KONGU ENGINEERING COLLEGE

(Autonomous)

PERUNDURAI, ERODE – 638060

DEPARTMENT OF ELECTRONICS AND COMMUICATION ENGINEERING

Date: 22.02.2022

CIRCULAR

The following courses are approved by Curriculum and Development Cell (CDC) for this semester (2021-2022 even). The students may enroll themselves based on their willingness to attend the course. The courses will start from March 2022 onwards.

S.No.	Course Code	Name of the One credit course
1.	18VAC81	ASIC design using Cadence
2.	18VAC69	Real time project development using Image Processing and Machine Learning
3.	20VC015	Modeling and deployment Onto SoC using MATLAB and SIMULINK
4.	20VC024	Biomedical Systems and Wearable Medical Services
5.	18VAC88	System Design using MSP430 microcontroller and Code Composer Studio
6.	18VAC89	Industrial communication standards and measurements
7.	18VAC90	Long range technology for IoT application using LORA WAN
8.	20VC025	Long range technology for IoT application using LORA WAN
9.	18VAC91	QCA design for digital Electronics

22.2.22

Faculty Incharge

22/2/2022

HOD / ECE

51

Estd : 1984

KONGU ENGINEERING COLLEGE
(Autonomous)
PERUNDURAI – 638060
INTERNAL QUALITY ASSURANCE CELL

CERT No.:99-100-20788
ISO 9001 : 2015

Approval for Value Added Course (Two Credits)

Academic Year: 2021 -2022 EVEN Semester

DEPARTMENT OF ECE

Date: 28.04.2022

1.	Academic Year	:	2021 -22	Semester: ~~ODD~~ / EVEN	
2.	Course Title	:	System Design using MSP430 Microcontroller and Code Composer Studio	Credit(s): ~~One~~ / Two	
3.	Type of Course	:	~~Already Offered Course / Updated Course~~ / New Course		
	• If "Already offered course",	:	Course Code: -	Version: -	
4.	Course Coordinator(s)	:	1. Mr. Vibin Mammen Vinod, Assistant Professor (SRG) 2. Ms. P. Gowri, Assistant Professor		
5.	Course offered by	:	Internal faculty / ~~External experts~~		
6.	Name and designation of external resource persons	:	-		
7.	Details about external organiztaion	:	-		

8.	Course fee for external experts	Max. number of students/Batch	Course fee / student
	-	50	Rs. 450/-

9.	No. of days	Period		No. of hours			Venue/ Meet ID
		From	To	Lecture	Practical	Total	
	25	23.05.2022	18.06.2022	15	30	45	Smart Classroom. Department of ECE

10.	Pre-requisites for offering the course	:	Nil		
11.	Course offered to	:	Programme	Branch	Year/Semester
			BE	ECE, EEE, EIE, MTS	III/ VI

12.	Course Main Contents	:		
			Day 1	Introduction to Embedded systems and MSP430
			Day 2	MSP430 CPU Architecture and launchpads
			Day 3	TI Support Ecosystem and MSP430ware
			Day 4	MSP430 Clock and Reset System - Types of Reset sources
			Day 5	DCO setup and calibration
			Day 6	Getting started with Code Composer Studio(CCS)
			Day 7	Programming the MSP430, Addressing modes
			Day 8	Low Power Modes in MSP430
			Day 9	Interfacing LEDs and Switches with MSP430 using Digital Input and Output.

			Day 10	Interfacing Seven Segment Displays and Liquid Crystal Displays with MSP430.
			Day 11	Interrupts – Priorities and Vectors – Interrupts and TI-RTOS scheduling
			Day 12	Handling Interrupts in MSP430. Writing efficient Interrupt Service Routine (ISR)
			Day 13	Introduction to MSP430 Timer Module and it's Modes of Operation.
			Day 14	Timer Capture Modes and PWM
			Day 15	Servomotor interface with MSP430
			Day 16	ADC operation in MSP430.
			Day 17	Analog Sensor Interfacing with MSP430
			Day 18	Adding DAC to MSP430. Custom Waveform generation using MSP430.
			Day 19	UART – RFID Interfacing with MSP430
			Day 20	SPI, I2C – RTC Interfacing
			Day 21	Building USB drivers
			Day 22	IMU interface with MSP430
			Day 23	Building simple electronics projects - MSP430 Based Project Design and Implementation
13.	Course Outcomes	:	After completing the course, the student will be able to: • describe the various families of the TI ecosystem • configure and initialize the different modes of MSP430 core • write C code to configure timer modules of MSP430 • develop MSP430 based embedded applications	
14.	Course Assessment (Min. 2)	:	S. No. / Type / Max. Marks	
			1 – Multiple Choice Questions based Assessment – 50	
			2 – Mini Project – 50	
			Total – 100 Marks	
15.	Verified that the content of this course is not offered to students partially/fully in regular curriculum of respective programme of the student. Certify that the course content, credits and grade are approved in the BOS meeting or approved by internal BOS members and will be ratified in the next BOS meeting			11/5/2020 (Signature of the HoD after verification)
16.	Any other details	:		

The above proposal may kindly be approved.

Course co-ordinators
(VIBIN MANMEN VINOD)

HOD 11/5/2020

Chief Coordinator/Academic 11/5/2020

Encl:

1. Copy of the syllabus of the course

18VACxxx SYSTEM DESIGN USING MSP430 MICROCONTROLLER AND CODE COMPOSER STUDIO

Programme & Branch	BE &ECE, EEE,EIE,MTS	Sem.	Category	L	T	P	Credit
Prerequisites	Microprocessor and Microcontrollers	,6	VAC	1	0	2	2

Preamble	To impart a deep insight and understanding of the MSP430 series microcontrollers and development of embedded system applications for real world	
Unit - I	**MSP430 Basics**	
MSP430 Architecture – CPU – Memory – Peripherals – ULP – LaunchPads – TI Support Ecosystem – Code Composer Studio – Writing MSP430 C code – Using GPIO with MSP430 – MSP430ware – Clocks and Initialization – DCO setup and calibration – Interrupts – Priorities and Vectors – Interrupts and TI-RTOS scheduling		7
Unit - II	**MSP430 Peripherals**	
Timers – Configuration of Timer_A and Timer_B – Timer Driver Lib – Low power optimization – Real time clock – UART – PWM – I2C – ADC - Non volatile memory – Flash and FRAM – Memory Protection – Building USB drivers – Using Energia		8

List of Exercises / Experiments:

1. GPIO interfacing using LED and switch
2. PWM generation using Timer modules
3. Interrupt handling in MSP430
4. Custom waveform generation using DAC
5. Analog sensor Interfacing
6. Motion detector using MSP430
7. RFID interface with MSP430
8. Servomotor interfacing using MSP430
9. RTC interface with MSP430
10. IMU interface with MSP430

Lecture:15 , Practical:30 , Total:45

REFERENCES:

1. John H. Davies, "MSP430 Microcontroller Basics", Newnes, 2008
2. Adrian Fernandez and Dung Dang , "Getting Started with the MSP430 Launchpad", Newnes, 2013
3. MSP430 Design Workshop Student Guide – Texas Instruments, 2015 https://training.ti.com/msp430-workshop
4. http://processors.wiki.ti.com/index.php/MSP430_16-Bit_UltraLow_Power_MCU_Training

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	describe the various families of the TI ecosystem	Understanding(K2)
CO2	configure and initialize the different modes of MSP430 core	Understanding(K2)/ Manipulation (S2)
CO3	write c code to configure timer modules of MSP430	Applying(K3)/Manipulation (S2)
CO4	develop MSP430 based embedded applications	Analyzing(K4)/ Precision (S3)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	1	1	2							2	1	1
CO2	3	3	2	3	3				2		2	2	1	1
CO3	3	3	2	3	3				2		2	2	2	2
CO4	3	3	2	3	3				2		2	2	2	2

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN - THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
MCQ(50 Marks)	20	40	40				100
Mini Project (50 Marks)			100				100

KONGU ENGINEERING COLLEGE, PERUNDURAI – 638060
DEPARTENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
2021-2022 EVEN SEMESTER

One credit course on "System Design using MSP430 Microcontroller and Code Composer Studio"

Course schedule – (Offline)

S.No	Day	Topics	Faculty
1	Day 1	Introduction to Embedded systems and MSP430	VMV
2	Day 2	MSP430 CPU Architecture and launchpads	PG
3	Day 3	TI Support Ecosystem and MSP430ware	VMV
4	Day 4	MSP430 Clock and Reset System - Types of Reset sources	PG
5	Day 5	Getting started with Code Composer Studio(CCS)	VMV
6	Day 6	Programming the MSP430, Addressing modes	PG
7	Day 7	Low Power Modes in MSP430	PG
8	Day 8	Interfacing LEDs and Switches with MSP430 using Digital Input and Output.	PG
9	Day 9	Interfacing Seven Segment Displays and Liquid Crystal Displays with MSP430.	VMV
10	Day 10	DCO setup and calibration	VMV
11	Day 11	Interrupts – Priorities and Vectors – Interrupts and TI-RTOS scheduling	PG
12	Day 12	Handling Interrupts in MSP430. Writing efficient Interrupt Service Routine (ISR)	PG
13	Day 13	Introduction to MSP430 Timer Module and it's Modes of Operation.	PG
14	Day 14	Timer Capture Modes and PWM	PG
15	Day 15	Servomotor interface with MSP430	VMV
16	Day 16	ADC operation in MSP430.	PG
17	Day 17	Analog Sensor Interfacing with MSP430	PG
18	Day 18	Adding DAC to MSP430. Custom Waveform generation using MSP430.	PG
19	Day 19	UART – RFID Interfacing with MSP430	VMV
20	Day 20	SPI, I2C – RTC Interfacing	PG
21	Day 21	Building USB drivers	VMV
22	Day 22	IMU interface with MSP430	VMV
23	Day 23	Building simple electronics projects - MSP430 Based Project Design and Implementation	VMV

VMV - MrVibinMammen Vinod
PG - Ms P Gowri

5/5/22
Co-ordinator
(P Gowri)

5/5/22
HOD/ECE

KONGU ENGINEERING COLLEGE, PERUNDURAI – 638060

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Two credit course on System Design with MSP430 Microcontroller and Code Composer Studio

Duration: 23.05.2022 to 23.06.2022

Class:III ECE

Total No of Hours conducted: 45

Attendance Sheet

S.No.	Name of the participant	Roll Number	No. of hours Present	Attendance Percentage
1	GOBIKRISHNAN M	19ECL225	38	84.44%
2	GOKUL T	19ECL226	39	86.67%
3	SHANDHEEP E	19ECL234	40	88.89%
4	SURESHKUMAR M	19ECL236	40	88.89%
5	ABINIVESH M R	19ECR004	36	80.00%
6	ABIRAMI N V	19ECR005	41	91.11%
7	AKSHAYA K	19ECR007	41	91.11%
8	AMIRTASURYA S	19ECR008	43	95.56%
9	ANANDHU M	19ECR009	38	84.44%
10	ANANTHAKUMAR S	19ECR010	38	84.44%
11	ARAVIND R	19ECR011	43	95.56%
12	ASHWIN RAJ K	19ECR014	42	93.33%
13	ASWANTH R	19ECR015	43	95.56%
14	ASWIN K U	19ECR017	42	93.33%
15	DEEVITHA SHREE M	19ECR025	41	91.11%
16	DHINAKARAN R	19ECR034	43	95.56%
17	DHIWAAGAR P	19ECR035	43	95.56%
18	GOKUL R	19ECR038	43	95.56%
19	GOVARTHANAN S	19ECR041	44	97.78%
20	GOWRISANKAR D	19ECR042	39	86.67%
21	GULNAS N	19ECR044	40	88.89%
22	GUNAL M S	19ECR045	40	88.89%
23	HARI PRASAD M	19ECR049	36	80.00%
24	HARIPRASANTH P	19ECR052	43	95.56%
25	HARISH PRABU P N	19ECR057	42	93.33%
26	KASIRAM P	19ECR076	40	88.89%
27	KISHORE S K	19ECR085	40	88.89%
28	KISHOREKUMAR K A	19ECR086	40	88.89%
29	LOKESH V	19ECR094	41	91.11%
30	MYVIZHLI. P	19ECR110	40	88.89%
31	NAVEEN M	19ECR114	43	95.56%
32	NIDEESH K G	19ECR117	43	95.56%
33	NITHARSAN KS	19ECR119	38	84.44%
34	NITHIN R	19ECR120	43	95.56%
35	PRAGADISH SELVAN R	19ECR127	42	93.33%
36	RUBESH K	19ECR147	44	97.78%
37	SETHURAJAN S	19ECR173	43	95.56%
38	SHIVANAND K	19ECR176	45	100.00%
39	SIVABALAN M	19ECR178	35	77.77%
40	SOWMIYA P	19ECR181	43	95.56%

24/6/22

24/6/22

24/6/22

KONGU ENGINEERING COLLEGE, PERUNDURAI – 638060
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
Two credit course on System Design with MSP430 Microcontroller and Code Composer Studio

Duration: 23.05.2022 to 23.06.2022
Class:III ECE
Total No of Hours conducted: 45

Attendance Sheet

41	SRINITHI V	19ECR187	43	95.56%
42	SUBIKSHNA V	19ECR196	43	95.56%
43	SUDHAN A	19ECR197	43	95.56%
44	SUJITH S	19ECR198	42	93.33%
45	VIBIN T	19ECR209	45	100.00%
46	VIMALAN S S	19ECR215	12	26.67%
47	VIMAL PRASAD M	19ECR216	42	93.33%
48	VIVEKA VARATHAN R	19ECR218	43	95.56%
49	YASWANTH S	19ECR219	42	93.33%
50	YAZHINI B	19ECR220	41	91.11%

1. 24/6/22 (VIBIN MAMMEN VINOD)
2. 24.6.22 (P. GOWRI)

Co-ordinators

HOD/ECE
24/6/22

KONGU ENGINEERING COLLEGE, PERUNDURAI – 638060

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

2021-2022 EVEN SEMESTER

Two credit course on System Design with MSP430 Microcontroller and Code Composer Studio

Duration: Class:III ECE

Mark Sheet

S.No.	Name of the participant	Roll Number	Assessment-1 (50)	Assessment-2 (50)	Total (100)
1	GOBIKRISHNAN M	19ECL225	32	35	67
2	GOKUL T	19ECL226	37	34	71
3	SHANDHEEP E	19ECL234	35	36	71
4	SURESHKUMAR M	19ECL236	38	39	77
5	ABINIVESH M R	19ECR004	44	38	82
6	ABIRAMI N V	19ECR005	35	40	75
7	AKSHAYA K	19ECR007	41	46	87
8	AMIRTASURYA S	19ECR008	36	45	81
9	ANANDHU M	19ECR009	39	42	81
10	ANANTHAKUMAR S	19ECR010	39	43	82
11	ARAVIND R	19ECR011	38	39	77
12	ASHWIN RAJ K	19ECR014	37	36	73
13	ASWANTH R	19ECR015	43	48	91
14	ASWIN K U	19ECR017	34	47	81
15	DEEVITHA SHREE M	19ECR025	34	37	71
16	DHINAKARAN R	19ECR034	43	42	85
17	DHIWAAGAR P	19ECR035	38	43	81
18	GOKUL R	19ECR038	44	47	91
19	GOVARTHANAN S	19ECR041	38	47	85
20	GOWRISANKAR D	19ECR042	28	38	66
21	GULNAS N	19ECR044	36	45	81
22	GUNAL M S	19ECR045	38	44	82
23	HARI PRASAD M	19ECR049	36	45	81
24	HARIPRASANTH P	19ECR052	39	44	83
25	HARISH PRABU P N	19ECR057	34	37	71
26	KASIRAM P	19ECR076	35	37	72
27	KISHORE S K	19ECR085	34	37	71
28	KISHOREKUMAR K A	19ECR086	37	39	76
29	LOKESH V	19ECR094	25	37	62
30	MYVIZHLI. P	19ECR110	37	35	72
31	NAVEEN M	19ECR114	30	39	69
32	NIDEESH K G	19ECR117	40	41	81
33	NITHARSAN KS	19ECR119	32	39	71
34	NITHIN R	19ECR120	29	35	64
35	PRAGADISH SELVAN R	19ECR127	39	42	81
36	RUBESH K	19ECR147	44	43	87
37	SETHURAJAN S	19ECR173	39	43	82
38	SHIVANAND K	19ECR176	44	47	91
39	SIVABALAN M	19ECR178	AB	AB	AB
40	SOWMIYA P	19ECR181	30	42	72
41	SRINITHI V	19ECR187	41	46	87
42	SUBIKSHNA V	19ECR196	30	42	72

24/6/22

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

2021-2022 EVEN SEMESTER

Two credit course on System Design with MSP430 Microcontroller and Code Composer Studio

Duration: Class:III ECE

Mark Sheet

43	SUDHAN A	19ECR197	35	42	77
44	SUJITH S	19ECR198	38	47	85
45	VIBIN T	19ECR209	37	47	84
46	VIMALAN S S	19ECR215	AB	AB	AB
47	VIMAL PRASAD M	19ECR216	37	44	81
48	VIVEKA VARATHAN R	19ECR218	46	47	93
49	YASWANTH S	19ECR219	41	45	86
50	YAZHINI B	19ECR220	38	40	78

1. 24/6/22 (VIBIN MANMEN VINOD)

2. 24/6/22 (P. GOWRI)

Co-ordinators

24/6/22

HOD/ECE