1.1.3 PROGRAMMEWISE VALUE ADDED COURSES

(Designed by KCE staff, Approved by Anna University (AU))

(AU Approval letter, Syllabus with resource person details, AU site approval list)

TABLE OF CONTENTS

DEPARTMENT OF CIVIL ENGINEERING

VALUE ADDED COURSE

SUBJECT: CVA001- CONSTRUCTION TECHNOLOGY

YEAR/SEMESTER- III year/V sem

S:NO	CONTENT
ACADEMIC YEAR 2020-2021	
1.	Anna University Approval Letter
2.	Syllabus With Resource Person Details
3.	Anna University Approval List
ACADEMIC YEAR 2019-2020	
1.	Anna University Approval Letter
2.	Syllabus With Resource Person Details
3.	Anna University Approval List

Off: 22357077 / 73
22357074
Fax / Dir 22352272

CENTRE FOR ACADEMIC COURSES
ANNA UNIVERSITY
CHENNAI - 600 025

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

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,

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

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

20/8/2020

STAFF INCHARGE
(Mr.K.RANJITH)

HOD/CIVIL
(Mrs.R.REVATHI)

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

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/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/105/102/105102088/# **(Topic.No:20)**

Topic No	Topic	Books for Reference	Page No.	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
UNIT I	STANDARD METHODS OF MEASUREMENTS AND UNITS					6
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						
UNIT II	BUILDING PLANNING					6
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						
UNIT III	ESTIMATION-ABSTRACT AND DETAILING					6
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
UNIT IV		STRUCTURAL ELEMENTS				6
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

UNIT V	FIELD/SITE WORK/CONSTRUCTION ACTIVITIES					6
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 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

20/8/2020
Verified By
HOD/CIVIL

20/8/2020
Approved by
PRINCIPAL

Format-QP09

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

Batch:2018-2022

Year & Semester : III / V

Session	1	2	3	12:30 PM - 01:30 PM	4	5	6
Day	09:30 AM - 10:30 AM	10:30 AM - 11:30 AM	11:30 AM - 12:30 PM		01:30 PM - 02:30PM	02:30 PM - 03:30PM	03:30 PM - 04:30PM
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

20/8/2020
HOD /CIVIL

20/8/2020
PRINCIPAL

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
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

26/9/2020

DIRECTOR
CENTRE FOR ACADEMIC COURSES

23/9/2020

Off: 22357077 / 73
22357074
Fax / Dir 22352272

CENTRE FOR ACADEMIC COURSES
ANNA UNIVERSITY
CHENNAI - 600 025

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

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,

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

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

DEPARTMENT OF CIVIL ENGINEERING

SUBJECT : CONSTRUCTION TECHNOLOGY

SEMESTER : V

QUESTION BANK(CE501)

(Version : 1)

PREPARED BY

Ms.K.JEYASHANKARI, AP/CIVIL

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)

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

DEPARTMENT OF CIVIL ENGINEERING
COURSE PLAN

Sub. Code	: CE501	**Branch/Year/Sem**	: B.E CIVIL /III/V
SubName	: Construction Technology	**Batch**	: 2017-2021
Staff Name	: Ms.K.Jeyashankari	**Academic Year**	: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:

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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
UNIT I	**STANDARD METHODS OF MEASUREMENTS AND UNITS**				**8**	
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
LEARNING OUTCOME At the end of this unit, students will be able to • Learn about the Fundamental & Derived units • Understand the Civil engineering measurements						
UNIT II	**BUILDING PLANNING**				**8**	
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
LEARNING OUTCOME At the end of this unit, students will be able to • Draw the Building plan • Study the building regulations						
UNIT III	**ESTIMATION-ABSTRACT AND DETAILING**				**8**	
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
LEARNING OUTCOME At the end of this unit, students will be able to • Study the analysis of rates • Understand the Earthwork calculations						
UNIT IV STRUCTURAL ELEMENTS					**8**	
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
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						
UNIT V FIELD/SITE WORK/CONSTRUCTION ACTIVITIES					**8**	
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
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 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		

ASSIGNMENT DETAILS

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

Prepared by
Ms.K.JEYASHANKARI
AP/CIVIL

7/5/19.

Verified By
HOD/CIVIL

07/5/19

Approved by
PRINCIPAL

PRINCIPAL
Kings College of Engineering
Punalkulam- 613 303.

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

CERT ISO 9001

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**		**019:30-2.30 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

7/5/19

HOD/CIVIL

07/5/19

PRINCIPAL

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
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

26/9/2020

DIRECTOR
CENTRE FOR ACADEMIC COURSES

23/9/2020

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

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

1.1.3 VALUE ADDED COURSE

Contents

ACADEMIC YEAR

2020-21 ODD SEMESTER

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

30.05.2019

KCE COLLEGE OF ENGINEERING
04 JUN 2019
276

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,

for 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 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

KINGS
COLLEGE OF ENGINEERING
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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

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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
2. https://udemy.com/visual-basic-net-step-by-step for beginners
3. https:// www.freevbcode/vb-net-asp-net
4. https:// www.codeproject.com/kb/vb
5. 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

20/8/20

Verified By 20/8/20
HOD/CSE

20/8/2020

Approved by
PRINCIPAL

Format-QP06

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

TÜV Rheinland CERT ISO 9001

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 / Day	1 09.15am - 10.00am	2 10.00am - 10.45am	10.45 am - 11.00 am	3 11.00am - 11.45am	4 11.45am - 12.30pm	12.30 pm - 01.10 pm	5 01.10pm - 01.55pm	6 01.55pm - 02.40pm	7 02.40pm - 03.25pm	03.25 pm - 03.40 pm	8 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. Aleea 20/8/20
HOD

J. Maruthi 20/8/2020.
PRINCIPAL

ACADEMIC YEAR

2019-20 ODD SEMESTER

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

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

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

KINGS COLLEGE OF ENGINEERING
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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE PLAN

Sub.Name	: VB.NET	**Branch / Year / Sem**	: CSE / III / V
Academic Year :	2019-20 (ODD)	**Batch**	: 2017-2021
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
2. https://udemy.com/visual-basic-net-step-by-step for beginners
3. https:// www.freevbcode/vb-net-asp-net
4. https:// www.codeproject.com/kb/vb
5. 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

Verified By
HOD/CSE

22/5/19

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

Format-QP06

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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 - 12.30pm		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

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Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

1.1.3 -VALUE ADDED COURSE

IVA019-REAL TIME ELECTRONICS SYSTEM DESIGN

INDEX

ACADEMIC YEAR 2020-2021

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

26/9/20

DIRECTOR
CENTRE FOR ACADEMIC COURSES

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KINGS COLLEGE OF ENGINEERING

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

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
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

Off: 22357077 / 73
22357074
Fax / Dir : 22352272

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY
CHENNAI - 600 025

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.

Sl.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.

19/8/2020

PRINCIPAL
Kings College of Engineering,
PUNALKULAM - 613 303

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 µVISION4 SOFTWARE TOOL** **6**

Development Tools- µVISION4 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 18/8/2020

19/8/2020
PRINCIPAL
PRINCIPAL
Kings College of Engineering,
PUNALKULAM - 613 303

KINGS
COLLEGE OF ENGINEERING
(NAAC Accredited Institution)
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CERT ISO 9001

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE PLAN

Sub. Code	: IVA019	**Branch / Year / Sem**	: B.E ECE / III /V
Sub. Name	: Real Time electronics system design	**Batch**	: 2018-2022
Staff Name	: Mr.T.Jeyaseelan	**Academic Year**	: 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 **(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 **(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
UNIT I	**REAL TIME ELECTRONICS SYSTEM COMPONENTS**					**(6)**
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
LEARNING OUTCOME At the end of unit, students will be able to • Know the functional components of Real time electronic system. • Understand the concept and architecture of real-time system.						
UNIT II	**CREATING APPLICATIONS WITH µVISION4 SOFTWARE TOOL**					**(6)**
7.	Development Tools	R1	36-37	PPT	2	8
8.	µVISION4 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
LEARNING OUTCOME At the end of unit, students will be able to • Know the basics of µVISION4 Software Tool. • Develop an embedded System for a typical electronic application.						
UNIT III	**HARDWARE DESIGN AND DEVELOPMENT**					**(6)**
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

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

19/8/2020

Principal

PRINCIPAL
Kings College of Engineering,
PUNALKULAM - 613 303

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

CERT ISO 9001

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course. Code	: IVA0019	Branch / Year / Sem	: B.E ECE / III /V
Course. Name	: Realtime Electronics System Design	Batch	: 2018-2022
Staff Name	: Mr. T. IEYASEELAN	Academic Year	: 2020-21 (Odd)

List of Students who Attended the VALUE ADDED COURSE

S.NO	REG.NO	STUDENTS NAME	SIGNATURE
1	821118106001	AARTHI M	M. Aarthi
2	821118106002	AASHA A	A. Aasha
3	821118106004	ABISHEIK P	P. Abisheik
4	821118106005	ANANTH ELA	
5	821118106006	ANANTHAVALLI M	M. Ananthavalli
6	821118106007	ANITHA J	J. Anitha
7	821118106008	ANIZ R K	R. K.
8	821118106009	APARNAA S	
9	821118106010	ARUNKUMAR R	R. Arunkumar
10	821118106011	ANURAJ R	R. Anuraj
11	821118106014	DHIVYAKALKI M	M. Dhivyakalki
12	821118106015	DIVAGAR K	K. Divagar
13	821118106016	DURGA DEVI S	Durga Devi S
14	821118106017	GANESH B	B. Ganesh
15	821118106020	KAWYA A	A. Kawya
16	821118106022	KEERTHIKA M	M. Keerthika
17	821118106023	KIRUTHIKA B	B. Kiruthi
18	821118106024	LATCHAYASRI G	
19	821118106026	MOUNISH RAJIAH D	D. Mounish Rajiah
20	821118106027	NAGESWARI R	R. Nageswari
21	821118106028	NIVETHA C	C.
22	821118106029	NIVETHA T	T. Nivetha
23	821118106030	PRABHU G	G. Prabhu
24	821118106033	PRIYADHARSHINI S	

S.NO	REG.NO	STUDENTS NAME	SIGNATURE
25	821118106034	RAMYA K	
26	821118106036	SANTHIYA S	
27	821118106038	SARIKA A	
28	821118106039	SHEELA T	
29	821118106040	SHOBIGA P	
30	821118106041	SRIMATHI C	
31	821118106042	SURIYA R	
32	821118106043	SUSHMA D	
33	821118106044	THAMILSELVAN B	
34	821118106045	THIRUMURUGAN S	
35	821118106046	VAISHNAVI P V	
36	821118106048	VINOTHA M	
37	821118106049	VINOTHINI G	
38	821118106050	VISHWABHARATHY V	
39	821118106901	ARUNKUMAR K	

13/11/20

COURSE COORDINATOR
(JEYASEELAN.T,AP/ECE)

13/11/20

HOD/ECE

ACADEMIC YEAR

2019-2020

KINGS
COLLEGE OF ENGINEERING
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

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,

10/6/19

PRINCIPAL
Kings College of Engineering
Punalkulam- 613 303.

Encl:

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

Off 22357077 / 73
22357074
Fax / Dir 22352272

CENTRE FOR ACADEMIC COURSES
ANNA UNIVERSITY
CHENNAI - 600 025

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/125/16-19 dated .....

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

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

TUVRheinland 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

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

7/6/19
Staff in-charge
JEYASEELAN.T

HOD/ ECE 10/6/19

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(NAAC Accredited Institution)
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CERT ISO 9001

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 **(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 **(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
UNIT I	**REAL TIME ELECTRONICS SYSTEM COMPONENTS**					**(6)**
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
LEARNING OUTCOME						
At the end of unit, students will be able to • Know the functional components of Real time electronic system. • Understand the concept and architecture of real-time system.						
UNIT II	**PROGRAMMING REAL TIME EMBEDDED COMPUTING SYSTEM**					**(6)**
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
LEARNING OUTCOME						
At the end of unit, students will be able to • Know the basics of embedded C programming and its use in application development. • Develop an embedded C program for a typical electronic application.						
UNIT III	**IO DEVICES -INTERFACING AND PROGRAMMING**					**(6)**
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		

7/6/19

Prepared by

Mr.T.Jeyaseelan

10/6/19

Verified by

HOD/ECE

10/6/19.

Approved by

Principal

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

VALUE ADDED COURSE DETAILS

SUBJECT: EVA002 - ADVANCES IN SOLAR ENERGY TECHNOLOGIES
SEMESTER - V / III - Year EEE

TABLE OF CONTENT

copy to HOD/EEE

Off. 22357077 / 73
22357074
Fax / Dir : 22352272

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY
CHENNAI – 600 025

Dr. R. RAJU
DIRECTOR

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

13.06.2019

19 JUN 2019
1309

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,

13/6/19

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

kv

KINGS
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(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)

TÜVRheinland CERT ISO 9001

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SUBJECT: ADVANCES IN SOLAR ENERGY TECHNOLOGIES

SEMESTER: V

COURSE PLAN (EVA 002)
(Version: 2)

PREPARED BY

Mr. J. AROKIARAJ AP/EEE

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.Arokiaraj
Faculty in-charge

HOD/ EEE

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

TÜVRheinland CERT ISO 9001

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE PLAN

Sub. Code	: EVA002	**Branch / Year / Sem**	: B.E EEE / III /V
Sub. Name	: Advances In Solar Energy Technologies	**Batch**	: 2018-2022
Staff Name	: Mr.J.Arokiaraj	**Academic Year**	: 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 **(Topic No. 27)**

Topic No	Topic	Books for Reference	Page No.	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
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.Arokiaraj

12/8/2020

Verified by

HOD/EEE

Approved by

Principal

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

26/9/20

DIRECTOR
CENTRE FOR ACADEMIC COURSES

22/9/2021

copy to HOD/EEE

Off. 22357077 / 73
22357074
Fax / Dir : 22352272

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY
CHENNAI – 600 025

Dr. R. RAJU
DIRECTOR

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

13.06.2019

19 JUN 2019
1309

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,

13/6/19

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

kv

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

TÜVRheinland® CERT ISO 9001

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SUBJECT: ADVANCES IN SOLAR ENERGY TECHNOLOGIES

SEMESTER: V

COURSE PLAN (EVA002)
(Version: 1)

PREPARED BY

Mr. J. AROKIARAJ AP/EEE

&

Mr. C. JOHN SELVARAJ AP/EEE

SYLLABUS

EE851 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.Arokiaraj & Mr.C.JohnSelvaraj
Faculty in-charge

HOD/ EEE

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

TÜVRheinland CERT ISO 9001

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE PLAN

Sub. Code	: EE851	**Branch / Year / Sem**	: B.E EEE / III /V
Sub. Name	: Advances In Solar Energy Technologies	**Batch**	: 2017-2021
Staff Name	: Mr.J.Arokiaraj & 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 **(Topic No. 27)**

Topic No	Topic	Books for Reference	Page No.	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
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, 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.JohnSelvaraj

Verified by

HOD/EEE

Approved by

Principal

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

26/9/20

DIRECTOR
CENTRE FOR ACADEMIC COURSES

22/9/2021

Department of Mechanical Engineering
Value Added Course

Subject Code: MVA010

Subject Name: ENERGY RESOURCES & MANAGEMENT

Off: 22357077 / 73
22357074
Fax / Dir : 22352272

CENTRE FOR ACADEMIC COURSES
ANNA UNIVERSITY
CHENNAI – 600 025

Dr. R. RAJU
DIRECTOR
Letter No 2813/AU/VA/CAC/2019

01.07.2019

09 JUL 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.

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.

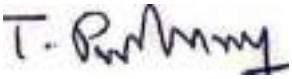
UNIT IV OTHER TYPES OF ENERGY 6

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
CERT ISO 9001

DEPARTMENT OF MECHANICAL ENGINEERING
COURSE PLAN

Sub. Code	: MAV 010	**Branch / Year / Sem:**	B.E. Mech /III/V
Sub. Name	: Energy Resources and Management		
Staff Name	: M. Melwin J Sridhar	**Batch**	: 2018-2022
		Academic Year	: 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. https://prezi.com/7fugbh0ndsub/nuclear-energy-vs-hydro-energy **(Topic No 02)**

W2. www.eolss.net/sample-chapters/c09/e4-23-02.pdf **(Topic No 05)**

W3. https://www.slideshare.net/vanitathakka/solar-radiation-measurement **(Topic No07)**

W4. https://cleanenergyaction.files.wordpress.com-ppt **(Topic No 10)**

W5. www.csun.edu/~psk17793/ES9CP/ES9%20factors_affecting_wind.htm **(Topic No 11)**

W6. https://www.slideshare.net/aslam55/biomass-conversion-technologies **(Topic No 12)**

W7. www.teriin.org/technology/biomass-gasifier **(Topic No 13)**

W8. www.alternative-energy-tutorials.com › Tidal Energy **(Topic No 18)**

W9. https://energy.gov/eere/geothermal/how-geothermal-power-plant-works-Simple **(Topic No 26)**

Topic No	Topic	Books for Reference	Page No.	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
	UNIT I FOSSIL FUEL ENERGY					(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

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

22/9/2022

DIRECTOR (CAC)

22/9/2022

Off: 22357077 / 73
22357074
Fax / Dir : 22352272

CENTRE FOR ACADEMIC COURSES
ANNA UNIVERSITY
CHENNAI – 600 025

Dr. R. RAJU
DIRECTOR
Letter No 2813/AU/VA/CAC/2019

01.07.2019

09 JUL 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

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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.

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.

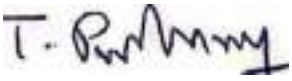
UNIT IV OTHER TYPES OF ENERGY 6

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)
TÜVRheinland CERT ISO 9001

DEPARTMENT OF MECHANICAL ENGINEERING
COURSE PLAN

Sub. Code	: MAV 010	**Branch / Year / Sem:**	B.E. Mech /III/V
Sub. Name	: Energy Resources and Management		
		Batch	: 2017-2021
Staff Name	:S. Sabanayagam	**Academic Year**	: 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. https://prezi.com/7fugbh0ndsub/nuclear-energy-vs-hydro-energy **(Topic No 02)**

W2. www.eolss.net/sample-chapters/c09/e4-23-02.pdf **(Topic No 05)**

W3. https://www.slideshare.net/vanitathakka/solar-radiation-measurement **(Topic No07)**

W4. https://cleanenergyaction.files.wordpress.com-ppt **(Topic No 10)**

W5. www.csun.edu/~psk17793/ES9CP/ES9%20factors_affecting_wind.htm **(Topic No 11)**

W6. https://www.slideshare.net/aslam55/biomass-conversion-technologies **(Topic No 12)**

W7. www.teriin.org/technology/biomass-gasifier **(Topic No 13)**

W8. www.alternative-energy-tutorials.com › Tidal Energy **(Topic No 18)**

W9. https://energy.gov/eere/geothermal/how-geothermal-power-plant-works-Simple **(Topic No 26)**

Topic No	Topic	Books for Reference	Page No.	Teaching Methodology	No. of Hours Required	Cumulative No. of periods
	UNIT I FOSSIL FUEL ENERGY(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
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12	Biomass resources and their classification	R1, W6	197-204	BB PPT	1	13
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- Compare different types of non renewable energy resources.

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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

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FACULTY OF MECHANICAL ENGINEERING

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7.	MVA007	Automation Suite for Smart Systems	2 credit
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21.	MVA021	Modeling and Machining Practice for CNC Machines	2 0 0 2

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