Design and Development of Robotics	2	0	0	2
30.	EVA030	Embedded Laboratory	0	0	2	1
31.	EVA031	Graphical Programming Using Labview	1	0	2	2
32.	EVA032	VERILOG HDL	2	0	0	2
33.	EVA033	Electric Vehicles	2	0	0	2
34.	EVA034	Product Design and Development in Power Electronics and Embedded Systems	2	0	0	2
35.	EVA035	Trends in Smart Grid	1	0	0	1
36.	EVA036	Arduino Programming and Interfacing	0	0	2	1

  
 26/9/2020  
 DIRECTOR  
 CENTRE FOR ACADEMIC COURSES

  
 22/9/2020



**DEPARTMENT OF**  
**MECHANICAL ENGINEERING**

ACADEMIC

YEAR

2020-2021



**DEPARTMENT OF MECHANICAL ENGINEERING**  
**DESIGN AND DEVELOPMENT OF CURRICULUM FOR**  
**ADD – ON COURSE (Value Added Course)**

**MAV010 & Energy Resource Management**

**Table of Contents**

S.No	Academic Year 2020-21
1.	Requisition Letter From College to Anna University
2.	Add – On Course Syllabus
3.	Course Plan
4.	Time Table
5.	Approval Letter From Anna University
6.	Anna University Approved Value Added Course List – MAV010 & Energy Resource Management listed at University Website S.No : 10

  
 Course Coordinator

  
 HoD/Mech

**H.O.D**  
 DEPARTMENT OF MECHANICAL ENGINEERING  
 KINGS COLLEGE OF ENGINEERING  
 PUNALKULAM

  
 Principal

**PRINCIPAL**  
 Kings College of Engineering,  
 PUNALKULAM - 613 303.



Dr. J. Arputha Vijaya Selvi, M.E., Ph.D.,  
**PRINCIPAL**

Ref: KCE / PRL / VAC/20-21

19.06.2020

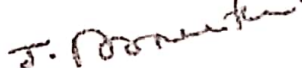
To  
The Director  
Center for Academic Courses  
Anna University, Chennai

Respected Sir,

**Sub: Requisition for approving the Value Added Course on Energy Resources and Management for the batch of 2018 - 2022 -reg**

As per the AU Regulation 2017, the Mechanical department of our college has planned to conduct the Value Added Course with 2 credits on the topic of **Energy Resources and Management** for the batch 2018 -2022 having the strength of 59 students. Herewith the syllabus and course plan are enclosed. We request you to kindly approve organizing the course and its syllabus. With your consent, we will organize the course during the current academic session (2020 - 2021 Odd Semesters).

Thanking You



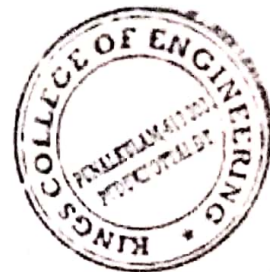
Yours faithfully


**Dr. J. Arputha Vijaya Selvi,**

PRINCIPAL B.E., M.E., Ph.D.  
Kings College of Engineering  
Punalakulam - 613 303

Encl:

- i) Syllabus
- ii) Course Plan
- iii) Time Table



Copy to  
 The Controller of Examinations, Anna University, Chennai - 600 025.  
Punalakulam, Gandarvakottai Taluk, Pudukkottai District - 613 303, Ph: 04362-282474, 282395, 282396. Fax: 04362-282494.

## SYLLABUS

MAV 010

ENERGY RESOURCES AND MANAGEMENT

L T P C

2 0 0 2

### **UNIT I FOSSIL FUEL ENERGY**

**6**

Coal, Oil, Natural gas, Nuclear power and Hydro - environmental impact of fossil fuels - Energy scenario in India - Growth of energy sector and its planning in India.

### **UNIT II SOLAR & WIND ENERGY- ALTERNATE SOURCE**

**6**

Solar thermal applications - heating, cooling, desalination, drying, cooking, etc. - solar thermal electric power plant - types of solar cells - Photovoltaic applications - Nature of the wind - factors influencing wind - wind data and energy estimation - wind resource assessment systems.

### **UNIT III BIO-ENERGY**

**6**

Biomass resources and their classification - Biomass conversion processes - direct combustion - biomass gasification - pyrolysis and liquefaction - biochemical conversion - anaerobic digestion - types of biogas Plant - applications - Urban waste to energy conversion.

### **UNIT IV OTHER TYPES OF ENERGY**

**6**

Ocean energy resources - ocean thermal power plant - ocean wave energy conversion - small hydro - geothermal energy - geothermal power plant - Fuel cell - principle of working - various types - construction and applications.

### **UNIT V ENERGY CONVERSION & MANAGEMENT**


**6**

Photovoltaic conversion of solar energy - Thermo chemical conversion - ocean thermal energy conversion (OTEC) - tidal energy conversion - Industrial management.

**TOTAL: 30 PERIODS**



**SIGNATURE OF STAFF INCHARGE**



**HOD/MECH**



A NAAC Accredited Institution  
**KINGS**  
 COLLEGE OF ENGINEERING  
 Recognized under 2(f) & 12(B) of UGC  
 Approved by AICTE, New Delhi  
 Affiliated to Anna University, Chennai



TUV Rheinland  
**CERT**  
 ISO 9001

## DEPARTMENT OF MECHANICAL ENGINEERING COURSE PLAN

<b>Sub. Code</b> : MAV 010	<b>Branch / Year / Sem:</b> B.E. Mech /III/V
<b>Sub. Name</b> : Energy Resources and Management	
<b>Staff Name</b> : M. Melwin J Sridhar	<b>Batch</b> : 2018-2022
	<b>Academic Year</b> : 2020-21 (ODD)

### COURSE OBJECTIVE

- ❖ To explain concept of various forms of Non-renewable and renewable energy.
- ❖ To outline division aspects and utilization of renewable energy sources for both domestics and industrial applications
- ❖ To study the environmental and cost economics of using renewable energy sources compared to fossil fuels.

### REFERENCE BOOKS

- R1. B H Khan "Non-Conventional Energy Resources", Third Edition, Tata McGraw-Hill, 2007
- R2. P K Nag, "Power plant Engineering", McGraw Hill Education, 2014.

### WEB RESOURCES

- |   |               |
|---|---------------|
| W1. <a href="https://prezi.com/7fugbh0ndsub/nuclear-energy-vs-hydro-energy">https://prezi.com/7fugbh0ndsub/nuclear-energy-vs-hydro-energy</a>                           | (Topic No 02) |
| W2. <a href="http://www.eolss.net/sample-chapters/c09/e4-23-02.pdf">www.eolss.net/sample-chapters/c09/e4-23-02.pdf</a>  | (Topic No 05) |
| W3. <a href="https://www.slideshare.net/vanithakakka/solar-radiation-measurement">https://www.slideshare.net/vanithakakka/solar-radiation-measurement</a>               | (Topic No07)  |
| W4. <a href="https://cleanenergyaction.files.wordpress.com-ppt">https://cleanenergyaction.files.wordpress.com-ppt</a>   | (Topic No 10) |
| W5. <a href="http://www.csun.edu/~psk17793/ES9CP/ES9%20factors_affecting_wind.htm">www.csun.edu/~psk17793/ES9CP/ES9%20factors_affecting_wind.htm</a>                    | (Topic No 11) |
| W6. <a href="https://www.slideshare.net/aslam55/biomass-conversion-technologies">https://www.slideshare.net/aslam55/biomass-conversion-technologies</a>                 | (Topic No 12) |
| W7. <a href="http://www.teriin.org/technology/biomass-gasifier">www.teriin.org/technology/biomass-gasifier</a>  | (Topic No 13) |
| W8. <a href="http://www.alternative-energy-tutorials.com">www.alternative-energy-tutorials.com</a> › Tidal Energy   | (Topic No 18) |
| W9. <a href="https://energy.gov/eere/geothermal/how-geothermal-power-plant-works-Simple">https://energy.gov/eere/geothermal/how-geothermal-power-plant-works-Simple</a> | (Topic No 26) |



Topic No	Topic	Books for Reference	Page No.	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
<b>UNIT I FOSSIL FUEL ENERGY</b> (6)						
1	Coal, Oil, Natural gas	R2	155-160	BB	1	1
2	Nuclear power and Hydro power	R2,W1	578-620	BB	1	2
3	Environmental impact of fossil fuels	R1,	9-14	BB	1	3
4	Energy scenario in India	R1	17-22	BB	1	4
5	Growth of energy sector and its planning in India.	R1, W2	23-24	BB	2	6

**LEARNING OUTCOME**

At the end of unit, students should be able to

- Analyze the resources of energy.
- Understand the energy consumption pattern.
- Identify the growth of energy sector.

**UNIT II SOLAR & WIND ENERGY - ALTERNATE SOURCE** (6)

6	Solar thermal applications	R1	91-110	BB	1	7
7	Solar thermal electric power plant	R1, W3	113-116	BB,PPT	1	8
8	Photovoltaic applications	R1	117-122	BB	1	9
9	Nature of the wind, power in the wind	R1	156-160	BB	1	10
10	Factors influencing wind, wind data and energy estimation	R1, W4	155-156	BB	1	11
11	Wind resource assessment	R1, W5	157-166	BB PPT	1	12

**LEARNING OUTCOME**

At the end of unit, students should be able to

- Analyze the solar radiation & wind resource
- Understand the concept of photovoltaic applications.
- Understands the solar and wind assessment.

**UNIT III BIO - ENERGY** (6)

12	Biomass resources and their classification	R1, W6	197-204	BB PPT	1	13
13	Direct combustion - biomass gasification	R1, W7	208-210	BB	1	14



14	Pyrolysis and liquefaction	R1	212-215	BB	2	16
15	Types of biogas Plant - applications	R1	221-223	BB	1	17
16	Urban waste to energy conversion.	R1	206-230	BB	1	18

**LEARNING OUTCOME**

At the end of unit, students should be able to

- Understand the concept of Bio power.
- Knowledge about biomass gasification.
- Knowledge about biogas plant & waste conversion.

**UNIT IV OTHER TYPES OF ENERGY****(6)**

17	Ocean energy resources - ocean thermal plant	R1	270-274	BB	2	20
18	Geothermal Energy & Geothermal power plant	R1, W8	232-244	BB, PPT	2	22
19	Fuel cell - principle of working	R1	277-292	BB, PPT	1	23
20	Various types - construction and applications	R1	293-302	BB, PPT	1	24

**LEARNING OUTCOME**

At the end of unit, students should be able to

- Understand the principle of ocean thermal energy conversion
- Knowledge about the geo thermal power plant
- Analyze the constructions of fuel cell

**UNIT V ENERGY CONVERSION & MANAGEMENT****(6)**

21	Photovoltaic conversion of solar energy	R1	117-122	BB	1	25
22	Thermo chemical conversion	R1,	117-118	BB,PPT	1	26
23	Biomass conversion processes	R1, W7	204-205	BB, PPT	1	27
24	Biochemical conversion	R1	216-220	BB	1	28
25	ocean thermal energy conversion (OTEC)	R1	260-270	BB	1	29
26	Tidal energy conversion, Industrial Management	R1, W9	250-254 -	BB, PPT	1	30

**LEARNING OUTCOME**

At the end of unit, students should be able to

- Understand the various conversion of energy resources
- Understands the need of energy management.

**COURSE OUTCOME**

At the end of the course, the students will be able to

- Understand the commercial energy and renewable energy sources.
- Knowledge about the working principle of various energy systems.
- Apply the knowledge on solar energy collectors.
- Understand the sources of Bio- energy.
- Compare different types of non renewable energy resources.

**CONTENT BEYOND THE SYLLABUS**

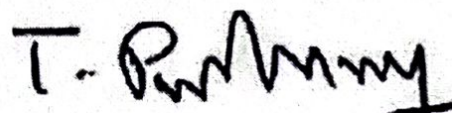
1. Nuclear energy.
2. Hydraulic energy

**INTERNAL ASSESSMENT DETAILS**

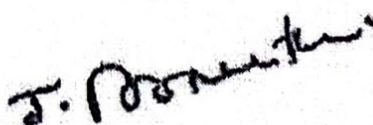
TEST NO.	I	II
Topic Nos.	1-11	12-24
Date		



Prepared by  
M.Melwin J Sridhar

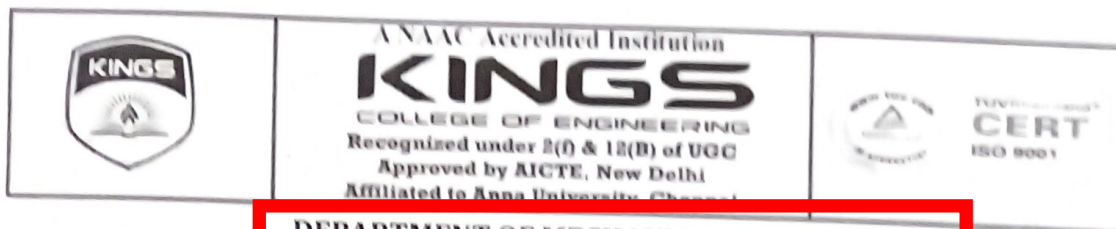


Verified By  
HOD/Mechanical



Approved by  
PRINCIPAL





**DEPARTMENT OF MECHANICAL ENGINEERING**  
**TIME TABLE (AUG2021 - NOV 2021, ODD SEM)**  
**B.E - MECH (Regulation 2017) - With Effect from 04.10.21**

Batch : 2019-2023

Year: III

Semester: V

Class room: 202

Strength: 43

Block: II

Session	1	2	11.30 am - 11.45 am	3	12.45 pm - 1.30 pm	4	5
DAY	9.30 am - 10.30 am	10.30 am - 11.30 am		11.45 am - 12.45 pm		1.30 pm - 2.30 pm	2.30 pm - 4.00 pm
MON	ME8594	OAT552	BREAK	ME8593	LUNCH BREAK	ME8501	T&P(A)
TUE	ME8595	ME8594		ME8593		ME8513	ME8511
WED	OAT552	ME8501		ME8595		ME8594	ME8593
THU	ME8594	OAT552		ME8501		ME8593	ME8512
FRI	ME8595	ME8501		ME8593		ME8594	OAT552
SAT	VAC	ME8595		T&P (SS)		GATE	NPTEL

SUB CODE	NAME OF THE SUBJECT	CATEGORY	CREDITS	NAME OF THE STAFF	DEPT	PERIODS/WEEK
TUTORIAL (T), ELECTIVE (E)						
ME8595	Thermal Engineering II	PC	3	Mr.R.Rajadurai	MECH	4
ME8593	Design of Machine Elements	PC	3	Mr.M.Sakthivel	MECH	5
ME8501	Metrology & Measurements	PC	3	Mr.R.Shankar	MECH	4
ME8594	Dynamics of Machines	PC	4	Mr.M.Melwin J Sridhar	MECH	5
OAT552	Internal Combustion Engines	OE	3	Dr.PP.Shantharaman	MECH	4
PRACTICAL (P)						
ME8511	Kinematics & Dynamics Laboratory	PC	2	Mr.S.Nelson Raja	MECH	1
ME8512	Thermal Engineering Laboratory	PC	2	Mr.R.Rajadurai	MECH	1
ME8513	Metrology and Measurements Laboratory	PC	2	Mr.M.Sakthivel	MECH	1
VALUE ADDED INITIATIVES (VAI)						
GATE	GATE coaching hour	VAI	-	Mr.S.Nelson raja	MECH	1
NPTEL	SWAYAM/NPTEL online classes	VAI	-	Mr.M.Melwin J Sridhar	MECH	1
T&P(A)	Training and Placement (Aptitude)	VAI	-	Ms.P.Suganya	T&P	1
T&P(SS)	Training and Placement (Soft Skills)	VAI	-	Dr.K.Sudhakar	T&P	1
VAC	Value Added Course	VAI	-	Mr.M.Melwin J Sridhar	MECH	1
CLASS CO-ORDINATOR		NAME OF THE REPRESENTATIVES			ROLL NO	
Mr.M.Melwin J Sridhar		R.Veeramani			38	
CLASS COMMITTEE CHAIR PERSON		Mr.M.Aswin				

DEPT. TTC  
 11/10/2021

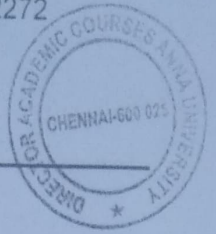
T. Prabhakaran  
 HOD 11/10/21

J. Prabhakaran  
 01/10/2021  
 PRINCIPAL



**CENTRE FOR ACADEMIC COURSES**  
**ANNA UNIVERSITY**  
CHENNAI - 600 025

Off: 22357077 / 73  
22357074  
Fax / Dir : 22352272

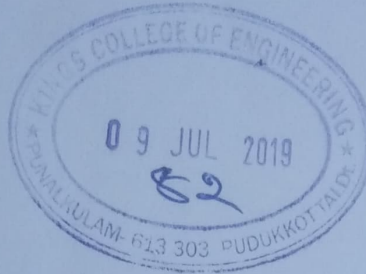


**Dr. R. RAJU**  
**DIRECTOR**

Letter No:2813/AU/VA/CAC/2019

01.07.2019

To  
The Controller of Examinations  
Anna University  
Chennai - 25.



Sir,

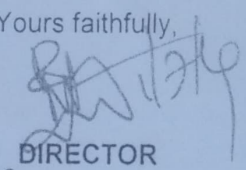
Sub : A.U. - CAC - Affiliated Institutions - Value Added Course - Reg.  
Ref : Letter No.KCE/PRL/VAC/133/19-20 dated:20.06.2019.  
\*\*\*\*\*

With reference to the letter cited, the following Value Added Course offered by Kings College of Engineering, Pudukkottai District, Affiliated Institutions is allotted the course code as detailed below.

SL.No	Code Allotted	Title
1.	MVA010	Energy Resources and Management

This is for your kind information and necessary action at your end.

Yours faithfully,

  
**DIRECTOR**

Copy to:

1. The Chairperson, Faculty of Mechanical Engineering, A.U., Ch -25.
2. The Principal, Kings College of Engineering, Punalkulam, Gandarvakottai Taluk, Pudukkottai District - 613 303.
3. The Stock File - CAC.



**AFFILIATED INSTITUTIONS**  
**FACULTY OF MECHANICAL ENGINEERING**  
**LIST OF VALUE ADDED COURSES**

SL. NO.	CODE ALLOTTED	TITLE	CREDITS
1.	MVA001	Small Unmanned Aerial Vehicle (sUAV) - Drone	2 credit ✓
2.	MVA002	3D Printing	2 credit ✓
3.	MVA003	Elements of Automation and Process Control	1 credit ✓
4.	MVA004	Geometric Dimensioning and Tolerancing	2 credit ✓
5.	MVA005	Smart Materials and Structures	2 credit ✓
6.	MVA006	Green Energy Technologies and Management	2 credit ✓
7.	MVA007	Automation Suite for Smart Systems	2 credit ✓
8.	MVA008	Internet of Things Applications in Mechanical Engineering	1 credit ✓
9.	MVA009	Surface Coating Technology	2 credit ✓
10.	MVA010	Energy Resources and Management	2 0 0 2 ✓
11.	MVA011	Modeling for Design Engineers	2 0 0 2 ✓
12.	MVA012	Basic Concept of HVAC Designing and Drafting	2 0 0 2 ✓
13.	MVA013	Robotics Process Automation	2 0 0 2 ✓
14.	MVA014	Welding and Inspection Techniques	2 0 0 2 ✓
15.	MVA015	Modern Trends in Refrigeration and Air Conditioning	2 0 0 2 ✓
16.	MVA016	Finite Element Meshing Techniques	2 0 0 2 ✓
17.	MVA017	Nanoscience and Technology	2 0 0 2 ✓
18.	MVA018	Plant Design Management System	2 0 0 2 ✓
19.	MVA019	Technology for Energy Storage	2 0 0 2 ✓
20.	MVA020	Modeling Practice for Automotive Assemblies	2 0 0 2 ✓
21.	MVA021	Modeling and Machining Practice for CNC Machines	2 0 0 2 ✓

U. H. 28/9/2020  
 DIRECTOR (CAC)



# **DEPARTMENT OF CIVIL ENGINEERING**

# **ACADEMIC YEAR**

## **2019-2020**



**DEPARTMENT OF CIVIL ENGINEERING**  
**DESIGN AND DEVELOPMENT OF CURRICULUM FOR**  
**ADD – ON COURSE (Value Added Course)**

**CVA001 & CONSTRUCTION TECHNOLOGY**

**Table of Contents**

S.No	Academic Year 2019-20
1.	Requisition letter from College to Anna University
2.	Add – On Course Syllabus
3.	Course Plan
4.	Time Table
5.	Approval letter from Anna University
6.	Anna University Approved Value added Course List – CVA001 & Construction Technology (S.No : 1)

*[Signature]*  
07/05/19  
STAFF INCHARGE

*[Signature]*  
7/5/19  
HOD/CIVIL  
**HOD**  
 Department of Civil Engineering  
 Kings College of Engineering

*[Signature]*  
07/05/2019  
PRINCIPAL  
**PRINCIPAL**  
 Kings College of Engineering  
 PUNALKULAM - 613 303.



Dr. J. Arputha Vijaya Selvi, M.E., Ph.D.,  
**PRINCIPAL**

Ref: KCE / PRL / VAC/106/18-19

07.05.2019

To

The Director,  
Center for Academic Courses,  
Anna University,  
Chennai - 25.

Respected Sir,

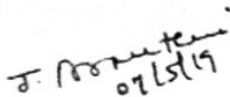
Sub: Requisition for approving the Value Added Course on **Construction Technology**  
for the batch of 2017 - 2021 -reg

As per the AU Regulation 2017, the Civil Engineering department of our college has planned to conduct the Value Added Course with 2 credits on the topic of Construction Technology for the batch 2017 -2021 having the strength of 38 students.

In this regard, we seek your consent to conduct the same value added course during the current academic year **(2019 -2020 Odd Semester).**

Thanking You,

Regards,

  
07/05/19

PRINCIPAL  
PRINCIPAL  
Kings College of Engineering  
Punalkulam- 613 303.



Encl:

- i) Copy of the Syllabus
- ii) Copy of the Timetable

**CE501**

**CONSTRUCTION TECHNOLOGY**

**L T P C**  
**2 0 0 2**

**UNIT I      STANDARD METHODS OF MEASUREMENTS AND UNITS      8**

System of units-Fundamental & Derived units-conversion of units -Civil engineering measurements- Measurements of materials and works-Accuracy of results.

**UNIT II      BUILDING PLANNING      8**

Building plan-Specifications-Drawing- Building bye laws and Regulations

**UNIT III ESTIMATION-ABSTRACT AND DETAILING      8**

Types of Estimates-Detail & Abstract Estimates of Buildings- Analysis of Rates-Estimation of Quantities of Steel & RCC Elements-Earthwork calculations-Detailed estimate.

**UNIT IV      STRUCTURAL ELEMENTS      8**

Materials for Reinforced Concrete-Bar Bending-Sheet centering-Scaffolding.

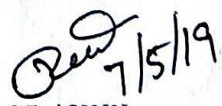
**UNIT V      FIELD/SITE WORK/CONSTRUCTION ACTIVITIES      8**

Site marking-Foundation-Plinth Beam-Components of building

**TOTAL : 40 PERIODS**



**STAFF INCHARGE**  
**(Ms.K.JEYASHANKARI)**



**HOD/CIVIL**  
**(Mrs.R.REVATHI)**



## DEPARTMENT OF CIVIL ENGINEERING COURSE PLAN

<b>Sub. Code</b> : CE501	<b>Branch/Year/Sem</b> : B.E CIVIL /III/V
<b>SubName</b> : Construction Technology	<b>Batch</b> : 2017-2021
<b>Staff Name</b> : Ms.K.Jeyashankari	<b>Academic Year</b> :2019-2020 (ODD)

### COURSE OBJECTIVE

Students will be able to:

- To learn the fundamental units of materials used in construction.
- To know the specifications used for building planning.
- To learn the abstract Estimates of Buildings
- To understand the effect of bar bending in reinforced concrete.
- To know the field work in construction
- To know and understand the general construction processes and their sequences

### TEXTBOOKS:

**T1.** N.Mathankumar, “Estimating and Quantity Surveying”,ARS Publications, Chennai 2018

**T2.** G.S.Birdie and T.D.Ahuja., “Building Construction and Construction materials”, Dhanpat Rai Publishing Company, 4th edition, New Delhi,2007.

### REFERENCES:

**R1.**Karthikeyan.N,V.Soundararajan, K.Chandrasekar,“Construction Materials”, ARS Publications, Chennai, 2015.

**R2.**Bhavikatti.S.S, “Building Materials”, Vikas Publishing House Pvt Ltd,2015.

### WEB RESOURCES

- W1.** <https://www.slideshare.net/mrmartella/standards-of-measurement-presentation> (Topic.No:01)
- W2.** <https://www.slideshare.net/RCNandish/bye-laws> (Topic.No:10)
- W3.** <https://nptel.ac.in/courses/105104161/8> (Topic.No:12)
- W4.** <https://nptel.ac.in/courses/105102088/2> (Topic.No:17)
- W5.** <https://nptel.ac.in/courses/105102088/> (Topic.No:20)



Topic No	Topic	Books for Reference	Page No.	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
<b>UNIT I STANDARD METHODS OF MEASUREMENTS AND UNITS</b>					<b>8</b>	
01	System of units	T1 W1	1.8	BB PPT	1	1
02	Fundamental & Derived units	T1	1.8	BB	1	2
03	Conversion of units	T1	1.8	BB	1	3
04	Civil engineering measurements	T1 R1	1.11 17,35	BB	1	4
05	Measurements of materials and works	T1	95-112	BB	2	6
06	Accuracy of results	T1	1.10	BB	2	8
<b>LEARNING OUTCOME</b> At the end of this unit, students will be able to <ul style="list-style-type: none"> <li>Learn about the Fundamental &amp; Derived units</li> <li>Understand the Civil engineering measurements</li> </ul>						
<b>UNIT II BUILDING PLANNING</b>					<b>8</b>	
7	Building plan	T2 R2	26.489 1.1	BB	2	10
8	Specifications	T1 T2	3.16-3.37 21.435- 21.449	BB	2	12
9	Drawing	T2	26.491- 26.502	BB	2	14
10	Building bye laws and Regulations	T2 W2	26.493	BB PPT	2	16
<b>LEARNING OUTCOME</b> At the end of this unit, students will be able to <ul style="list-style-type: none"> <li>Draw the Building plan</li> <li>Study the building regulations</li> </ul>						
<b>UNIT III ESTIMATION-ABSTRACT AND DETAILING</b>					<b>8</b>	
11	Types of Estimates	T1	1.3	BB	1	17
12	Detail & Abstract Estimates of Buildings	T1 W3	1.5-1.6	BB NPTEL	1	18
13	Analysis of Rates	T1 T2	3.4-3.9 21.439	BB	1	19
14	Estimation of Quantities of Steel & RCC Elements	T1	1.12-1.16	BB	1	20
15	Earthwork calculations	T1 R1	2.42 126	BB	2	22
16	Detailed estimate	T1	1.7-1.88	BB	2	24

Topic No	Topic	Books for Reference	Page No.	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
<b>LEARNING OUTCOME</b> At the end of this unit, students will be able to <ul style="list-style-type: none"> <li>Study the analysis of rates</li> <li>Understand the Earthwork calculations</li> </ul>						
<b>UNIT IV STRUCTURAL ELEMENTS</b>					<b>8</b>	
17	Materials for Reinforced Concrete	T2 R1 W4	18.348 95-115	BB NPTEL	2	26
18	Bar Bending	T2 R2	18.350 4.20	PPT	2	28
19	Sheet centering	T2	7.178	BB	2	30
20	Scaffolding	T2 W5	7.172	NPTEL	2	32
<b>LEARNING OUTCOME</b> At the end of this unit, students will be able to <ul style="list-style-type: none"> <li>Know the materials required for Reinforced Concrete</li> <li>Understand the requirement of bar bending and Sheet centering</li> </ul>						
<b>UNIT V FIELD/SITE WORK/CONSTRUCTION ACTIVITIES</b>					<b>8</b>	
21	Site marking	T2	2.13-2.14	On site	2	34
22	Foundation	T2 R2	3.2-3.5 4.2	On site	2	36
23	Plinth Beam	T2	3.69	On site	2	38
24	Components of building	T2	8.185 9.217 10.235 11.248 12.266	On site	2	40
<b>LEARNING OUTCOME</b> At the end of this unit, students will be able to <ul style="list-style-type: none"> <li>Do the Site marking in Construction</li> <li>Know the reinforcement detailing in Foundation</li> </ul>						

### COURSE OUTCOME

At the end of the course, the students will be able to

- To understand the knowledge of planning and construction
- Learn the building bye laws and regulations
- Know the sustainable concept in constructions
- Understand the concept of doing scaffolding in construction site

**CONTENT BEYOND THE SYLLABUS**

- Study of building construction in India.

**INTERNAL ASSESMENT DETAILS**

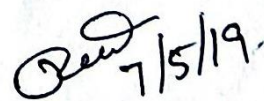
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TOPIC	1-14	15-24
DATE		

**ASSIGNMENT DETAILS**

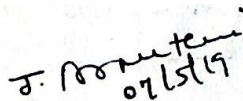
ASSIGNMENT	I	II
Topic Nos/Activity	1-14	PCE
Date		



Prepared by  
**Ms.K.JEYASHANKARI**  
**AP/CIVIL**



Verified By  
**HOD/CIVIL**



Approved by  
**PRINCIPAL**  
**PRINCIPAL**  
**Kings College of Engineering**  
**Punalkulam- 613 303.**





**DEPARTMENT OF CIVIL ENGINEERING**  
**ACADEMIC YEAR 2019-2020 ODD SEM**

**Batch: 2017-2021**

**Year/semester: III/V**

Session	1	2	3	12:30-1:30 A.M	4	5	6
DAY	09:30-10.30 A.M	10:30-11.30 A.M	11:30-12.30 A.M		01:30-2.30 A.M	02:30-03.30 A.M	03:30-04.30 A.M
SAT	CE501-construction technology			Lunch break			

SUB CODE	NAME OF THE SUBJECT	CREDITS	NAME OF THE STAFF	DEPT	PERIODS /WEEK
CE501	Construction Technology	2	Ms.K.Jeyasankari	CE	3

*[Signature]*  
7/5/19.

**HOD/CIVIL**

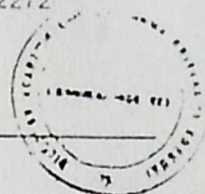
*[Signature]*  
07/5/19

**PRINCIPAL**



CENTRE FOR ACADEMIC COURSES  
ANNA UNIVERSITY  
CHENNAI - 600 075

Off 22357077 / 73  
22357074  
Fax / Dir 22352272

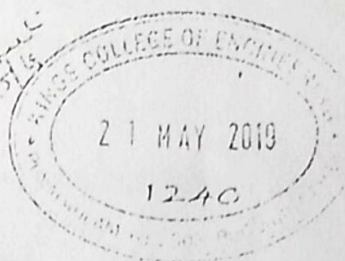


Dr. R. RAJU  
DIRECTOR  
Letter No.2359/AU/VA/CAC/2019

copy to HOD (Civil)  
21/5/19

15 05 2019

To  
The Controller of Examinations  
Anna University  
Chennai - 25



Sir,

Sub: A U. - CAC - Affiliated Institutions - Value Added Course - Reg.  
Ref: Letter No.KCE/PRL/VAC/106/18-19, dated:07.05.2019.

With reference to the letter cited above, the following Value Added Course offered by Kings College of Engineering, Pudukkottai, Affiliated Institutions is allotted the course code as detailed below.

S.No	Code Allotted	Title
1	CVA001	Construction Technology

This is for your kind information and necessary action at your end.

Yours faithfully,

*[Signature]*  
16/5/19

DIRECTOR

Copy to:

1. The Chairperson, Faculty of Civil Engineering, Anna University, Chennai - 25.
2. The Principal, Kings College of Engineering, Punalikulam, Gandarvakottai Taluk, Pudukkottai District, Tamilnadu - 613 303.
3. The Stock File

**AFFILIATED INSTITUTIONS**  
**FACULTY OF CIVIL ENGINEERING**  
**APPROVED LIST OF VALUE ADDED COURSES**

Sl. No	Code	Subject name	L	T	P	C
1.	CVA001	Construction Technology	2	0	0	2
2.	CVA002	Integrated Structural Engineering of Building Structures	1	0	0	1
3.	CVA003	Computational Fluid Dynamics	1	0	0	1
4.	CVA004	AUTOCAD	1	0	2	2
5.	CVA005	Structural Analysis and Design	1	0	2	2
6.	CVA006	Civil Engineering Drawing and Bar Bending Schedule	2	0	0	2
7.	CVA007	Project Planning and Management	1	0	2	2
8.	CVA008	Interior Decoration	1	0	0	1
9.	CVA009	Vaasthu and Building Plan	1	0	0	1
10.	CVA010	3D's MAX	2	0	0	2
11.	CVA011	STAAD Pro Design Software	1	0	0	1
12.	CVA012	STAAD Pro V8i	1	0	2	2
13.	CVA013	STAAD Pro V8i Series 4	1	0	2	2
14.	CVA014	Primavera (P6) Project Management	1	0	0	1
15.	CVA015	Safety Aspects in Construction	2	0	0	2
16.	CVA016	3D Building Design Using Revit Architecture	2	0	0	2
17.	CVA017	Computer Applications in Civil Engineering	2	0	0	2
18.	CVA018	Industrial Waste Management	2	0	0	2
19.	CVA019	Professional Practices in Civil Engineering Construction	2	0	0	2
20.	CVA020	3D Printing Technology for Civil Engineering	1	0	0	1
21.	CVA021	Building Modeling Using 3D Revit Architecture	2	0	0	2
22.	CVA022	Project Scheduling with Primavera P6	2	0	0	2
23.	CVA023	E Tabs Software	0	0	2	1
24.	CVA024	Geospatial Mapping	0	0	2	1
25.	CVA025	Modern Equipments and Its Applications	2	0	0	2



26.	CVA026	Advanced Field Surveying	0	0	2	1
27.	CVA027	Model Generation and Static Analysis of Structures	0	0	2	1
28.	CVA028	Recent Trends in Design and Detailing of Structures	0	0	2	1
29.	CVA029	Design and Systematic Analysis of Civil Structures	2	0	0	2
30.	CVA030	Building Information Modeling and MS Project	2	0	0	2
31.	CVA031	Fire Protection, Services and Maintenance Management of Building	2	0	0	2

*U. J. J.*  
26/9/2020

DIRECTOR  
CENTRE FOR ACADEMIC COURSES

*U. J. J.*  
23/9/2022

**DEPARTMENT OF  
COMPUTER SCIENCE  
AND ENGINEERING**

**ACADEMIC**

**YEAR**

**2019-2020**






## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### DESIGN AND DEVELOPMENT OF CURRICULUM FOR ADD-ON COURSE (VALUE ADDED COURSE)

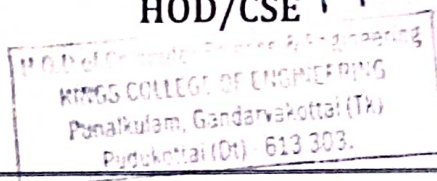
**IVA005 – VB.NET**


### Table of Contents

S.No	ACADEMIC YEAR 2019-2020
1	Requisition Letter from college to Anna University
2	Add-On Course Syllabus
3	Course Plan
4	Time Table
5	Approval Letter from Anna University
6	Anna University Approved Value Added Course List IVA005 VB.NET listed at Anna University Website S.No : 5

  
 8/11/20  
**Course Co-ordinator**

  
 8/11/20  
**HOD/CSE**



  
 08/11/2020

**PRINCIPAL**  
**PRINCIPAL**  
**Kings College of Engineering**  
**PUNALKULAM - 613 303.**

Dr. J. Arputha Vijaya Selvi, M.E., Ph.D.,  
PRINCIPAL

Ref: KCE / PRL / VAC/115/18-19

22.05.2019

To  
The Director,  
Center for Academic Courses  
Anna University,  
Chennai – 25.

Respected Sir/Mam,

Sub: Requisition for approving the Value Added Course on VB.NET for the batch of  
2017 – 2021 -reg

As per the AU Regulation 2017, the CSE department of our college has planned to conduct the Value Added Course with 2 credits on the topic of VB.NET for the batch 2017 -2021 having the strength of 47 students. Herewith the syllabus, course plan, schedule and the staff details are enclosed. We request you to kindly approve organizing the course and its syllabus. With your consent we will organize the course during the vacation of current academic session (2019 -2020 Odd Semester). Thank You.

Yours faithfully,

  
(J.Arputha Vijaya Selvi)

Principal

Encl:

- i) Syllabus
- ii) Course Plan
- iii) Course Schedule & Staff details

**PRINCIPAL**  
Kings College of Engineering  
Punalkulam- 613 303.

Copy to: The Controller of Examinations, Anna University, Chennai – 25.



## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### VALUE ADDED COURSE

**SUB NAME: VB.NET**

**YEAR / SEMESTER: III / V**

**PREPARED BY,  
R.SUGANTHA LAKSHMI / CSE  
G.CHANDRA PRABA / CSE**





## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### SYLLABUS

#### VB.NET

**L T P C**  
**1 0 2 2**

#### **UNIT I VISUAL BASIC .NET AND THE .NET FRAMEWORK 9**

Introduction to .net framework -Features, Common Language Runtime (CLR) ,Framework Class Library(FCL).Visual Studio.Net – IDE, Languages Supported, Components. Visual Programming, VB.net - Features, IDE- Menu System, Toolbars, Code Designer, Solution Explorer, Object Browser, Toolbox, Class View Window, Properties Window, Server Explorer, Task List, Output Window, Command Window.

#### **UNIT II ELEMENTS OF VISUAL BASIC .NET 9**

Properties, Events and Methods of Form, Label, TextBox, ListBox, Combo Box, RadioButton, Button, Check Box, Progress Bar, Date Time Picker, Calendar, Picture Box, HScrollbar, VScrollbar, Group Box, ToolTip,Timer.

#### **UNIT III PROGRAMMING IN VISUAL BASIC .NET 9**

Data Types, Keywords, Declaring Variables and Constants, Operators, Understanding Scope and accessibility of variables, Conditional Statements- If- Then, If-Then-Else, Nested If, Select Case, Looping Statement- Do loop, For Loop, For Each-Next Loop, While Loop, Arrays- Static and Dynamic.

#### **UNIT IV FUNCTIONS, BUILT-IN DIALOG BOXES, MENUS AND TOOLBAR 9**

Menus and toolbars- Menu Strip, Tool Strip, Status Strip, Built-In Dialog Boxes –Open File Dialogs, Save File Dialogs, Font Dialogs, Color Dialogs, Print Dialogs, InputBox, Msg Box, Interfacing With End user- Creating MDI Parent and Child, Functions and Procedures- Built-In Functions- Mathematical and String Functions, User Defined Functions and Procedures.

#### **UNIT V ADVANCED CONCEPTS IN VB.NET 9**

Object Oriented Programming- Creating Classes , Objects, Fields, Properties, Methods, Events , Constructors and destructors, Exception Handling- Models, Statements, Data Access withADO.Net , Data Access with ServerExplorer, Data Adapter and DataSets, ADO.NET Objects and Basic SQL.

**Note:** Hands-on sessions with the objective of one application development.

**Total : 45 periods**



## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### COURSE PLAN

<b>Sub.Name</b> : VB.NET	<b>Branch / Year / Sem</b> : CSE / III / V
<b>Academic Year</b> : 2019-20 (ODD)	<b>Batch</b> : 2017-2021
<b>Staff Name</b> : Mrs R.Sugantha Lakshmi & Mrs.G.Chandra Praba	

### Course objectives

- Learn the fundamentals of VB.NET
- Understand the elements of VB.NET
- Learn the programming concepts and develop applications on VB.NET.
- Make the students aware of data access

### Books Recommended for Reading and Reference:

1. Visual Basic.Net Programming Black Book by Steven Holzner, Dreamtech Press
2. The Complete Reference Visual Basic .NET by Jeffrey R. Shapiro ,Tata McGraw Hills.
3. Murach's Beginning Visual basic .Net By Anne Prince, BPB Publications

### Web Resources

1. [https://www.oreilly.com/library/view/programming-visual basic/0596000936](https://www.oreilly.com/library/view/programming-visual-basic/0596000936)
2. [https://udemy.com/visual-basic-net-step-by-step for beginners](https://udemy.com/visual-basic-net-step-by-step-for-beginners)
3. [https:// www.freevbcode/vb-net-asp-net](https://www.freevbcode.com/vb-net-asp-net)
4. [https:// www.codeproject.com/kb/vb](https://www.codeproject.com/kb/vb)
5. [https:// www.tutorialspoint.com/vb.net](https://www.tutorialspoint.com/vb.net)

S.No	Topics	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
UNIT I		VISUAL BASIC .NET AND THE .NET FRAMEWORK		9
1.	Introduction to .net framework -Features, Common Language Runtime (CLR), Framework Class Library(FCL).	BB	2	2
2.	Visual Studio.Net – IDE, Languages Supported, Components.	BB	1	3
3.	Visual Programming, VB.net - Features, IDE-Menu System, Toolbars, Code Designer, Solution Explorer, Object Browser	PPT	1	4
		Hands-on-session	2	6
4.	Toolbox, Class View Window, Properties Window, Server Explorer, Task List, Output Window, Command Window.	PPT	1	7
		Hands-on-session	2	9
UNIT II		ELEMENTS OF VISUAL BASIC .NET		9
5.	Properties, Events and Methods of Form	PPT	1	10
		Hands-on-session	2	12
6.	Label, TextBox, ListBox, Combo Box, RadioButton, Button, Check Box	PPT	1	13
		Hands-on-session	2	15
7.	Progress Bar, Date Time Picker, Calendar, Picture Box, HScrollbar, VScrollBar, Group Box, ToolTip,Timer.	PPT	1	16
		Hands-on-session	2	18
UNIT III		PROGRAMMING IN VISUAL BASIC .NET		9
8.	Data Types, Keywords, Declaring Variables and Constants, Operators, Understanding Scope and accessibility of variables	PPT	1	19
		Hands-on-session	2	21
9.	Conditional Statements- If- Then, If-Then-Else, Nested If, Select Case	PPT	1	22
		Hands-on-session	2	24
10.	Looping Statement- Do loop, For Loop, For Each-Next Loop, While Loop, Arrays- Static and Dynamic.	PPT	1	25
		Hands-on-session	2	27



S.No	Topics	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
UNIT IV FUNCTIONS, BUILT-IN DIALOG BOXES, MENUS AND TOOLBAR				9
11.	Menus and toolbars- Menu Strip, Tool Strip, Status Strip - Built-In Dialog Boxes -Open File Dialogs, Save File Dialogs, Font Dialogs, Color Dialogs, Print Dialogs	PPT	1	28
		Hands-on-session	2	30
12.	InputBox, Msg Box, Interfacing With End user, Creating MDI Parent and Child	PPT	1	31
		Hands-on-session	2	33
13.	Functions and Procedures- Built-In Functions- Mathematical and String Functions - User Defined Functions and Procedures.	PPT	1	34
		Hands-on-session	2	36
UNIT V ADVANCED CONCEPTS IN VB.NET				9
14.	Object Oriented Programming- Creating Classes , Objects, Fields, Properties, Methods, Events - Constructors and destructors, Exception Handling- Models, Statements	PPT	1	37
		Hands-on-session	2	39
15.	Data Access with ADO.Net , Data Access with ServerExplorer , Data Adapter and DataSet	PPT	1	40
		Hands-on-session	2	42
16.	ADO.NET Objects and Basic SQL.	PPT	1	43
		Hands-on-session	2	45

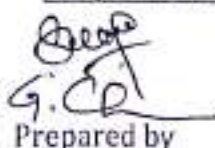
**Course Outcome**

Upon the completion of the course, the students are able to

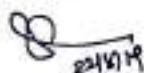
- Describe the basic concepts of VB.NET
- Work on VB.NET IDE
- Develop simple applications
- Create applications using MDI
- Access datasets and databases

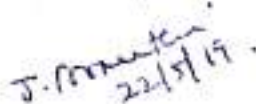
**INTERNAL ASSESSMENT DETAILS**

TEST NO.	I	II
Topic Nos.	1-10	11-16

  
Prepared by

Ms. R.Sugantha Lakshmi  
Ms.G.Chandra Praba

  
22/5/19

  
22/5/19

Approved by **PRINCIPAL**  
**PRINCIPAL** College of Engineering  
Punakulam- 613 303.

  
Verified By  
HOD/CSE



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING  
**TIME TABLE (2019 - 2020 ODD SEM)**

B.E - CSE (Regulation 2017)

Batch:2017-2021

Strength:47

Year: III Semester: V Class Room : 222 Block: II

Session	1	2	10.45 am - 11.00 am	3	4	12.30 pm - 01.10 pm	5	6	7	03.25 pm - 03.40 pm	8
Day	09.15am - 10.00am	10.00am - 10.45am		11.00am - 11.45am	11.45am - 12.30p m		01.10pm - 01.55pm	01.55pm - 02.40pm	02.40pm - 03.25pm		03.40pm - 04.30pm
MON	VAC	VAC	BREAK	VAC	VAC	LUNCH BREAK				BREAK	-
TUE	VAC	VAC		VAC	VAC						-
WED	VAC	VAC		VAC	VAC						-
THU	VAC	VAC		VAC	VAC						-
FRI	VAC	VAC		VAC	VAC						-

SUB CODE	NAME OF THE SUBJECT	NAME OF THE STAFF	DEPT	PERIODS/WEEK
VAC	VB.NET	Ms.R.SuganthaLakshmi(8211008) & Ms.G.Chandrapraba(8211212)	CSE	20

  
HOD

  
PRINCIPAL  
PRINCIPAL  
Kings College of Engineering  
Punakulam - 613 303





**CENTRE FOR ACADEMIC COURSES**  
ANNA UNIVERSITY  
CHENNAI - 600 025

Off. 22357077 / 73  
22357074  
Fax / Dir 22352272



**Dr. R. RAJU**  
**DIRECTOR**

Letter No:2521/AU/VA/CAC/2019



To  
The Controller of Examinations  
Anna University  
Chennai - 25.

Sir,

Sub : A.U. - CAC - Affiliated Institutions - Value Added Course - Reg.  
Ref : Letter No.KCE/PRL/VAC/115/18-19, dated 22.05.2019.

\*\*\*\*\*

With reference to the letter cited above, the following Value Added Course offered by Kings College of Engineering, Affiliated Institutions is allotted the course code as detailed below.

SI.NO	CODE ALLOTTED	TITLE
1.	IVA005	VB.NET

This is for your kind information and necessary action at your end.

Yours faithfully,

*(Signature)*  
30/05/19  
**DIRECTOR**

**Copy to:**

1. The Chairperson, Faculty of Information and Communication Engineering, A.U., CH-25.
2. The Principal, Kings College of Engineering, Punalkulam, Gandarvakottai Taluk, Pudukkottai District - 613 303
3. The Stock File



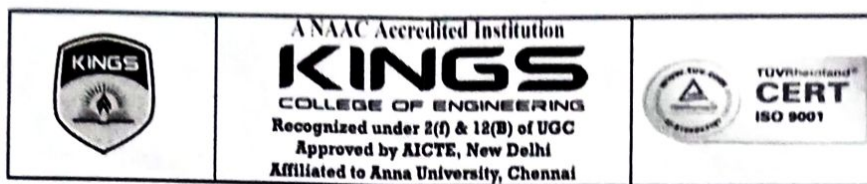
**AFFILIATED INSTITUTIONS  
FACULTY OF INFORMATION AND COMMUNICATION ENGINEERING  
LIST OF VALUE ADDED COURSES**

S. NO	CODE ALLOTTED	COURSE TITLE	CREDITS				
			L	T	P	C	
1.	IVA001	Design Thinking	1	0	1	2	
2.	IVA002	PCB Design, Embedded System Interfacing with Arduino & Robotics	1	0	1	2	
3.	IVA003	Interactive Web Designing and Progressive Java	1	0	1	2	
4.	IVA004	Robotics and its Applications	1	0	1	2	
5.	IVA005	VB.NET	1	0	2	2	
6.	IVA006	Enterprise Application Development and Deployment on Cloud using IBM Bluemix	0	0	2	1	
7.	IVA007	Predictive Modeling using IBM SPSS Modeler	0	0	2	1	
8.	IVA008	Enterprise Mobile Application Development using IBM Worklight	0	0	2	1	
9.	IVA009	iOS App Development	0	0	2	1	
10.	IVA010	Transfer Learning Frameworks	0	0	2	1	
11.	IVA011	Data Science with Python	1	0	1	2	
12.	IVA012	Internet of Things with Node MCU	0	0	2	1	
13.	IVA013	Virtual Instrumentation	1	0	1	2	
14.	IVA014	IC Test Engineering	1	0	1	2	
15.	IVA015	Learning C	1	0	1	2	
16.	IVA016	Internet of Things Using Broadcom BCM2837	1	0	1	2	
17.	IVA017	PHP and MYSQL	0	0	2	1	
18.	IVA018	Advanced Python and Introduction to Machine Learning	0	0	2	1	
19.	IVA019	Real Time Electronics System Design	1	0	1	2	
20.	IVA020	Case Study – Operating System Design	0	0	2	1	
21.	IVA021	Case Study – Network Design	0	0	2	1	
22.	IVA022	Electronic Circuits Making and PCB Design	0	0	2	1	
23.	IVA023	Data Mining Laboratory	0	0	2	1	
24.	IVA024	Multimedia Laboratory	0	0	2	1	
25.	IVA025	Visual Basic Laboratory	0	0	2	1	
26.	IVA026	Advanced Java Programming	1	0	1	2	
27.	IVA027	Website Blog Design	0	0	2	1	
28.	IVA028	Virtual Instrumentation Using Lab View	1	0	1	2	
29.	IVA029	Angular J S	0	0	2	1	
30.	IVA030	Simulation and Analysis of Networks Using Software (NS-2)	0	0	2	1	
31.	IVA031	The Ruby Programming Language	0	0	2	1	
32.	IVA032	VB.Net Programming	0	0	2	1	

**DEPARTMENT OF  
ELECTRONICS AND  
COMMUNICATION  
ENGINEERING**

**ACADEMIC  
YEAR  
2019 - 2020**





## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

### DESIGN AND DEVELOPMENT OF CURRICULUM FOR ADD – ON COURSE (Value Added Course)


### IVA019 & Real Time Electronics and System Design

#### Table of Contents

Academic Year 2019-20	
1.	Requisition Letter From College to Anna University
2.	Add – On Course Syllabus
3.	Course Plan
4.	Time Table
5.	Approval Letter From Anna University
6.	Anna University Approved Value Added Course List – IVA019 & Real Time Electronics and System Design listed at University Website S.No : 19

  
Course Coordinator

  
HoD/ECE  
**H.O.D.**  
ELECTRONICS AND COMMUNICATION ENGINEERING  
**KINGS COLLEGE OF ENGINEERING**  
PUNALKULAM - 613 303.  
GANDARYAKOTTAI TALUK, PUDUKOTTAI DISTRICT

  
Principal  
**PRINCIPAL**  
Kings College of Engineering  
PUNALKULAM - 613 303



Dr. J. Arputha Vijaya Selvi, M.E., Ph.D.,  
**PRINCIPAL**

Ref: KCE / PRL / VAC/125/18-19

10.06.2019

To  
The Director  
Center for Academic Courses  
Anna University, Chennai

Respected Sir,

Sub: Submission of modified syllabus and course plan for the approval of  
Value Added Course on "Real time Electronics System Design" for  
the batch of 2017 - 2021 -reg

Ref. Letter No.2520/AU/CAC/FICE/2019

With reference to your letter dated 31.5.2019, the syllabus of Value added course titled "Real Time Electronics System Design" has been modified and the practical session is included in the course plan. Further it is planned to handle this course as practical oriented course. Herewith the modified syllabus and course plan are enclosed for your kind perusal and approval.

Thank You,

Yours faithfully,

*J. Arputha Selvi*  
10/6/19

**PRINCIPAL**  
Kings College of Engineering  
Punalkulam - 613 303.



Encl:

- i) Syllabus(modified)
- ii) Course Plan(modified)
- iii) Time Table

## SYLLABUS

EC851

REAL TIME ELECTRONICS SYSTEM DESIGN

L T P C

2 0 1 2

**UNIT I REAL TIME ELECTRONICS SYSTEM COMPONENTS****6**

Introduction-Functional components of real time electronics system-Analog IO devices-Digital IO devices-Processor -Memory devices -Communication modules.

**UNIT II PROGRAMMING REAL TIME EMBEDDED COMPUTING SYSTEM****6**

Integrated development environment(IDE) for 8051 micro controller- programming of 8051 microcontroller using keil software tools and IDE-Overview of embedded C programming- Constants, Variables and data types- Operators and expressions- Loops-arrays- Strings- User defined function-structures- pointers - Compiling, Assembling, Linking and Debugging.

**UNIT III IO DEVICES -INTERFACING AND PROGRAMMING****6**

8051 Microcontroller Architecture-Interfacing and programming of IO devices- LED, LCD, seven segment display, switch, Buzzer, Relay, ADC and DAC, Temperature sensor, Humidity sensor, Ultrasonic sensor, Infrared sensor, Accelerometer, stepper motor and dc motor.

**UNIT IV PROGRAMMING OF WIRELESS COMMUNICATION MODULES****6**

Wireless technology for industrial and control applications - Development and implementation of wireless communication using Zigbee, Bluetooth, LiFi, and Wi-Fi. Development and Implementation of wireless control using GSM and GPS.

**UNIT V REAL TIME SYSTEM APPLICATION EXAMPLES****6**

Automatic Irrigation System -Real time air pollution monitoring system using GSM and GPS-LPG gas leakage and fire alert safety system-Camera based anti theft security system-Remote wireless control of electrical and electronics home appliances/industrial machines- Smart watch for heart rate and BP monitoring.

**TOTAL: 30 PERIODS**

*Jeyaseelan.T*  
Staff in-charge  
JEYASEELAN.T

*[Signature]*  
HOD/ ECE





**KINGS**  
COLLEGE OF ENGINEERING  
(NAAC Accredited Institution)  
(Approved by AICTE, New Delhi Affiliated to  
Anna University, Chennai)



TÜVRheinland  
**CERT**  
ISO 9001

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**VALUE ADDED COURSE**

**SUBJECT: REAL TIME ELECTRONICS SYSTEM DESIGN**

**SEMESTER: V**

**COURSE PLAN (EC 851)**

***(Version: 1)***

**PREPARED BY**

**Mr. T. JEYASEELAN AP/ECE**



**KINGS**  
COLLEGE OF ENGINEERING  
(N.A.A.C. Accredited Institution)  
(Approved by AICTE, New Delhi. Affiliated to  
Anna University, Chennai)



## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

### COURSE PLAN

Sub. Code : EC851	Branch / Year / Sem : B.E ECE / III / V
Sub. Name : Real Time electronics system design	Batch : 2017-2021
Staff Name : Mr.T.Jeyaseelan	Academic Year : 2019 - 20 (ODD)

### COURSE OBJECTIVE

- To make the students to apply fundamental concepts in Electronics systems for providing solutions for real-time system design.
- To provide practical experience to the students on interfacing of Input-Output devices, communication devices with the processor.
- To introduce the basic concepts in Hardware and software design.
- To practice the students in order to implement electronics system for the real time applications

### TEXT BOOKS

- T1. "Real-Time Systems Design Principles for Distributed Embedded Applications", Hermann Kopetz, Kluwer Academic Publishers.
- T2. "The 8051 Microcontroller Architecture, Programming and Applications", Kenneth J. Ayala, THOMSON Learning.

### REFERENCE BOOKS

- R1. "Embedded C", Michael J. Pont, Pearson Education.
- R2. "Sensors and Transducers", Ian R. Sinclair, Third edition, Newnes.
- R3. "8051 Micro controller An applications based Introducton" David Calcutt, Fred Cowan Hassan Parchizadeh, Elsevier.
- R4. "C Programming for Embedded Systems", Kirk zurell, R&D books, CMP media, Inc, USA.

### WEB RESOURCES

- W1. <https://nptel.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Embedded%20systems/Pdf/Lesson-3.pdf> (Topic No. 01, 05, 06)
- W2. [http://www.eng.auburn.edu/~nelson/courses/elec3040\\_3050/C%20programming%20for%20embedded%20system%20applications.pdf](http://www.eng.auburn.edu/~nelson/courses/elec3040_3050/C%20programming%20for%20embedded%20system%20applications.pdf) (Topic No. 09, 10, 11)
- W3. <https://cs.wmich.edu/alfuqaha/spring15/cs6570/lectures/PHY-MAC-Bluetooth-ZigBee-rev2.pdf> (Topic No. 19)
- W4. [https://www.electronics-tutorials.ws/io/io\\_7.html](https://www.electronics-tutorials.ws/io/io_7.html) (Topic No. 18)
- W5. <https://www.engineersgarage.com/microcontroller/8051projects> (Topic No. 20-30)

Topic No	Topic	Books for Reference	Page No.	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
<b>UNIT I REAL TIME ELECTRONICS SYSTEM COMPONENTS (6)</b>						
1.	Introduction	T1 W1	1-8	PPT	1	1
2.	Functional components of real time electronics system	T1	30-35	PPT	1	2
3.	Analog IO devices	R2	87-115	PPT	1	3
4.	Digital IO devices	R2	37-40	PPT	2	5
5.	Processor, Memory devices	W1,R3	10-11	PPT		
6.	Communication modules	W1		PPT	1	6
<b>LEARNING OUTCOME</b> At the end of unit, students will be able to <ul style="list-style-type: none"> <li>Know the functional components of Real time electronic system.</li> <li>Understand the concept and architecture of real-time system.</li> </ul>						
<b>UNIT II PROGRAMMING REAL TIME EMBEDDED COMPUTING SYSTEM (6)</b>						
7.	Integrated development environment(IDE) for 8051 micro controller	R1	36-37	PPT	2	8
8.	Programming of 8051 microcontroller using keil software tools and IDE	R1	38-40	Practical		
9.	Overview of embedded C programming- Constants, Variables and data types- Operators and expressions	R4, W2	60-63	Practical	1	9
10.	Loops-arrays- Strings	R4, W2	64	Practical	1	10
11.	User defined function- structures- pointers	R4 W2	63,66	Practical	1	11
12.	Compiling, Assembling, Linking and Debugging.	R1	43-45	Practical	1	12
<b>LEARNING OUTCOME</b> At the end of unit, students will be able to <ul style="list-style-type: none"> <li>Know the basics of embedded C programming and its use in application development.</li> <li>Develop an embedded C program for a typical electronic application.</li> </ul>						
<b>UNIT III IO DEVICES -INTERFACING AND PROGRAMMING (6)</b>						
13.	8051 Microcontroller Architecture	T2	11-22	PPT	1	13
14.	Interfacing and programming of LED, LCD, seven segment display, switch, Buzzer and Relay.	T2	22-28	Practical	1	14
15.	Interfacing and programming of ADC and DAC	T2	163-166	Practical	1	15
16.	Interfacing and programming of Temperature, humidity sensor.	R2	87-115	Practical	1	16



17.	Ultrasonic sensor, Infrared sensor and Accelerometer.	R2	116 - 155, 164-167	Practical	1	17
18.	Stepper motor and dc motor.	W4	-	Practical	1	18

**LEARNING OUTCOME**

At the end of unit, students should be able to

- Study the architectural features of 8051 microcontroller.
- Know the interfacing of I/O devices and sensors with 8051 microcontroller.

**UNIT IV PROGRAMMING OF WIRELESS COMMUNICATION MODULES (6)**

Topic No	Topic	Books for Reference	Page No.	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
19.	Wireless technology for industrial and control applications.	W3	-	PPT	1	19
20.	Development and implementation of wireless communication using Zigbee.	W5	-	Practical	1	20
21.	Bluetooth.	W5	-	Practical	1	21
22.	LiFi, and Wi-Fi.	W5	-	Practical	1	22
23.	Development and Implementation of wireless control using GSM.	W5	-	Practical	1	23
24.	GPS	W5	-	Practical	1	24

**LEARNING OUTCOME**

At the end of unit, students will be able to

- Interface wireless communication module for real-time system.
- Implement wireless communication application.

**UNIT V REAL TIME SYSTEM APPLICATION EXAMPLES (6)**

25.	Automatic Irrigation System	W5	-	Practical	1	25
26.	Real time air pollution monitoring system using GSM and GPS	W5	-	Practical	1	26
27.	LPG gas leakage and fire alert safety system	W5	-	Practical	1	27
28.	Camera based anti theft security system	W5	-	Practical	1	28
29.	Remote wireless control of electrical and electronics home appliances/industrial machines	W5	-	Practical	1	29
30.	Smart watch for heart rate and BP monitoring	W5	-	Practical	1	30

**LEARNING OUTCOME**

At the end of unit, students will be able to

- Design Real-time Electronics systems.
- Implement Real-time Electronics applications.

### COURSE OUTCOME

At the end of the course, the students will be able to

- Apply knowledge of basic Electronics for realizing real time electronics system
- Design applications based on sensors, IO devices, peripheral ICs and microcontroller.
- Formulate Hardware and software design of real-time system.
- Build real-time electronic applications.

### INTERNAL ASSESSMENT DETAILS

ASST. NO.	I	II
Topic Nos.	1 - 15	16-30
Date		

Prepared by

Mr.T.Jeyaseelan

Verified by

HOD/ECE

Approved by

Principal



**KINGS**  
COLLEGE OF ENGINEERING  
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Approved by AICTE, New Delhi, Affiliated to



**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**ACADEMIC YEAR 2019-2020 / ODD SEMESTER**

**TIME TABLE for VALUE ADDED COURSES**

**III ECE**

**Class Strength: 48**

Session	1	2	10.45 am - 11.00 am	3	4	12.30 pm - 01.10 pm	5	6	7	3.25 am - 3.40 pm	8
Day	09.15am - 10.00am	10.00am - 10.45am		11.00am - 11.45am	11.45am - 12.30pm		01.10pm - 01.55pm	01.55pm - 02.40pm	02.40pm - 03.25pm		03.40pm - 04.35pm
SAT	EC 851 (Theory session)	EC 851 (Practical session)	BREAK	EC 851 (Practical session)		LUNCH BREAK				BREAK	

SUB. CODE	NAME OF THE SUBJECT	NAME OF THE STAFF	DEPT.	PERIODS/WEEK
EC 851	Real Time Electronics system design	Mr. T. Jeyaseelan	ECE	4

*[Signature]*  
DEPT. VACC

*[Signature]* 10/6/19  
HEAD OF THE DEPARTMENT

*[Signature]* 10/6/19  
PRINCIPAL





**CENTRE FOR ACADEMIC COURSES**  
**ANNA UNIVERSITY**  
CHENNAI - 600 025

Off: 22357077 / 73  
22357074  
Fax / Dir : 22352272



16.08.2019

**Dr. R. RAJU**  
**DIRECTOR**

Letter No.2520/AU/VA/CAC/FICE/2019

To  
The Controller of Examinations  
Anna University  
Chennai - 25.

Sir

Sub: A.U. - CAC - Affiliated Institutions - Value Added Courses - Reg.  
Ref: Letter No.KCE/PRL/VAC/125/18-19.  
\*\*\*\*\*

With reference to the letter cited, the following Value Added Courses offered by Kings College of Engineering, Affiliated Institutions is allotted the course code as detailed below.

SI.NO	CODE ALLOTTED	TITLE	Credits			
			L	T	P	C
1.	IVA019	Real Time Electronics System Design	1	0	1	2

This is for your kind information and necessary action at your end.

Yours faithfully,

**DIRECTOR**

Copy to:

1. The Principal, Kings College of Engineering, Chennai - Bangalore Highway, Opposite to Hyundai Motors, Sriperumbudur Taluk, Irungattukottai - 602117
2. The Chairperson, Faculty of Information and Communication Engineering, A.U., Chennai -25.
3. The Stock File.

*J. Monu*  
19/8/2020  
**PRINCIPAL**  
**Kings College of Engineering,**  
**PUNALIKULAM - 613 303**

**AFFILIATED INSTITUTIONS  
FACULTY OF INFORMATION AND COMMUNICATION ENGINEERING  
LIST OF VALUE ADDED COURSES**

S. NO	CODE ALLOTTED	COURSE TITLE	CREDITS
			L T P C
1.	IVA001	Design Thinking	1 0 1 2
2.	IVA002	PCB Design, Embedded System Interfacing with Arduino & Robotics	1 0 1 2
3.	IVA003	Interactive Web Designing and Progressive Java	1 0 1 2
4.	IVA004	Robotics and its Applications	1 0 1 2
5.	IVA005	VB.NET	1 0 2 2
6.	IVA006	Enterprise Application Development and Deployment on Cloud using IBM Bluemix	0 0 2 1
7.	IVA007	Predictive Modeling using IBM SPSS Modeler	0 0 2 1
8.	IVA008	Enterprise Mobile Application Development using IBM Worklight	0 0 2 1
9.	IVA009	iOS App Development	0 0 2 1
10.	IVA010	Transfer Learning Frameworks	0 0 2 1
11.	IVA011	Data Science with Python	1 0 1 2
12.	IVA012	Internet of Things with Node MCU	0 0 2 1
13.	IVA013	Virtual Instrumentation	1 0 1 2
14.	IVA014	IC Test Engineering	1 0 1 2
15.	IVA015	Learning C	1 0 1 2
16.	IVA016	Internet of Things Using Broadcom BCM2837	1 0 1 2
17.	IVA017	PHP and MYSQL	0 0 2 1
18.	IVA018	Advanced Python and Introduction to Machine Learning	0 0 2 1
19.	IVA019	Real Time Electronics System Design	1 0 1 2
20.	IVA020	Case Study – Operating System Design	0 0 2 1
21.	IVA021	Case Study – Network Design	0 0 2 1
22.	IVA022	Electronic Circuits Making and PCB Design	0 0 2 1
23.	IVA023	Data Mining Laboratory	0 0 2 1
24.	IVA024	Multimedia Laboratory	0 0 2 1
25.	IVA025	Visual Basic Laboratory	0 0 2 1
26.	IVA026	Advanced Java Programming	1 0 1 2
27.	IVA027	Website Blog Design	0 0 2 1
28.	IVA028	Virtual Instrumentation Using Lab View	1 0 1 2
29.	IVA029	Angular J S	0 0 2 1
30.	IVA030	Simulation and Analysis of Networks Using Software (NS-2)	0 0 2 1
31.	IVA031	The Ruby Programming Language	0 0 2 1
32.	IVA032	VB.Net Programming	0 0 2 1
33.	IVA033	Networking Design and Security	0 0 2 1



34.	IVA034	Radio Frequency Circuit Design	1 0 2 2
35.	IVA035	Internet of things (IOT) Application Development	1 0 2 2
36.	IVA036	Advanced Graphical System Design and DAS Design	1 0 2 2
37.	IVA037	Lab VIEW Programming	0 0 2 1
38.	IVA038	Smart Home – Theory and Practices	1 0 2 2
39.	IVA039	Ethical Hacking	1 0 2 2
40.	IVA040	System Design Using Micro Controllers	1 0 2 2
41.	IVA041	Robotic Process Automation Using Automation Anywhere	1 0 2 2
42.	IVA042	Blockchains and Cryptocurrencies	1 0 2 2
43.	IVA043	Non Linear Electronics and Modelling	1 0 2 2
44.	IVA044	Intrusion and Anomaly Detection Systems	1 0 2 2
45.	IVA045	React Framework	0 0 2 1
46.	IVA046	Advanced Graphical System Design DAS Design using NI technology	0 0 2 1
47.	IVA047	Embedded Systems Design using PIC Controller	1 0 2 2
48.	IVA048	PCB Designing	0 0 2 1
49.	IVA049	Verilog and System Verilog	1 0 2 2
50.	IVA050	Hands-on training on LabVIEW Core1	1 0 2 2
51.	IVA051	Administrative Essentials for New Admins in Lighting Experience	1 0 2 2
52.	IVA052	Data Visualization and Machine Learning using Python	0 0 2 1
53.	IVA053	Robotics Programming	0 0 2 1
54.	IVA054	Troubleshooting and Maintenance of Home Appliances	0 0 2 1
55.	IVA055	Communication and Image Processing Using MATLAB	1 0 2 2
56.	IVA056	Big Data Statistical Analysis Using R Programming	1 0 2 2
57.	IVA057	Network Engineering – Routing and Switching	1 0 2 2
58.	IVA058	Web Application Development using ASP.NET	0 0 2 1
59.	IVA059	AWS and Azure Cloud Management	1 0 2 2
60.	IVA060	Full Stack Web Development	1 0 2 2
61.	IVA061	Embedded using Raspberry Pi	1 0 2 2
62.	IVA062	Data Science in R and Python	1 0 2 2
63.	IVA063	Mobile Phone Technology	1 0 2 2
64.	IVA064	Arduino Programming	0 0 2 1
65.	IVA065	Ethical Hacking and Network Security	1 0 2 2
66.	IVA066	Machine learning Techniques	0 0 2 1
67.	IVA067	IOT using Arduino	1 0 2 2
68.	IVA068	End to End Project Implementation using Spring Framework	0 0 2 1
69.	IVA069	Django Web Application Framework	0 0 2 1
70.	IVA070	Model Development using Exploratory Analysis	0 0 2 1
71.	IVA071	Attacks and Vulnerabilities Laboratory	0 0 2 1
72.	IVA072	Augmented and virtual Reality	1 0 2 2
73.	IVA073	MEMS and NEMS	1 0 2 2



74.	IVA074	Blockchain Technology and its Essentials	0 0 2 1
75.	IVA075	Machine Intelligence	1 0 2 2
76.	IVA076	Cyber Security Practices	0 0 2 1
77.	IVA077	Data Science	0 0 2 1
78.	IVA078	Internet of Things Practices	0 0 2 1
79.	IVA079	Kotlin Programming	0 0 2 1
80.	IVA080	PCB Design and Fabrication	0 0 2 1
81.	IVA081	Advanced Arduino Programming and Its Application	0 0 2 1
82.	IVA082	Robotics in Biomedical Engineering	0 0 2 1
83.	IVA083	Connected Car-Electronics	1 0 2 2
84.	IVA084	Embedded Systems Design Using ARM LPC2148	1 0 2 2
85.	IVA085	Design and Analysis of MOS Circuits	1 0 2 2
86.	IVA086	MERN Stack	1 0 2 2
87.	IVA087	CANSAT Design and Development	1 0 2 2
88.	IVA088	Azure AI and Cloud Data Fundamentals	0 0 2 1
89.	IVA089	Linux Administration	1 0 2 2



**DIRECTOR  
CENTRE FOR ACADEMIC COURSES**

# Department of Electrical and Electronics Engineering

# Academic year 2019-2020





**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**  
**DESIGN AND DEVELOPMENT OF CURRICULUM FOR**  
**ADD – ON COURSE (Value Added Course)**  
**EVA002 - ADVANCES IN SOLAR ENERGY TECHNOLOGIES**  
**Table of Contents**

<b>Academic Year 2019-20</b>	
1.	Requisition Letter from College to Anna University
2.	ADD – ON Course Syllabus
3.	Course Plan
4.	Time Table
5.	Approval Letter from Anna University
6.	Anna University Approved Value Added Course List - <b>EVA002 - Advances in Solar Energy Technologies</b>

*[Signature]* 14/11/19  
**Staff In-charge**

*[Signature]* 14/11/19  
**Head of the Department**

*[Signature]*  
 14/11/2019

**PRINCIPAL**  
**Kings College of Engineering**  
**PUNALKULAM-613 303.**

Dr. J. Arputha Vijaya Selvi, M.E., Ph.D.,  
**PRINCIPAL**

Ref: KCE / PRL / VAC/113/18-19

21.05.2019

To  
The Director  
Center for Academic Courses  
Anna University, Chennai

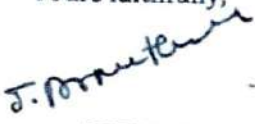
Respected Sir,

Sub: Requisition for approving the Value Added Course on Advances in  
Solar Energy Technologies for the batch of 2017 - 2021 -reg

As per the AU Regulation 2017, the EEE department of our college has planned to  
conduct the Value Added Course with 2 credits on the topic of Advances in Solar Energy  
Technologies for the batch 2017 -2021 having the strength of 15 students. Herewith the  
syllabus and course plan are enclosed. We request you to kindly approve organizing the  
course and its syllabus. With your consent, we will organize the course during the  
current academic session (2019 - 2020 Odd Semesters).

Thanking You,

Yours faithfully,

  
**PRINCIPAL**  
**Kings College of Engineering**  
**PUNALKULAM-613 303.**

Encl:

- i) Syllabus
- ii) Course Plan

Copy to

The Controller of Examinations, Anna University, Chennai - 600 025.

## ADVANCES IN SOLAR ENERGY TECHNOLOGIES

<b>UNIT 1</b>	<b>ADVANCES IN SOLAR PV MATERIALS</b>	<b>6</b>
---------------	---------------------------------------	----------

<b>UNIT II</b>	<b>MPPT CRITERIA FOR PV SYSTEMS</b>	<b>6</b>
----------------	-------------------------------------	----------

<b>UNIT III</b>	<b>STAND ALONE PV SYSTEM</b>	<b>6</b>
-----------------	------------------------------	----------

<b>UNIT IV</b>	<b>GRID CONNECTED PV SYSTEMS</b>	<b>6</b>
----------------	----------------------------------	----------

UNIT V MODELLING AND SIMULATION OF PV SYSTEMS USING MATLAB 6

**TOTAL: 30 PERIODS**

A. Alim  
HOD/ EEE





## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE PLAN

Sub. Code	:	Branch / Year / Sem : B.E EEE / III / V
Sub. Name	:	Advances In Solar Energy Technologies Batch : 2017-2021
Staff Name	:	Mr.J.Arokiaaraj & Mr.C.JohnSelvaraj Academic Year : 2019 - 20 (ODD)

### COURSE OBJECTIVE

1. To get an overview of different types of photovoltaic semiconductor devices and their characteristics.
2. To analyze the operation and performance parameters MPPT criteria for PV systems.
3. To study the operation techniques and basics topologies standalone operation of PV system.
4. To learn the different techniques of grid connected PV system.
5. To study the modelling and simulation of PV systems using MATLAB.

### TEXT BOOKS

- T1. Solar Cells: Materials, Manufacture and Operation, Tom Markvart University of Southampton, UK and Luis Castafier Universidad Politecnica de Catalunya, Barcelona, Spain, First edition 2005 Reprinted 2005, 2006, Elsevier Ltd.
- T2. Study of maximum power point tracking (MPPT) techniques in a solar photovoltaic array, Arjav Harjai, Abhishek Bhardwaj, Mrutyunjaya Sandhibigraha, nit, Rourkela.
- T3. Solanki C.S., "Solar Photovoltaics: Fundamentals, Technologies And Applications", PHI Learning Pvt. Ltd., 2015.
- T4. Modeling and Simulation of Systems Using MATLAB and Simulink, Devendra K. Chaturvedi, CRC Press, 2010 by Taylor and Francis Group, LLC.

### REFERENCE BOOKS

- R1. "Power Electronics for Renewable Energy Systems". C.R.Bala Murugan, D.Periyaazhagar, N.Suresh, Sruthi Publishers, Jan - 2017.
- R2. "Solar Photovoltaic Technology and systems", Chetan Singh Solanki, PHI Publications. 2017.

### WEB RESOURCES

- W1. <http://www.energy.wsu.edu/Documents/SolarPVforBuildersOct2009.pdf> (Topic No. 06)
- W2. <https://pdfs.semanticscholar.org/1db7/435215cb2d9895bc29e0358a9b23300988f5.pdf> (Topic No. 12)
- W3. <https://www.sciencedirect.com/science/article/pii/S0960148105002831> (Topic No. 22)
- W4. [http://www.os.ucg.ac.me//MS\\_kn.pdf](http://www.os.ucg.ac.me//MS_kn.pdf) (Topic No. 27)

Topic No	Topic	Books for Reference	Page No.	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
<b>UNIT I ADVANCES IN SOLAR PV MATERIALS (6)</b>						
1.	Semiconductor Materials and Modelling	T1	30-52	BB	1	1
2.	Crystalline silicon solar cells.	T1	72-86	BB	1	2
3.	Thin film technologies.	T1	218-337	PPT	1	3
4.	Space and concentrator cells.	T1	354-388 393-442	BB	2	5
5.	Organic and dye sensitized cells.					
6.	Evaluating a Site for Solar PV Potential.	W1	-	PPT	1	6

**LEARNING OUTCOME**

At the end of unit, students should be able to

- Describe the basic materials of PV cells.
- Understand the concepts of PV Power Generation semiconductor devices.

<b>UNIT II TESTING, CALIBRATION AND MPPT CRITERIA FOR PV SYSTEMS (6)</b>						
7.	Testing.	T1	452-497	PPT	2	8
8.	Monitoring and Calibration.					
9.	Photovoltaic System Components.	T2	17-25	BB	1	9
10.	Maximum Power Point Tracking Algorithms.	T2	25 -29	BB	2	11
11.	Different MPPT techniques.					
12.	Implementation of MPPT using a boost converter.	W2	-	BB	1	12

**LEARNING OUTCOME**

At the end of unit, students should be able to

- Study and analyze the Solar Photovoltaic System Components.
- To develop the different maximum power point tracking algorithms.
- To implement the various techniques of MPPT.

<b>UNIT III STAND ALONE PV SYSTEM (6)</b>						
13.	Solar modules.	T3	352-370	PPT	1	13
14.	Storage systems.	R2	120-142	BB	1	14
15.	Power conditioning and regulation.	R1	3.28-3.47	BB	1	15
16.	Protection.	R1	3.13-3.14	BB	1	16
17.	Stand-alone PV systems design.	T3	420-423	Sem	1	17
18.	Sizing.	T3	437-440	BB	1	18

**LEARNING OUTCOME**

At the end of unit, students should be able to

- Study and analyze the Solar Modules and Storage systems.
- Getting detailed operating for Standalone PV systems and Sizing.



# UNIT IV GRID CONNECTED PV SYSTEMS (6)

Topic No	Topic	Books for Reference	Page No.	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
19.	PV systems in buildings.	T1	446-450	BB	1	19
20.	Design issues for central power stations.	R1	4.28-4.36	BB	1	20
21.	Safety.	T1	299-300	BB	1	21
22.	Economic aspect.	W3	-	PPT	1	22
23.	Efficiency and performance.	T1	173-177	BB	1	23
24.	International PV programs.	R1	5.31-5.32	BB	1	24

## LEARNING OUTCOME

At the end of unit, students should be able to

- Study the Design issues for central power stations.
- Understand the Economic aspect, Efficiency and performance.

# UNIT V MODELLING AND SIMULATION OF PV SYSTEMS USING MATLAB (6)

25.	Introduction to Systems, Systems Modeling.	T4	1-98	BB	1	25
26.	Formulation of State Space Model of Systems.	W4	-	PPT	1	26
27.	Model Order Reduction.	T4	219-263	BB	1	27
28.	Interpretive Structural Modeling.	T4	300-325	BB	1	28
29.	System Dynamics Techniques	T4	327-344	BB	1	29
30.	Simulation.	T4	401-420	PPT	1	30

## LEARNING OUTCOME

At the end of unit, students should be able to

- Understand the Impact of Simulation.
- Analyze of the techniques used for simulation tools.

## COURSE OUTCOME

At the end of the course, the students will be able to

- Use different materials used for photovoltaic cells manufacturing.
- Understand the principles and operation techniques used for MMPT.
- Analyze and design standalone operation of PV power generation.
- Describe the various grid connecting techniques for PV system.
- Understand the simulation tools used for photovoltaic power generation.

## INTERNAL ASSESSMENT DETAILS

ASST. NO.	I	II
Topic Nos.	1 - 15	16-30
Date		

Prepared by

Mr. J. Arokiaraj & Mr. C. John Selvaraj

Verified by

HOD/EEE

Approved by

Principal





## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ACADEMIC YEAR 2019-2020 / ODD SEMESTER

### TIME TABLE for VALUE ADDED COURSES

III EEE

Class Strength : 15

Session	1	2	10.45 am - 11.00 am	3	4	12.30 pm - 01.10 pm	5	6	7	3.25 am - 3.40 pm	8
Day	09.15am - 10.00am	10.00am - 10.45am		11.00am - 11.45am	11.45am - 12.30pm		01.10pm - 01.55pm	01.55pm - 02.40pm	02.40pm - 03.25pm		03.40pm - 04.35pm
SAT	EVA002	EVA002	BREAK	EVA002	EVA002	LUNCH BREAK	EE8591	EE8501	EE8552	BREAK	OMD551

SUB. CODE	NAME OF THE SUBJECT	NAME OF THE STAFF	DEPT.	PERIODS/WEEK
EVA002	Advances in solar energy technologies	Mr. J. Arokiaraj & Mr.C. John Selvaraj	EEE	4

*[Signature]*  
DEPT. VACC

*[Signature]*  
HEAD OF THE DEPARTMENT

*[Signature]*  
PRINCIPAL



copy to HoD/EEB.

**CENTRE FOR ACADEMIC COURSES**  
ANNA UNIVERSITY  
CHENNAI - 600 025

Off: 22357077 / 73

22357074

Fax / Dir : 22352272



Dr. R. RAJU  
DIRECTOR

Letter No:2518/AU/EVA/CAC/2019

13.06.2019

To  
The Controller of Examinations  
Anna University  
Chennai - 25.



Sir,

Sub : A.U. - CAC - Kings College of Engineering - Value Added Course - Reg.

Ref. : Letter No. KCE/PRL/VAC/113/18-19, from Kings College of Engineering.  
Dated: 22.05.2019 & 07.06.2019.

With reference to the letter cited above, the following Value Added Course offered by Kings College of Engineering, Affiliated Institutions is allotted the course code as detailed below.

S.No	Code Allotted	Title
1.	EVA002	Advances In Solar Energy Technologies

This is for your kind information and necessary action at your end.

Yours faithfully

  
DIRECTOR

Copy to:

1. The Chairperson, Faculty of Electrical Engineering, Anna University, Chennai - 25.
2. The Principal, Kings College of Engineering, Punalkulam, Gandarvakottai Taluk, Pudukkottai District, Tamilnadu - 613 303.
3. The Stock File


**AFFILIATED INSTITUTIONS**  
**FACULTY OF ELECTRICAL ENGINEERING**  
**APPROVED LIST OF VALUE ADDED COURSES**

Sl.No.	Subject Code	Subject Name	L	T	P	C
1.	EVA001	Solar Photovoltaic System Design	2	0	0	2
2.	EVA002	Advances in Solar Energy Technologies	2	0	0	2
3.	EVA003	Arduino Programming	1	0	0	1
4.	EVA004	Material Detection and Inspection Technology	1	0	2	2
5.	EVA005	Industrial Automation with PLC	0	0	2	1
6.	EVA006	Industrial Process Control and Instrumentation	0	0	2	1
7.	EVA007	Energy Conservation, Management and Audit	1	0	0	1
8.	EVA008	Field Oriented Control of BLDC, Induction and Synchronous Motors	1	0	0	1
9.	EVA009	Industrial Automation using PLC & SCADA	1	0	2	2
10.	EVA010	LabVIEW Core -1 and Core - 2 levels with Certified LabVIEW Developer (CLAD) Certification Training	2	0	0	2
11.	EVA011	Solar Photovoltaic Technology	2	0	0	2
12.	EVA012	Measurements in Process Industries	1	0	0	1
13.	EVA013	Automation and Control	0	0	2	1
14.	EVA014	ECAD	0	0	2	1
15.	EVA015	SCADA	0	0	2	1
16.	EVA016	Electric and Hybrid Vehicles	2	0	0	2
17.	EVA017	Programmable Logic Controller	1	0	0	1
18.	EVA018	Factory Automation	1	0	0	1
19.	EVA019	MATLAB and SIMULINK for Electrical Engineers	2	0	0	2
20.	EVA020	Electrical Machine Design	0	0	2	1
21.	EVA021	Abstract for Industrial Internet of Things with Real Time Data Logging	1	0	0	1



22.	EVA022	Industrial and Home Automation	2	0	0	2
23.	EVA023	Supervised Machine Learning for Image Classification	2	0	0	2
24.	EVA024	Fuzzy Logic System and Applications	2	0	0	2
25.	EVA025	Electronic Design Automation & PCB Designing by using ORCAD	2	0	0	2
26.	EVA026	Solar Power Design, Operation and Installation	2	0	0	2
27.	EVA027	Sensor Applications using Arduino and Raspberry Pi	2	0	0	2
28.	EVA028	Solar PV System Design and Installation.	2	0	0	2
29.	EVA029	Design and Development of Robotics	2	0	0	2
30.	EVA030	Embedded Laboratory	0	0	2	1
31.	EVA031	Graphical Programming Using Labview	1	0	2	2
32.	EVA032	VERILOG HDL	2	0	0	2
33.	EVA033	Electric Vehicles	2	0	0	2
34.	EVA034	Product Design and Development in Power Electronics and Embedded Systems	2	0	0	2
35.	EVA035	Trends in Smart Grid	1	0	0	1
36.	EVA036	Arduino Programming and Interfacing	0	0	2	1

  
 26/9/2020  
 DIRECTOR  
 CENTRE FOR ACADEMIC COURSES

  
 26/9/2020

**DEPARTMENT OF  
MECHANICAL ENGINEERING**

ACADEMIC

YEAR

2019-2020





**DEPARTMENT OF MECHANICAL ENGINEERING**  
**DESIGN AND DEVELOPMENT OF CURRICULUM FOR**  
**ADD – ON COURSE (Value Added Course)**  
**MAV010 & Energy Resource Management**


**Table of Contents**

S.No	Academic Year 2019-20
1.	Requisition Letter From College to Anna University
2.	Add – On Course Syllabus
3.	Course Plan
4.	Time Table
5.	Approval Letter From Anna University
6.	Anna University Approved Value Added Course List – MAV010 & Energy Resource Management listed at University Website S.No : 10

  
Course Coordinator

  
HoD/Mech

**H O D**  
 DEPARTMENT OF MECHANICAL ENGINEERING  
 KINGS COLLEGE OF ENGINEERING  
 PUNALKULAM

  
Principal  
**PRINCIPAL**  
 Kings College of Engineering,  
 PUNALKULAM - 613 303.

Dr. J. Arputha Vijaya Selvi, M.E., Ph.D.,  
**PRINCIPAL**

Ref: KCE / PRL / VAC / 133 / 19-20

22.06.2019

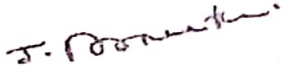
To  
The Director  
Center for Academic Courses  
Anna University, Chennai

Respected Sir,

**Sub: Requisition for approving the Value Added Course on Energy Resources and Management for the batch of 2017 - 2021 -reg**

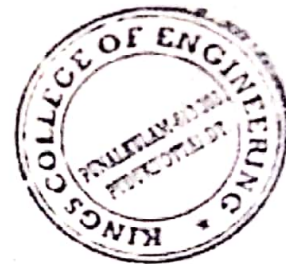
As per the AU Regulation 2017, the Mechanical department of our college has planned to conduct the Value Added Course with 2 credits on the topic of **Energy Resources and Management** for the **batch 2017 -2021** having the strength of 70 students. Herewith the syllabus and course plan are enclosed. We request you to kindly approve organizing the course and its syllabus. With your consent, we will organize the course during the current academic session **2019 - 2020 Odd Semesters**.

Thanking You

  
Yours faithfully  
Dr. J. Arputha Vijaya Selvi,  
B.E., M.E., Ph.D.  
PRINCIPAL  
Kings College of Engineering  
Punalkulam - 613 303

Encl:

- i) Syllabus
- ii) Course Plan
- iii) Time Table



Copy to  
The Controller of Examinations, Anna University, Chennai - 600 025.



Punalkulam, Gandarvakottai Taluk, Pudukkottai District - 613 303, Ph: 04362-282474, 282395, 282396. Fax: 04362-282494.

## SYLLABUS

MAV 010

ENERGY RESOURCES AND MANAGEMENT

L T P C

2 0 0 2

### **UNIT I FOSSIL FUEL ENERGY**

**6**

Coal, Oil, Natural gas, Nuclear power and Hydro - environmental impact of fossil fuels - Energy scenario in India - Growth of energy sector and its planning in India.

### **UNIT II SOLAR & WIND ENERGY- ALTERNATE SOURCE**

**6**

Solar thermal applications - heating, cooling, desalination, drying, cooking, etc. - solar thermal electric power plant - types of solar cells - Photovoltaic applications - Nature of the wind - factors influencing wind - wind data and energy estimation - wind resource assessment systems.

### **UNIT III BIO-ENERGY**

**6**

Biomass resources and their classification - Biomass conversion processes - direct combustion - biomass gasification - pyrolysis and liquefaction - biochemical conversion - anaerobic digestion - types of biogas Plant - applications - Urban waste to energy conversion.

### **UNIT IV OTHER TYPES OF ENERGY**

**6**

Ocean energy resources - ocean thermal power plant - ocean wave energy conversion - small hydro - geothermal energy - geothermal power plant - Fuel cell - principle of working - various types - construction and applications.

### **UNIT V ENERGY CONVERSION & MANAGEMENT**

**6**

Photovoltaic conversion of solar energy - Thermo chemical conversion - ocean thermal energy conversion (OTEC) - tidal energy conversion - Industrial management.

**TOTAL: 30 PERIODS**



**SIGNATURE OF STAFF INCHARGE**



**HOD/MECH**





**KINGS**  
COLLEGE OF ENGINEERING  
(NAAC Accredited Institution)  
(Approved by AICTE, New Delhi, Affiliated to  
Anna University, Chennai)



## DEPARTMENT OF MECHANICAL ENGINEERING COURSE PLAN

<b>Sub. Code</b>	: MAV 010	<b>Branch / Year / Sem:</b>	B.E. Mech / III/V
<b>Sub. Name</b>	: Energy Resources and Management	<b>Batch</b>	: 2017-2021
<b>Staff Name</b>	: S. Sabanayagam	<b>Academic Year</b>	: 2019-20 (ODD)

### COURSE OBJECTIVE

- ❖ To explain concept of various forms of Non-renewable and renewable energy.
- ❖ To outline division aspects and utilization of renewable energy sources for both domes
- ❖ tics and industrial applications
- ❖ To study the environmental and cost economics of using renewable energy sources compared to fossil fuels.

### REFERENCE BOOKS

- R1. B H Khan "Non-Conventional Energy Resources", Third Edition, Tata McGraw-Hill, 2007
- R2. P K Nag, "Power plant Engineering", McGraw Hill Education, 2014.

### WEB RESOURCES

- |     |   |               |
|-----|---|---------------|
| W1. | <a href="https://prezi.com/7fugbh0ndsub/nuclear-energy-vs-hydro-energy">https://prezi.com/7fugbh0ndsub/nuclear-energy-vs-hydro-energy</a>                           | (Topic No 02) |
| W2. | <a href="http://www.eolss.net/sample-chapters/c09/e4-23-02.pdf">www.eolss.net/sample-chapters/c09/e4-23-02.pdf</a>  | (Topic No 05) |
| W3. | <a href="https://www.slideshare.net/vanitathakka/solar-radiation-measurement">https://www.slideshare.net/vanitathakka/solar-radiation-measurement</a>               | (Topic No 07) |
| W4. | <a href="https://cleanenergyaction.files.wordpress.com-ppt">https://cleanenergyaction.files.wordpress.com-ppt</a>   | (Topic No 10) |
| W5. | <a href="http://www.csun.edu/~psk17793/ES9CP/ES9%20factors_affecting_wind.htm">www.csun.edu/~psk17793/ES9CP/ES9%20factors_affecting_wind.htm</a>                    | (Topic No 11) |
| W6. | <a href="https://www.slideshare.net/aslam55/biomass-conversion-technologies">https://www.slideshare.net/aslam55/biomass-conversion-technologies</a>                 | (Topic No 12) |
| W7. | <a href="http://www.teriin.org/technology/biomass-gasifier">www.teriin.org/technology/biomass-gasifier</a>  | (Topic No 13) |
| W8. | <a href="http://www.alternative-energy-tutorials.com">www.alternative-energy-tutorials.com</a> › Tidal Energy   | (Topic No 18) |
| W9. | <a href="https://energy.gov/eere/geothermal/how-geothermal-power-plant-works-Simple">https://energy.gov/eere/geothermal/how-geothermal-power-plant-works-Simple</a> | (Topic No 26) |



Topic No	Topic	Books for Reference	Page No.	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
<b>UNIT I FOSSIL FUEL ENERGY(6)</b>						
1	Coal, Oil, Natural gas	R2	155-160	BB	1	1
2	Nuclear power and Hydro power	R2,W1	578-620	BB	1	2
3	Environmental impact of fossil fuels	R1,	9-14	BB	1	3
4	Energy scenario in India	R1	17-22	BB	1	4
5	Growth of energy sector and its planning in India.	R1, W2	23-24	BB	2	6

#### LEARNING OUTCOME

At the end of unit, students should be able to

- Analyze the resources of energy.
- Understand the energy consumption pattern.
- Identify the growth of energy sector.

<b>UNIT II SOLAR&amp; WIND ENERGY- ALTERNATE SOURCE</b>						<b>(6)</b>
6	Solar thermal applications	R1	91-110	BB	1	7
7	Solar thermal electric power plant	R1, W3	113-116	BB,PPT	1	8
8	Photovoltaic applications	R1	117-122	BB	1	9
9	Nature of the wind, power in the wind	R1	156-160	BB	1	10
10	Factors influencing wind, wind data and energy estimation	R1, W4	155-156	BB	1	11
11	Wind resource assessment	R1, W5	157-166	BB PPT	1	12

#### LEARNING OUTCOME

At the end of unit, students should be able to

- Analyze the solar radiation& wind resource
- Understand the concept of photovoltaic applications.
- Understands the solar and wind assessment.

<b>UNIT III BIO - ENERGY (6)</b>						
12	Biomass resources and their classification	R1, W6	197-204	BB PPT	1	13
13	Direct combustion – biomass gasification	R1, W7	208-210	BB	1	14



14	Pyrolysis and liquefaction	R1	212-215	BB	2	16
15	Types of biogas Plant - applications	R1	221-223	BB	1	17
16	Urban waste to energy conversion.	R1	206-230	BB	1	18

**LEARNING OUTCOME**

At the end of unit, students should be able to

- Understand the concept of Bio power.
- Knowledge about biomass gasification.
- Knowledge about biogas plant & waste conversion.

**UNIT IV OTHER TYPES OF ENERGY(6)**

17	Ocean energy resources - ocean thermal plant	R1	270-274	BB	2	20
18	Geothermal Energy & Geothermal power plant	R1, W8	232-244	BB, PPT	2	22
19	Fuel cell – principle of working	R1	277-292	BB, PPT	1	23
20	Various types - construction and applications	R1	293-302	BB, PPT	1	24

**LEARNING OUTCOME**

At the end of unit, students should be able to

- Understand the principle of ocean thermal energy conversion
- Knowledge about the geo thermal power plant
- Analyze the constructions of fuel cell

**UNIT V ENERGY CONVERSION & MANAGEMENT(6)**

21	Photovoltaic conversion of solar energy	R1	117-122	BB	1	25
22	Thermo chemical conversion	R1,	117-118	BB,PPT	1	26
23	Biomass conversion processes	R1, W7	204-205	BB, PPT	1	27
24	Biochemical conversion	R1	216-220	BB	1	28
25	ocean thermal energy conversion (OTEC)	R1	260-270	BB	1	29
26	Tidal energy conversion, Industrial Management	R1, W9	250-254 -	BB, PPT	1	30

**LEARNING OUTCOME**

At the end of unit, students should be able to

- Understand the various conversion of energy resources
- Understands the need of energy management.



**COURSE OUTCOME**

At the end of the course, the students will be able to

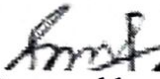
- Understand the commercial energy and renewable energy sources.
- Knowledge about the working principle of various energy systems.
- Apply the knowledge on solar energy collectors.
- Understand the sources of Bio- energy.
- Compare different types of non renewable energy resources.

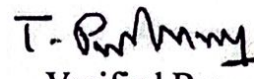
**CONTENT BEYOND THE SYLLABUS**

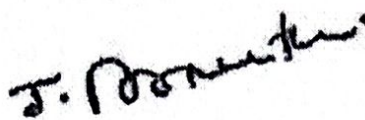
1. Nuclear energy.
2. Hydraulic energy

**INTERNAL ASSESSMENT DETAILS**

TEST NO.	I	II
Topic Nos.	1-11	12-26
Date		

  
Prepared by  
S. Sabanayagam

  
Verified By  
HOD/Mechanical

  
Approved by  
PRINCIPAL



**DEPARTMENT OF MECHANICAL ENGINEERING**  
**TIME TABLE (JUNE 2019 - DEC 2019, ODD SEM)**  
**I.E - MECH (Regulation 2017) - With Effect from 10.07.19 - V2**

Batch:2017-2021  
 Year: III

Strength:67  
 Block: II

Year: III			Semester: V				Class Room :209			Block: II		
Session	1	2	10.45 am	3	4	12.30 pm	5	6	2.45 pm	7	8	
Day	09.15am	10.00am	-	11.00am	11.45am	-	01.15pm	02.00 pm	-	3.00 pm	03.45 pm	
	10.00am	10.45am	11.00 am	11.45am	12.30pm	01.15 pm	02.00pm	02.45 pm	3.00 pm	3.45 pm	04.30pm	
MON	ME0512 ME0511		BREAK	ME0512 (B1) ME0511 (B2)		LUNCH BREAK	ME0501	ME0593	BREAK	ME0593	ME0595	
TUE	ME0595	ME0501		ME0594	ME0501		ME0513 ME0511			ME0513 (B2) ME0511 (B1)		
WED	ME0593	ME0595		OAT552	ME0594		ME0512 ME0513			ME0512 (B2) ME0513 (B1)		
THU	ME0594	ME0593		ME0501	OAT552		OAT552	LIB/NET		T&P (A)		
FRI	ME0501	OAT552		ME0594	OAT552		ME0593	ME0595		ME0595	ME0594	
SAT	MAV 010			GATE			MAV 010			NPTEL		

SUB CODE	NAME OF THE SUBJECT	CATEGORY	CREDITS	NAME OF THE STAFF	DEPT	PERIODS/WEEK
<b>TUTORIAL (T), ELECTIVE (E)</b>						
ME0595	Thermal Engineering II	PC	3	Mr.H.Agilan	MECH	5
ME0593	Design Of Machine Elements	PC	3	Mr.J.Rajaparthiban	MECH	5
ME0501	Metrology & Measurements	PC	3	Mr.S.Sabanayagam	MECH	5
ME0594	Dynamics Of Machines	PC	4	Mr.R.Shankar	MECH	5
OAT552	Internal Combustion Engines	OE	3	Mr.P.P.Shantharaman	MECH	5
<b>PRACTICAL (P)</b>						
ME0511	Kinematics & Dynamics Laboratory	PC	2	Mr.B.Ram Vignesh	MECH	4
ME0512	Thermal Engineering Laboratory	PC	2	Mr.H.Agilan	MECH	4
ME0513	Metrology and Measurements Laboratory	PC	2	Mr.V.Vijayakumar	MECH	4
<b>Value Added INITATIVES (VAI)</b>						
T&P(A)	Training and Placement (Aptitude)	VAI	-	Mr.B.Baran Kumar	T&P	2
LIB/NET	Library/Internet	VAI	-	Mr.R.Shankar	MECH	1
MAV 010	Value Added Course	VAI	-	Mr.S.Sabanayagam	MECH	4
GATE	GATE Coaching hour	VAI	-	Mr.R.Shankar	MECH	2
NPTEL	NPTEL Online classes	VAI	-	Mr.R.Shankar	MECH	2

CLASS CO-ORDINATOR	NAME OF THE REPRESENTATIVES	ROLL NO
Mr.R.Shankar	M.Mohd Yasin Sheriff	28
CLASS COMMITTEE CHAIR PERSON	Mr.S.Karthi	

*Signature*  
 DEPT. ITC 10/7/19

*Signature*  
 HOD 10/7/19

*Signature*  
 10/7/2019  
 PRINCIPAL



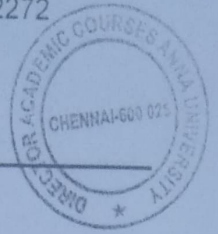


**CENTRE FOR ACADEMIC COURSES**  
**ANNA UNIVERSITY**  
CHENNAI - 600 025

Off: 22357077 / 73

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Fax / Dir : 22352272

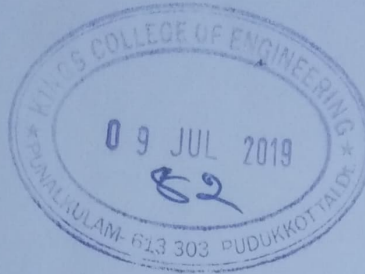


**Dr. R. RAJU**  
**DIRECTOR**

Letter No:2813/AU/VA/CAC/2019

01.07.2019

To  
The Controller of Examinations  
Anna University  
Chennai - 25.



Sir,

Sub : A.U. - CAC - Affiliated Institutions - Value Added Course - Reg.  
Ref : Letter No.KCE/PRL/VAC/133/19-20 dated:20.06.2019.

With reference to the letter cited, the following Value Added Course offered by Kings College of Engineering, Pudukkottai District, Affiliated Institutions is allotted the course code as detailed below.

SL.No	Code Allotted	Title
1.	MVA010	Energy Resources and Management

This is for your kind information and necessary action at your end.

Yours faithfully,

**DIRECTOR**

Copy to:

1. The Chairperson, Faculty of Mechanical Engineering, A.U., Ch -25.
2. The Principal, Kings College of Engineering, Punalkulam, Gandarvakottai Taluk, Pudukkottai District - 613 303.
3. The Stock File - CAC.



**AFFILIATED INSTITUTIONS**  
**FACULTY OF MECHANICAL ENGINEERING**  
**LIST OF VALUE ADDED COURSES**

SL. NO.	CODE ALLOTTED	TITLE	CREDITS
1.	MVA001	Small Unmanned Aerial Vehicle (sUAV) - Drone	2 credit ✓
2.	MVA002	3D Printing	2 credit ✓
3.	MVA003	Elements of Automation and Process Control	1 credit ✓
4.	MVA004	Geometric Dimensioning and Tolerancing	2 credit ✓
5.	MVA005	Smart Materials and Structures	2 credit ✓
6.	MVA006	Green Energy Technologies and Management	2 credit ✓
7.	MVA007	Automation Suite for Smart Systems	2 credit ✓
8.	MVA008	Internet of Things Applications in Mechanical Engineering	1 credit ✓
9.	MVA009	Surface Coating Technology	2 credit ✓
10.	MVA010	Energy Resources and Management	2 0 0 2 ✓
11.	MVA011	Modeling for Design Engineers	2 0 0 2 ✓
12.	MVA012	Basic Concept of HVAC Designing and Drafting	2 0 0 2 ✓
13.	MVA013	Robotics Process Automation	2 0 0 2 ✓
14.	MVA014	Welding and Inspection Techniques	2 0 0 2 ✓
15.	MVA015	Modern Trends in Refrigeration and Air Conditioning	2 0 0 2 ✓
16.	MVA016	Finite Element Meshing Techniques	2 0 0 2 ✓
17.	MVA017	Nanoscience and Technology	2 0 0 2 ✓
18.	MVA018	Plant Design Management System	2 0 0 2 ✓
19.	MVA019	Technology for Energy Storage	2 0 0 2 ✓
20.	MVA020	Modeling Practice for Automotive Assemblies	2 0 0 2 ✓
21.	MVA021	Modeling and Machining Practice for CNC Machines	2 0 0 2 ✓

U. H. 28/9/2020  
 DIRECTOR (CAC)

P. S. 28/9/2020