

## SRI CHANDRASEKHARENDRA SARASWATHI VISWA MAHAVIDYALAYA

(University established under section 3of UGC Act 1956) (Accredited with 'A' Grade by NAAC)



CURRICULUM FOR FULL TIME BE - ELECTRONICS AND COMMUNICATION ENGINEERING VALUE ADDED COURSE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

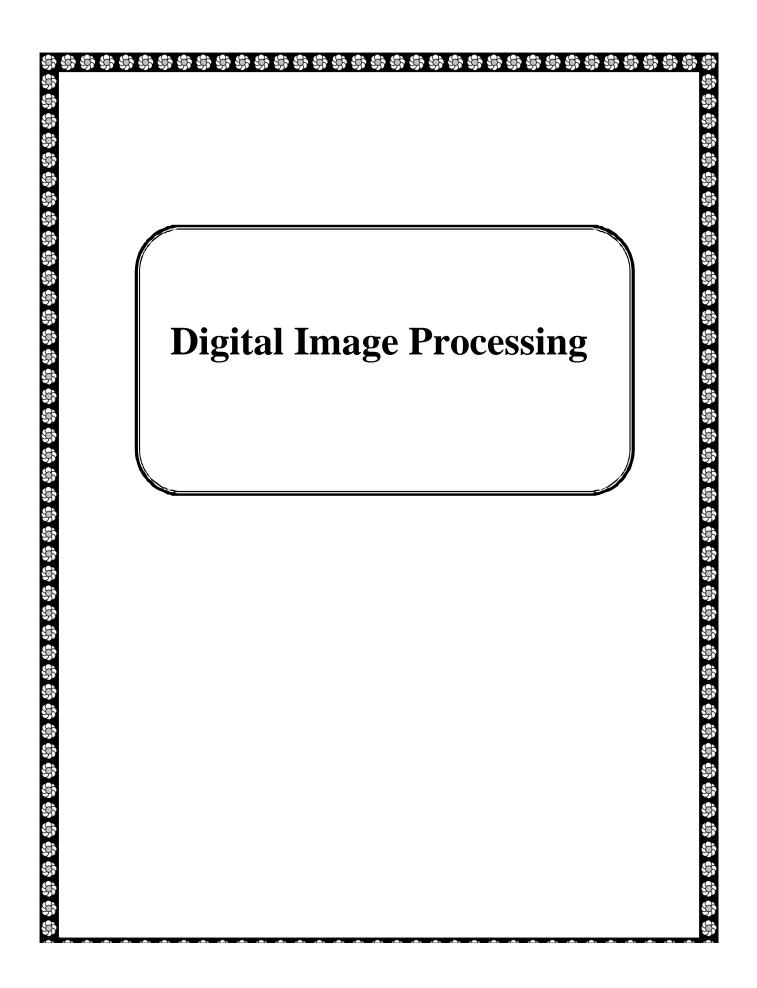




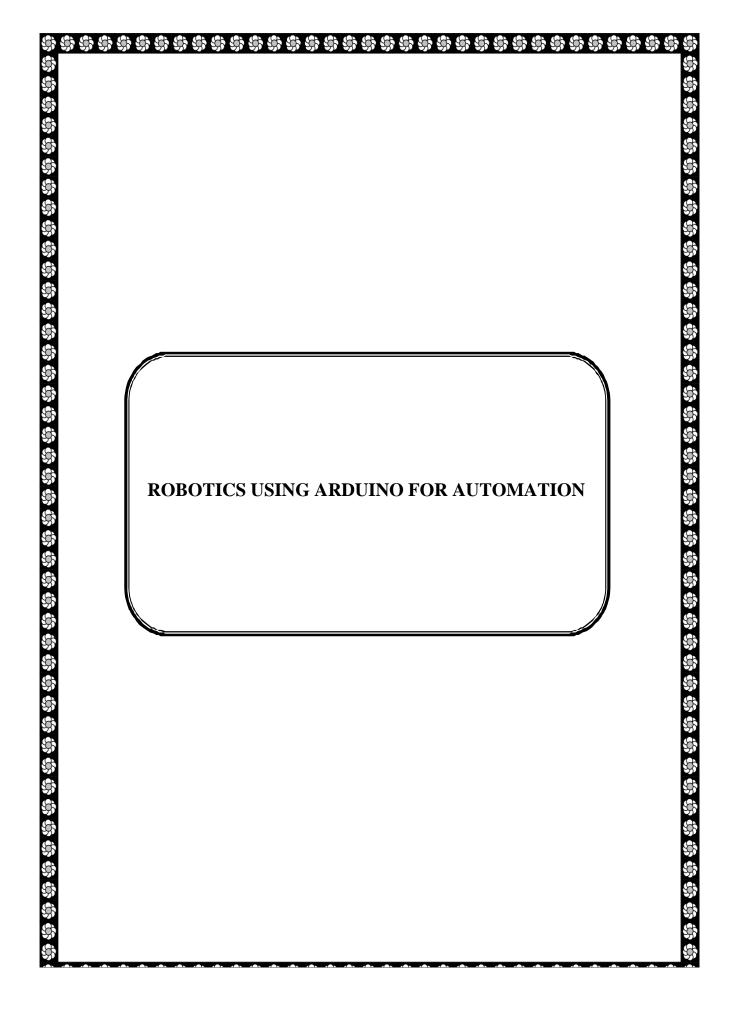
Department of Electronics and Communication Engineering

# Value Added Course-Skill Development Laboratories (Optional)

Year	Name of the course
I year	Digital Image Processing
II year	<b>Robotics Using Arduino For Automation</b>
III year	<b>Real-Time Applications using Python</b>



	SYLLABU						<del>.</del>	
Course Code		L	Т	P	С	IA	EA	TM
Course Name	Digital Image Processing	0	0	3	3	100	-	100
Course	Skill Development program		Sylla	bus Re	visior	1		V.1.0
Category								
Pre-requisite	Basic knowledge on programm	ning la	anguag	ge				
Course Objectiv	ves:							
The course shou	ld enable the students							
1.	To develop expertise in digital	image	e proce	essing u	using	MATI	LAB.	
<b>Course Outcom</b>	nes:							
On completion of	of the course, the student will be a	ble to						
1.	To understand the core concept of	of digi	tal ima	age pro	cessir	ng		
2.	Understand image enhancement	and re	storati	ion tech	nnique	es		
3.	Applying various Ideal filters in	the fre	equenc	y dom	ain an	d unde	erstand	the
	concept of edge detection.							
4.	Compose various Morphological	l opera	tions of	on bina	ry im	ages a	nd gene	erate their
	transformed images.							
LIST OF EXPE	ERIMENTS							
1.	Simulating and Displaying Binar	ry and	Gray	Scale I	Negati	ives		
2. Impleme	ntation of Relationships between	Pixels	5					
	aling and rotation							
4. Image en	nhancement by contrast stretching	g and l	Histog	ram eq	ualiza	ation		
5. display o	f bit planes of image							
	of FFT (1-D & 2-D) of an image							
	tion of mean, Standard Deviation							
	ntation of Image Smoothening Fi							
•	ntation of image sharpening filter							filters
	ntation of Image Intensity slicing lge detection Algorithm	techn	ique i	or imag	ge enn	ancem	lent	
12. Image fli	<u> </u>							
13. Mini Proj	*							
				T	otal H	Iours	45 Ho	ours
Text Book(s)							I	
. ,	zalez and R.E. Woods, Digital In	nage F	Process	sing, Se	econd	Editio	n, Pear	son
Education		0		U,			,	
2008								
2. Anil Kun edition, 2	nar Jain, Fundamentals of Digital 2004	Imag	e Proc	essing,	Prent	ice Ha	ll of In	dia, 2nd
<b>Reference Book</b>	s(s)							
	zalez and R.E. Woods, Digital In	nage F	Process	sing us	ing M	atlab,	Second	Edition,
Pearson I	Education, 2011							

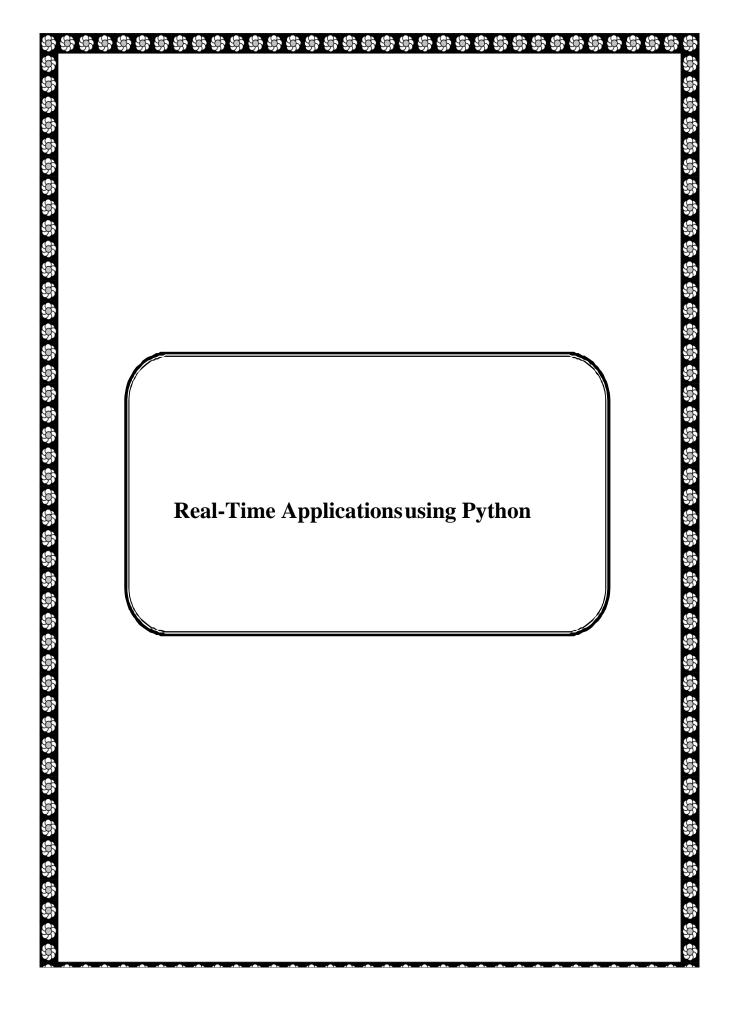


		SYLLAR	BUS						
Course	Code		L	Т	Р	С	IA	EA	TM
Course l	Name	ROBOTICS USING	0	0	3	3			-
		ARDUINO FOR							
		AUTOMATION							
Course		VALUE ADDED COURSE		Sylla	bus Re	visior	1	V	7.1.0
Categor	y								
Pre-requ	ıisite	Basic knowledge of Electronic	s and	Comp	uter pr	ogran	nming		
Course	Objecti	ves:							
The cour	se shou	ld enable the students							
		1. To develop expertise in embe	edded	progra	amming	g usin	g Ard	uino	
		microcontroller.							
Course	Outcon	ies:							
On comp		of the course, the student will be al							
		Learn embedded programming fro		-		-		•	
		Learn to use Liquid Crystal Displa	•						
		Understand the definition and sign				otics	•		
		Opens up the gateways of innovati							
	5. I	Recognize the factors that contributed and the second seco	ite to	the em	nergenc	e of I	Roboti	cs.	
LIST O	F EXPI	ERIMENTS							
1.		Prototyping Basics							
a	)	Fundamentals of Electronics.							
b	)	Essential Tools: Breadboard and	jump	er wire	es etc.				
c	)	Introduction to Microcontroller.							
d	)	Introduction to Embedded Syster	ns abo	out Ar	duino U	Jno E	Board.		
2. P	rogram	ming Basics							
a	U	ng Started with Arduino IDE.							
b		cs of 'C' Programming.							
c	) Data	e e							
		Operations in Arduino							
	-	rol LED indications.							
b	) Cont	rols relay output.							
4. A	nalog (	Operations in Arduino							
a	-	perature measurement.							
b	) Dista	nce measurement.							
5. N	lotor D	river operations with Arduino							
a	) Moto	or driver to control DC motor.							
b	) Cont	rol the direction of the spin of Serv	vo mo	otor.					
		operations with Arduino							
a	) Using	g Liquid Crystal Display.							
b	) Usin	g Light Emitting Diode Matrix.							

- 7. Design of water management system for automation using Arduino.
  - a) Water level indication.
  - b) Automatic Turn ON/OFF pump motor.

Total Hours 30 Hours

Text Book(s)							
Brian W. Evans "Arduino Programming Notebook" Second Edition, September 2008,							
Mark Geddes "Arduino Project Handbook 25 practical projects to get you started"							
William Pollock publisher, 2019.							
Reference Book(s)							
http://www.arduino.cc							
http://www.wiring.org.co							
http://www.arduino.cc/en/Booklet/HomePage							
http://cslibrary.stanford.edu/101/							



<b>Course Code</b>		L	Т	Р	С	IA	EA	TM
Course Name	<b>Real-Time</b> Applications	1	0	1	2	100	-	100
	using Python							
Course	Value Added Course	Syllabus Revision V.1.0		7.1.0				
Category								
Pre-requisite	Basic Programming Knowledge	e						

#### **Course Objectives:**

The course should enable the students

- 1. To know basic data engineering concepts and supporting libraries in Python
- 2. To understand various image processing techniques
- 3. To integrate hardware and software components using python
- 4. To understand basic classification algorithms and their implementation
- 5. To improve the employability skills of engineering students.

#### **Course Outcomes:**

On completion of the course, the student will be able to

- 1. Apply data engineering concepts to prepare the data for analysis
- 2. Explore various image processing techniques
- 3. Integrate hardware and software components using python
- 4. Implement basic classification, algorithmic models
- 5. Develop their employability skills.

### Experiments

	1					
1.	Introduction to Python					
	Python Libraries					
	Basic programming -Image Processing					
2.	Cryptography Encode and Decoding					
3.	GUI Implementation ➤ Alarm Clock					
4.	Hardware Interfacing (Using Kit: Arduino) ➤ Switching of LED					

5.	Detection of Electrical Faults				
	> KNN				
6	Heart rate Classification				
	Decision Tree Classifier				
7	Earth Quake Prediction				
	Random Forest Classifier				
8	Hardware Interfacing (Using Kit: Raspberry Pi)				
Too	ls				
1	Python 3.10				
2	Anaconda Environment				
3	Arduino Board				
4	Raspberry-Pi Kit				
5	Computer with a powerful CPU/GPU, a minimum of 8GB of RAM, and large storage				
	capacity.				
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Ref	erence Book:				
1.	Jake Vander Plas, "Python Data Science Handbook", O'Reilly, 2016				
2.	Andreas C. Muller, "Introduction to Machine learning with Python", O'Reilly, 2016				
3.	John Paul Mueuller, Luca Massaron, "Python for Data Science for Dummies",				
	Wiley,2019				
4.	Samir Madhavan, "Mastering Python for Data Science", 2015				