

### MAHARASHTRA INSTITUTE OF TECHNOLOGY, AURANGABD

### An Autonomous Institute Affiliated to Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, Maharashtra (India)

Syllabus of Bachelor of Vocation
In
Artificial Intelligence and Robotics

**Under Choice Based Credit System (CBCS)** 

Under Faculty of Science and Technology

(Effective from 2022-23 and onwards)

### Curriculum for B. Voc AI & ROBOTICS

NSQF	Level -5							V	Semes	ter -I
Sr.	Course	Course Title	Credit		ntact /Wk		Evalua	tion Scheme		ESE
No.	Code	Course Thie		L	P	MSE	TA	ESE	Total	nour
Theory	,									
1.	VAI101	Communicative English	3	3	-	10	15	25	50	1.5
2.	VAI102	Basics of Electronics	3	3	-	10	15	25	50	1.5
3.	VAI103	Fundamentals of Artificial Intelligence	3	3	-	10	15	25	50	1.5
4.	VAI104	Control System	3	3	-	10	15	25	50	.1.5
Lab/Pi	actical									,
5.	VAI121	Basics of Electronics Lab	1.5	-	2	-	25	25	50	-
6.	VAI122	Control System Lab	1.5	-	2	-	25	25	50	-
On Jol	Training (C	OJT)/Qualification Packs*								
	VAI131	Technical support Engineer (SSC /Q5101)	15	_	7-8		50	150	200	-
7.	VAI132	Mechatronics Maintenance Specialist(ELE/Q7105)	13		weeks		50			

NSQF	Level -5								Semes	ter -II
Sr.	Course	Course Title	Credit	100	ntact r/Wk		Evalua	tion Scheme	•	ESE
No.	Code	Course Tide		L	P	MSE	TA	ESE	Total	Hour
Theory	у									
1.	VAI151	Programming in Python	3	3	-	10	15	25	50	1.5
2.	VAI152	Data Structure & Algorithms	3	3	-	10	15	25	50	1.5
3.	VAI153	Basics of robotics	3	3	-	10	15	25	50	1.5
4.	VAI154	Digital Electronics	3	3	-	10	15	25	50	1.5
Lab/P	ractical									
5.	VAI171	Programming in Python Lab	1.5	-	2	-	25	25	50	-
6.	VAI172	Digital Electronics Lab	1.5	-	2	-	25	25	50	-
On Jo	b Training (C	OJT)/Qualification Packs*								
-	VAI181	Industrial Auto Specialist IAS/Q8005	15		7-8		50	150	200	
7.	VAI182	Test Engineer (SSC/Q7001) ·			weeks					-0

H DOVE

2 Phil

Dean
Academics
Anabarashtra Institute of Technology

Chairman Academic Council

MIT Aurangabad

Institute)

NSQF	Level -6								Semes	ster -1
Sr.	Course	Course Title	Credit		ntact ·/Wk		Evaluatio	on Scheme		ESE hour
No.	Code	Course Time	2	L	P	MSE	TA	ESE	Total	nour
Theory	у								`	
1.	VAI201	Electrical Machine and Drives	3	3	-	10	15	25	50	1.5
2.	VAI202	Neural Network and Fuzzy Logic	3	3	-	10	15	25	50	1.5
3.	VAI203	Microcontroller for Robotics	3	3	-	10	15	25	50	1.5
4.	VAI204	Sensors and Signal Conditioning	3	3	-	10	15	25	50	1.5
Lab/P	ractical									
5.	VAI221	Electrical Machine and Drives Lab	1.5	-	2		25	25	50	-
6.	VAI222	Microcontroller for Robotics Lab	1.5	-	2		25	25	50	-
On Jo	b Training (C	OJT)/Qualification Packs*								
7.	VAI231	Master Trainer for junior Software Developer (SSC/Q0509)	15	-	7-8 weeks		50	150	200	-
	VAI232	AI Data Quality Analyst (SSC/ Q8101) raining as per guidelines of AICTE & S								

ir.	Course	Course Title	Credit		ntact r/Wk		Evaluati	on Scheme		ESE
No.	Code	Course Title		L	P	MSE	TA	ESE	Total	noui
Theory										
1.	VAI251	Mechatronics	3	3	-	10	15	25	50	1.5
2.	VAI252	Machine Learning	3	3	-	10	15	25	50	1.5
3.	VAI253	AI for Robotics	3	3	-	10	15	25	50	1.5
4.	VAI254	R Language	3	3	-	10	15	25	50	1.5
	ractical									
5.	VAI271	Machine Learning Lab	1.5	-	2	-	25	25	50	-
6.	VAI272	R Language Lab	1.5	-	2	-	25	25	50	-
		OJT)/Qualification Packs*								,
	VAI281	Master Trainer for soft Dev (SSC/Q0509)	15		7-8		50	150	200	-
7.	VAI282	1(SSC/()X606)	t		weeks					
*Any	one On-Job-T	raining as per guidelines of AICTE & SS	SC for the	giver	skill sets	s for 150	Marks Exte	rnal Assess	ment by NS	SDC/SS
									Mast	er
								The same of		AND DESCRIPTION OF THE PERSON NAMED IN

Dean

Academics

Academics

Academics

Academics

Academics

Chairman Academic Council
MIT Aurangapad
(An Autonomous Institute)

NSQF	Level -7								Semes	ter –I
Sr.	Course	Course Title	Credit		ntact /Wk		Evaluation	on Scheme		ESE hour
No.	Code	Course Title	Creat	L	P	MSE	TA	ESE	Total	nour
Theor	V							•		
1.	VAI301	Embedded OS	3	3	-	10	15	25	50	1.5
2.	VAI302	Wireless Sensor Network for Robotics	3	3	-	10	15	25	50	1.5
3.	VAI303	Business Analytics	3	3	-	10	15	25	50	1.5
4.	VAI304	Entrepreneurship Development	3	3	-	10	15	25	50	1.5
Lab/P	ractical									_
5.	VAI321	Wireless Sensor Network for Robotics Lab	1.5	-	2	-	25	25	50	-
6.	VAI322	Business Analytics Lab	1.5	-	2	-	25	25	50	-
On Jo	b Training (	OJT)/Qualification Packs*								_
	VAI331	Associate Analytics (SSC/Q2101)	15		7-8		50	150	200	-
7.	VAI332	Robotics Automation Lead		-	weeks					

NSOF I	Level -7								Semes	ter –II
Sr.	Course		Credit	1	ntact r/Wk		Evaluati	ion Scheme		ESE hour
No.	Code	Course Title	Crean	L	P	MSE	TA	ESE	Total	Hour
Theory										1.5
1.	VAI351	Deep Learning	3	3	-	10	15	25	50	1.5
2.		Mobile Robotics	3	3	-	10	15	25	50	1.5
Lab/Pra										130.2
3.	VAI371	Project	9	-	4	-	100	100	200	-
On Job		OJT)/Qualification Packs*								
	VAI381	AI Data Engineer (SSC/Q8106)	15		7-8		50	150	200	-
4.	VAI382	Software Engineer (SSC/Q4601) raining as per guidelines of AICT			weeks					

Master Copy

OF HDOVE

4 Dean
Academics
Maharashtra Institute of Technology
Aurangabad.

Chairman Academic Council
MIT Aurangabad
(An Autonomous Institute)

# Maharashtra Institute of Technology, Aurangabad. (An Autonomous Institute) B.Voc. (Artificial Intelligence and Robotics)

NSQF I	Level-5 VAI101: Communicative	English	*	Semester-	I
Te	aching Scheme		Examinat	ion Scheme	
Lectures	03 hrs/Week	MSE		10 Marks	
Practical	-	TA		15 Marks	
Credits	03	ESE		25 Marks	
Civario		Durati	on of ESE	1.5 hours	
	Outcomes (CO)				
Students	will be able to				
1.	To build up the learners confidence	in oral and inter	personal con	mmunication by	
	reinforcing the basics of pronunciat	ion			
2.	To introduce learners to Language	e Skills to find e	employmen	t in the corporate	3.
Unit		e Content		Hou	
Unit 1	Communication: Meaning, Import	ance, and Proces	s, Objective	es of 00	5
	Communication, Effective Commu	nication.			
Unit 2	Preparation of Extempore speech:	Group Discussion	n. Dehates.	00	6
Unit 2					
	Declamation; Stage Confidence, Br	usiness Correspo	ndence: De	finition,	
	Importance Business letters.				
Unit 3	Personality Development: Types	of personality	, Dynamics	s of 0	6
	Personality, Personality Traits,	Influences of	n Persona	ality,	
	Personality Analysis through body				
Unit 4	Memory Training: Mind and menta	al development,	Mental Bloo	cks, 0	6
	Manners and Art of Living.				
Text/Re	ference Books				
Sr. No.	Book	Author		Publisher.	
1	The Written Word,	Vandan	Oxford Un	iversity Press, 20	06.
		R.Singh			
2.	Succeeding through Communication,	Subhash Jagota	Excel book	as, 2009.	

### Maharashtra Institute of Technology, Aurangabad. (An Autonomous Institute)

B.Voc. (Artificial Intelligence and Robotics)

MbQI I	Level-5 VAI102- Basi	cs of Electronics	Semester-I
Te	aching Scheme	Exa	umination Scheme
Lectures	03 hrs/Week	MSE	10 Marks
Practical	25ts (* 24 l	TA	15 Marks
Credits	03	ESE	25 Marks
	aus 12 1   3293a mi	Duration of E	ESE 1.5 hours
	Outcomes (CO) will be able to		Course Outcomes (CO)
1.	To know fundamental sk	ills to understand the basics of Ele	ectronics
2.	To know fundamental sk transistor, FET, MOSFE	tills to understand semiconductor a T	and components like diode,
Unit	And	Course Content	Hours
Unit 1		esistance, Ohm's law, V-I Characteris	
		tage and Current sources, Symbols and AC, DC, Cells and Batteries, Energy	
Unit 2	representation Overview of Basics of Semiconductor and Photo-electric emissio depletion layer, Forward temperature, Zener diode,	f AC, DC, Cells and Batteries, Energy: Semiconductor materials, Metals ann.N-type and P-type semiconductor.  d & Reverse bias, V-I Character, Photo diode, LED, Types and apprenticular	y and Power. and Semiconductors 06 PN junction diode, eristic, Effects of
Unit 2 Unit 3	Basics of Semiconductor and Photo-electric emissio depletion layer, Forward temperature, Zener diode, Diode as a rectifier, half will be	f AC, DC, Cells and Batteries, Energy: Semiconductor materials, Metals ann.N-type and P-type semiconductor.  d & Reverse bias, V-I Character	y and Power.  and Semiconductors PN junction diode, eristic, Effects of olications of diode.  ansistors, Biasing of 06
LANCE STORY	representation Overview of Basics of Semiconductor and Photo-electric emission depletion layer, Forward temperature, Zener diode, Diode as a rectifier, half with Bipolar Junction Transis BJT. CB, CE and CC configuration Transistor Amplifier and CC configuration	f AC, DC, Cells and Batteries, Energy: Semiconductor materials, Metals ann.N-type and P-type semiconductor.  d & Reverse bias, V-I Characte, Photo diode, LED, Types and appave and full wave rectification.  tor: Operation of NPN and PNP traiguration Introduction to FET, JFET, Ind Applications: Introduction, Sing to Oscillators Introduction to Thyri	y and Power.  and Semiconductors PN junction diode, eristic, Effects of polications of diode.  ansistors, Biasing of MOSFET.  gle and Multi-stage 06
Unit 3 Unit 4	representation Overview of Basics of Semiconductor and Photo-electric emission depletion layer, Forward temperature, Zener diode, Diode as a rectifier, half with Bipolar Junction Transis BJT. CB, CE and CC confirmants of Transistor Amplifier and amplifiers Introduction to	f AC, DC, Cells and Batteries, Energy: Semiconductor materials, Metals ann.N-type and P-type semiconductor.  d & Reverse bias, V-I Characte, Photo diode, LED, Types and appave and full wave rectification.  tor: Operation of NPN and PNP traiguration Introduction to FET, JFET, Ind Applications: Introduction, Sing to Oscillators Introduction to Thyri	y and Power.  and Semiconductors PN junction diode, eristic, Effects of polications of diode.  ansistors, Biasing of MOSFET.  gle and Multi-stage 06
Unit 3 Unit 4	representation Overview of Basics of Semiconductor and Photo-electric emission depletion layer, Forward temperature, Zener diode, Diode as a rectifier, half with Bipolar Junction Transis BJT. CB, CE and CC confit Transistor Amplifier and amplifiers Introduction of SCR, LASCR, DIAC, TRI	f AC, DC, Cells and Batteries, Energy: Semiconductor materials, Metals ann.N-type and P-type semiconductor.  d & Reverse bias, V-I Characte, Photo diode, LED, Types and appave and full wave rectification.  tor: Operation of NPN and PNP traiguration Introduction to FET, JFET, Ind Applications: Introduction, Sing to Oscillators Introduction to Thyri	y and Power.  and Semiconductors PN junction diode, eristic, Effects of polications of diode.  ansistors, Biasing of MOSFET.  gle and Multi-stage 06
Unit 3 Unit 4 Text/Ref	Basics of Semiconductor and Photo-electric emissio depletion layer, Forward temperature, Zener diode, Diode as a rectifier, half wa Bipolar Junction Transis BJT. CB, CE and CC confit Transistor Amplifier an amplifiers Introduction to SCR, LASCR, DIAC, TRI erence Books	f AC, DC, Cells and Batteries, Energy: Semiconductor materials, Metals a n.N-type and P-type semiconductor. d & Reverse bias, V-I Characte, Photo diode, LED, Types and appave and full wave rectification. tor: Operation of NPN and PNP traiguration Introduction to FET, JFET, Ind Applications: Introduction, Sing to Oscillators Introduction to Thyrical Author	y and Power.  and Semiconductors PN junction diode, eristic, Effects of polications of diode.  ansistors, Biasing of MOSFET. gle and Multi-stage astors, PNPN diode,

Master Copy

HDOVE

## Maharashtra Institute of Technology, Aurangabad. (An Autonomous Institute)

B.Voc. (Artificial Intelligence and Robotics)

Modi	Level-	5 VAI103 : Fu	ndamentals of	Artificial Intelligence	Seme	ster-I
Т	eaching	Scheme		Examina	tion Scheme	ta I
Lectures		03 hrs/Week		MSE	10 Marks	251111
Practica		1		TA	15 Marks	LEPLIS
Total Cı	100	03		ESE	25 Marks	alito
	KILICH	.1 265 191		Duration of ESE	1.5 hours	
	s will be				(C.C.) of chicked the	R) aetu debu u
1.	To pro	vide an introduc	ion to the basi	c principles of AI	MUL WORLD	
2.	To pro	vide functional e	lements of AI	lamental skills to ambirete	neit word of	
Unit			Course	Content	da intelenar	Hours
Unit 1	Introd	uction to Artifici	al Intelligence:	: What is Artificial		06
		gence, Foundation A.I Representation		of AI, agents, Applications	Voltage and C apacitors, Inception	
Unit 2	Progra	luction to Artific ms - Blind Search Programming.	cial Intelligence or Depth First	e: Issues in Design of Sear t search, Breadth First Sear	rch ch,	06
Unit 2 Unit 3	Progra Logic I	ms - Blind Search Programming. duction to Prolog g a Prolog Progra	or Depth First g: Introduction am, Structure o	to Logic Programming by f PrologProgram	Prolog,	06
Unit 3 Unit 4	Progra Logic Intro Writin Heuri Metho	ms - Blind Search Programming. duction to Prolog g a Prolog Progra stic Search Te ods - Generate and	g: Introduction um, Structure o chniques -I:	to Logic Programming by f PrologProgram Heuristic Search, Heur	Prolog,	
Unit 3 Unit 4	Intro Writin	ms - Blind Search Programming. duction to Prolog g a Prolog Progra stic Search Te ods - Generate and	g: Introduction um, Structure o chniques -I:	to Logic Programming by f PrologProgram: Heuristic Search, Heuribing.	Prolog,	06
Unit 3 Unit 4	Progra Logic Intro Writin Heuri Metho	ms - Blind Search Programming. duction to Prolog g a Prolog Progra stic Search Te ods - Generate and	g: Introduction um, Structure o chniques -I:	to Logic Programming by f PrologProgram Heuristic Search, Heur	Prolog,	06
Unit 3 Unit 4 Referen	Intro Writin Heuri Metho Book	ms - Blind Search Programming. duction to Prolog g a Prolog Progra stic Search Te ods - Generate and	g: Introduction um, Structure o chniques -I:	to Logic Programming by f PrologProgram: Heuristic Search, Heuribing.	Prolog,	06

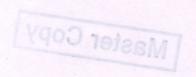
Master Copy

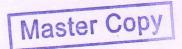
HDOVE

## Maharashtra Institute of Technology, Aurangabad. (An Autonomous Institute)

B.Voc. (Artificial Intelligence and Robotics)

NSQF	Level-5	VAI104 : Contr	ol System	Milit: Laborato	Seme	ster-I
Te	eaching S	Scheme	AT	Examinat	ion Scheme	lenimes
Lectures	f plant	03 hrs/Week	M	ISE	10 Marks	ptibay
Practical		- te	amireny 3 to tel 1	A	15 Marks	nie w
Total Cre	edits	03	E	SE	25 Marks	
			D	uration of ESE	1.5 hours	
Course ( Students			istors.	v and PMP prans	Study NP	2
1.	To cons	struct a system tha	t has a desirable respo	nse to standard	inputs.	
2.	Unders	tand the LTI syste	m		The Carrier	
Unit			Course Content	OI OHE DYEN HE	II IU (UUDE	Hours
Unit 1	Introdu	ection: Motivation,	examples of control syst	ems, feedback co	ntrol	- 03
	systems			DARC	Study of I	ø
Unit 2	Mathen mechani	natical modeling-I: ical systems, Laplac	Mathematical modeling te transforms, transfer fu	g of: electrical sys inctions.	tems,	06
Unit 3	Mathen Signal f	natical modeling-II	: Block diagrams, block gain formula. Linearity	diagram reduction	ons.	07
Unit 4			asic idea of feedback co	ntrol systems. Err	or analysis.	06
		D, PID controllers.				
Referen	ce Book					
Sr. No.	Book		Author	Publisher		
1	Modern	Control Engineerin	g Ogata K	Prentice-H	all of India	Pvt Ltd.,
				New Delhi	, 3rd edition	, 2000
2.	Automa	tic Control Systems	, Kuo B.C.		Iall of India F ni, 6th edition	
3.	Control	System Engineering	g I J Nagr Gopal	ath New a	age Internationublicion.at	nal







### Maharashtra Institute of Technology, Aurangabad. (An Autonomous Institute)

B.Voc. (Artificial Intelligence and Robotics)

NSQF I	Level -5	VAI121: Laborat	tory of Basic F	Electronics-Lab	Semest	er-I
	aching S			Exam	ination Scheme	
Practical		2 Hours/week		TA	25 Marks	T.
Credits	Credits 1.5		314	ESE/PE	25 Marks	2019)
Sr.No.	EXILIE		List of I	Experiments		lapito
1		of Laboratory Instruction of Laboratory Inst		loscope, Function (	Generator, Digital	nO le
2	Study	NPN and PNP tran	nsistors.		of olds ad Iffw	
3	Study	of Diode characteri	istic	ysican unat has a des	E REPORTED OF EACH	
4	Study	of half wave and i	full wave rec	tifier.	ON HOSEOGRAPS	
5	Study	of SCR.	f control system	obygion, examples o	Introduction: M	1
6	Study	of DIAC.			s insuface.	
7	Study	of BJT				
8	Study	of FET				

	P, PI, PD, PID controllers.	
	o Hook e	
	Modern Control Engineering	
New Age International publicion at		

Master Copy

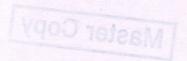


H DOVE

## Maharashtra Institute of Technology, Aurangabad. (An Autonomous Institute)

B.Voc. (Artificial Intelligence and Robotics)

NSQF L	evel -5 VAI122: Laboratory	Semester-I			
Te	aching Scheme	Exan	nination Scheme		
Practical	2 Hours/week	TA	25 Marks		
Credits	1.5	ESE/PE	25 Marks		
Sr.No.		List of Experiments	07.H		
1	Study of open loop system	a Job TrainiagOpainiarT dol. a			
2	Study of close loop system	resonug scheme ical   7-8 weeks			
3	Study of Feedback in Control Syst	tems	E1   E1		
4	Transfer Function &System Respo	onse	133   Technical Will 132   Mechanonics M		
5	Mathematical Modeling of Physical Systems				
6	Study of PI Controller				
7	Study of PID Controller				



## Maharashira Institute of Technology, Aurangabad. (An Autonomous Institute) S. Voc. (Artificial Intelligence and Robotics)

G. S. Mandal's

### Maharashtra Institute of Technology, Aurangabad. (An Autonomous Institute)

B.Voc. (Artificial Intelligence and Robotics)

NSQF Leve	el -5 On Job Trai	ning/Qualification Packs*	Semester-I
Teaching Scheme		Exami	nation Scheme
Practical	7-8 weeks	TA	50 Marks
Credits 15		ESE/PE	150 Marks

VAI131	Technical Writer (SSC/Q0505)
VAI132	Mechatronics Maintenance Specialist(ELE/Q7105)

<sup>\*</sup>Any one On-Job-Training as per guidelines of AICTE & SSC for the given skill sets for 150 Marks External Assessment by NSDC/SSC

Master Copy



H DOVE

### Maharashtra Institute of Technology, Aurangabad.

### (An Autonomous Institute)

B.Voc. (Artificial Intelligence and Robotics)

NSQF Level-5 VAI151: Program		VAI151 : Programmi	ng In Python	00 838 W 18	Semester-	II
T	eaching S	Scheme		Exan	nination Scheme	U105.1
Lectures		03 hrs/Week	MSE		10 Marks	DETH
Practical		inivi uz j	TA		15 Marks	IMOL
Total Cr	edits	03	ESE		25 Marks	
	and the same		Duratio	on of ESE	1.5 hours	1000
	Outcome will be a Build b		damental programmii	ng construc	ets like variables	.f
2.		asic programs skills	MANUAL DE LEVE A			MU .
3.			· Jeanstein J. Manaria	SIA DIES O	os moramonaras 1	mu
Unit	- I asso	towns ushmid makensus	Course Content	and the lease	Relati her same	Hours
Unit 1	Introduction to Python: Python overview; Getting started with python, Comments, Identifiers, Reserved keywords, Variables, Standard Data Types, Operators, Statements and Expressions.					
Unit 2	Functi Parame	ons: Built-in Functions, eters and Arguments.	I SH DHE HEIDD YORSU	moet mentr	ARRIYSIS OF RIGO	06
Unit 3	Strings	s and Lists : Strings - Con	mpound Data type, len	Function,	String Slices.	06
Unit 4	Tuples Tuple	and Dictionaries Tup Assignment, Tuples as R	les -Creating Tuples, eturn Values, Basic Tu	Accessing iples Opera	g Values m Tuples, tions,	07
Referen	ce Book	und Aust Smules pay Sun	THE ID SELVE I SHOULD	Day gam	T   Scarcing 91 20	neu
Sr. No	Book	Transcription of the second	Author	e man Kana	Publisher	
1.		ction to Computing and Solving Using Python,	E.Balagurusamy	to sometring the	McGraw Education edition	Hill First
2.	Core Py	ython Programming	R. NageswaraR	ao	Dreamtech Press	

Master Copy

G. S. Mandal's

Master Copy

H DOVE

# Maharashtra Institute of Technology, Aurangabad. (An Autonomous Institute) B.Voc. (Artificial Intelligence and Robotics)

NSQF Level-5 VAI152: Data Structure & Algorithms

Teaching Scheme
Lectures 03 hrs/Week
Practical - Examination Scheme

MSE 10 Marks
TA 15 Marks

-	Lectures	Acres	03 hrs/Week	*	MSE		10 Marks	
I	Practical		-MATA		TA		15 Marks	
1	Total Cre	edits	03		ESE		25 Marks	
			Prot // >c	doi:	Duration	of ESE	1.5 hours	all I
-	Course (	Outcon	nes (CO)	Taraca T				
	Students						455	
	1.		ovide the knowledge o				at alds ad	il
	2.	To de	evelop skills to apply ap			problen	n solving.	.61
	Unit				se Content		to 14 miles of the	Hours
	Unit 1	operate arrays Function function manip Analy	duction to C and Algo tors and control structure and string manipulation ions: Parameter passing ons and pointers, funct pulations using Arrays, passis of algorithm: frequent thm, Time complexity	e in c(do n, structu call by ion retu pointer t ency co	ecision, loop and cas are, union, enumeration value and call by re- rning pointer, pointer o pointer, Dynamic in unt and its importar	e), function, bitwiseference, er to functioner in an	ons, macros, se operations scope rules, ction, String management. allysis of an	06
	Unit 2	methor Fibon compl Conce	ching & Sorting and Sorting and sorting and sorting and sorting and sorting materials of each searching at the search operation.  Applications: Reversiration	rting, So ethods: and sorti ons, Arra	orting methods: Line Bubble, insertion, se ng Algorithms and Ha ay representation of s	ar, binary election, in ashing Te stacks, St	y search and merge, Time chniques. ack as ADT,	06
	Unit 3	Queu queue data, S Conce using Repre	ses & Linked Lists: Cor s, Queue as ADT, Circul Simulation of queues ept of linked organization linked list, doubly linked esentation and manipulation	ar queue n, singly l list, cir ons of p	es, Application of que linked list, stack using cular linked list, Link olynomials using link	ues: Cate g linked l ed list as	gorizing ist, queue ADT.	06
	Unit 4	Conce a bina Basic matrix Trave Algor		presenta rees (BS gy, Sequ represe	tion of Binary Tree in The Basic Concepts, Elemential representation and the Basic Concepts, Elemential representation of a graph,	n memor SST opera of graph Operation	y, Traversing ations. s; Adjacency as on graph,	06
	Referen	ce Boo	k					
2	Sr. No.	Book			Author	Publis		
	OJI56	Progra	amming in ANSI C,		Balgurusamy -9	Tata 1	McGraw-Hill, Edition.	Third



Seymour

Lipschutz,

Data Structure with C, Schaum's

2.

Outlines,

1 - C. HDOVE

Tata McGraw Hill.

# Maharashtra Institute of Technology, Aurangabad. (An Autonomous Institute) B.Voc. (Artificial Intelligence and Robotics)

NSQF	Level-5 VAI153: Basics of I	Robotics	Semes	ster-II		
T	Feaching Scheme	Examin	ation Scheme	1		
Lectures	03 hrs/Week	MSE	10 Marks	ectures		
Practical	EXMIN CL AT	TA	15 Marks	ractical		
Total Cre	edits 03	ESE	25 Marks	zhbor.		
	Duration of ball   La Hours	Duration of ESI	E 1.5 hours			
	Outcomes (CO) will be able to To know the importance and b	asic theory of robotics	Outconies (C.) will be able to	arabul arabul		
		e with the different Geles	To familiariz	r		
2.	To Gain Knowledge about the		- Alta - Daylar I	ww.		
Unit		Course Content	· Ann Investor	Hours		
Unit 1	Introduction: Robot anatomy-Definition, law of robotics, History and Terminology of Robotics-Accuracy and repeatability of Robotics.					
Unit 2	Specifications of Robot: Specifications of Robot - Speed of Robot-Robot joints and links-Robot classifications-Architecture of robotic systems-Robot Drive systems- Hydraulic, Pneumatic and Electric system.					
Unit 3	mechanism, Screw type, Rotary a grippers-Air operated grippers-G		ers-Vacuum	06		
Unit 4	Point to point control, Continuo for robot joint-Control actions-Fo	ol –II: Design -Simple problems-R nus path control, Intelligent robot-C eedback devices-Encoder, Resolver	Control system	06		
Referen	ce Book	- and - and -	Datistics Da			
Sr. No.	Book	Author	Publisher			
1	Robotics Technology and flexible automation,	S.R. Deb	Tata McGr Education.			
2.	Industrial Robotics, Technology programming and Applications A,  Richard D. Klafter, Thomas McGraw Hi			iill, .		
3.	Robotics Engineering Michael Negin, Phi					



# Maharashtra Institute of Technology, Aurangabad. (An Autonomous Institute) B.Voc. (Artificial Intelligence and Robotics)

	Level-	VAI154: Dig	ital Electronic	es and a loss		Semes	ster-II
T	eaching	Scheme			Examinat	ion Scheme	aT
Lectures	-	03 hrs/Week	921/2	MSE	Seal Hope	10 Marks	ponet:
Practical	Silver Carlotte Carlo				15 Marks	Isolto	
Credits	parely	03	323	ESE		25 Marks	harO lis
	mund	P T   HEER   T S	neane'l	Durat	ion of ESE	1.5 hours	
Course (	Outcon	ies (CO)			10	The same of	rO seru
Students	will be	able to				st alda ad His	ar steelfe
1.		miliarize with the			equenchini.	To know the	
2.	To fai	miliarize with the	e different Ga	ites			9
Unit				e Content	oda sehabur	m I alsh all	Hours
Unit 1	Digitation, Digitation, Digitation, Digitation	duction to Digit al and Analog Si al Waveforms, Lo tions, Combinati , Fixed-Function	gnals and Sys ogic Systems-lional and Sequ	tems, Binary Dig Positive and neguential Logic Fun	gits, Logic L ative, Logic	evels, and	06
Unit 2	Logic, Fixed-Function Logic Devices.  Number Systems and Codes: Introduction to Number Systems-Types-Decimal, Binary, Octal, Hexadecimal; Conversion from one number system to other; Binary arithmetic operations; Representation of Negative Numbers; 1's complement and 2's complement, Complement arithmetic, BCD code, Digital Codes -Excess-3 code, Gray code, Binary to Excess -3 code conversion and vice versa, ASCII code, EBCIDIC code, Error Detection Codes.						06
	code	conversion and	des -Excess-3	3 code, Gray cod	de, Binary to	Excess -3	nt 4.
Unit 3	Logic Activ	conversion and	vice versa,  I Operators, I	ASCII code, E  Logic Gates-Bas  pts, Universal C	de, Binary to BECIDIC co sic Gates, Co Gates and rea	D Excess -3 de , Error Other gates, alization of	06
Unit 3 Unit 4	Logic Activother Param  Boold Theor forms expre.	conversion and tion Codes.  Gates: Logical e high and Activity gates using uni	odes -Excess-3 vice versa,  l Operators, I ve low conceptorsal gates,  :Rules and I expressions and Maxterms, ( Theorem, Si ques for Bool	ASCII code, E  Logic Gates-Bas pts, Universal C Gate Performan  aws of Boolean d Truth Tables, Canaonical repr mplification of ean Expressions	de, Binary to BEIDIC co sic Gates, Co Gates and rea nice Characte n algebra, I Standard SO resentation of Boolean E	o Excess -3 de , Error other gates, alization of eristics and opemorgan's opemorgan's opemorgan's opemorgan's opemorgan's opemorgan's opemorgan's opemorgan's	06
, AU	Logic Active other Param  Boold Theorems expree Minimand Q	Gates: Logical e high and Activity gates using unineters.  ean Algebra eems, Boolean Expensions, Duality mization Technical puine McCluskey	odes -Excess-3 vice versa,  l Operators, I ve low conceptorsal gates,  :Rules and I expressions and Maxterms, ( Theorem, Si ques for Bool	ASCII code, E  Logic Gates-Bas pts, Universal C Gate Performan  aws of Boolean d Truth Tables, Canaonical repr mplification of ean Expressions	de, Binary to BEIDIC co sic Gates, Co Gates and rea nice Characte n algebra, I Standard SO resentation of Boolean E	o Excess -3 de , Error other gates, alization of eristics and opemorgan's opemorgan's opemorgan's opemorgan's opemorgan's opemorgan's opemorgan's opemorgan's	
Unit 4	Logic Active other Param  Boold Theorems expree Minimand Q	Gates: Logical e high and Activity gates using unineters.  ean Algebra eems, Boolean Expensions, Duality mization Technical puine McCluskey	odes -Excess-3 vice versa,  l Operators, I ve low conceptorsal gates,  :Rules and I expressions and Maxterms, ( Theorem, Si ques for Bool	ASCII code, E  Logic Gates-Bas pts, Universal C Gate Performan  aws of Boolean d Truth Tables, Canaonical repr mplification of ean Expressions	de, Binary to BECIDIC co sic Gates, Co Gates and rea nee Characte n algebra, I Standard SO resentation of Boolean E s using Karn	o Excess -3 de , Error other gates, alization of cristics and openorgan's op and POS of Boolean expressions, naugh Map	
Unit 4	Logic Active other Param Boold Theorems expre Minimand Q	Gates: Logical e high and Active gates using unineters.  ean Algebra eems, Boolean Expensions, Duality mization Technical puine McCluskey	odes -Excess-3 vice versa,  l Operators, I ve low conceptiversal gates, :Rules and I expressions and Maxterms, ( Theorem, Si ques for Bool Tabular meth	ASCII code, E  Logic Gates-Bas pts, Universal C  Gate Performan  aws of Boolean d Truth Tables, Canaonical representation of ean Expressions and.	de, Binary to BECIDIC co sic Gates, Co Gates and rea nee Characte n algebra, I Standard SO resentation of Boolean E s using Karn	o Excess -3 de , Error other gates, alization of cristics and Demorgan's P and POS of Boolean expressions, naugh Map	



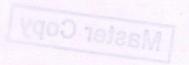
### Maharashtra Institute of Technology, Aurangabad.

(An Autonomous Institute)

B.Voc. (Artificial Intelligence and Robotics)

NSQF L	evel-5	VAI171: Laboratory of	f Programming in Python-Lab	Semester-II	
Tea	ching	Scheme	Exami	nation Scheme	
Practical		2 Hours/week	TA	25 Marks	
Credits		1.5	ESE/PE	25 Marks	
Sr.No.	ex	ESEPPE 25 Mar	List of Experiments	redita 1.5	
1	Create a list and perform the following methods 1) insert() 2) remove() 3) append( len() 5) pop() 6) clear()  Create a dictionary and apply the following methods 1) Print the dictionary items 2				
2	access items 3) use get() 4)change values 5) use len()				
3		a python program to add	A series of the figures of the series of the series of	- 3 Design and im	
4	Write a Program for checking whether the given number is an even number or not. Using a for loop.				
5			e basic data type in python.	5 Design and im	
6	Write	e a python program to prin	t a number is positive/negative	e using if-else.	





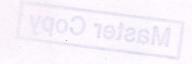


### Maharashtra Institute of Technology, Aurangabad.

(An Autonomous Institute)

B.Voc. (Artificial Intelligence and Robotics)

NSQF L	evel -5 VAI172: Digital Electro	onics Lab	Semester-II		
Tea	aching Scheme	Exan	nination Scheme		
Practical	2 Hours/week	TA	25 Marks		
Credits	1.5	ESE/PE	25 Marks		
Sr.No.	ds 1) insert() 2) remove() 3) apr	List of Experiments	n has tell a stew?)		
1	To study and verify the truth ta	able of logic.	len() 5) pop() 6) cl		
2	Realization of a Boolean func	tion.	Create a divisioner,		
3	Design and implementation using NAND gate				
4	Design and implementation using OR gate				
5	Design and implementation using AND gate				
6	Design and implementation using NOR gate				
7	Design and implementation us	sing EXOR gate			





### G. S. Mandal's Maharashtra Institute of Technology, Aurangabad. (An Autonomous Institute) B.Voc. (Artificial Intelligence and Robotics)

NSQF Lev	vel -5 On Job Train	ning/Qualification Packs*	Semester-II
	hing Scheme	Exami	nation Scheme
Practical	7-8 weeks	TA	50 Marks
Credits	15	ESE/PE	150 Marks
VAI181	Industrial Automation Specia	alist (IAS/Q8005)	
VAI182	Test Engineer( SSC/ Q7001)		703/ 1 F 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
*Any one On-	Job-Training as per guidelines of AIC	TE & SSC for the given skill sets for 1	50 Marks External Assessme

by NSDC/SSC