Course		Title							
23PGB		Elective Paper – I (C) Resea							
Semes	ter: I			SE: 75 Marks					
Course O	bjective	To develop a research orientation among the students research methods. Specifically, introducing them to t scientific social research methods and their approach							
Course C	ategory	Skill development and Employability							
Developme	ent Needs	Global							
Course De	scription	Basic concepts and methods of quantitative empirical learn more about the research. At the end of the cours applied research methodology.		pped with basic and					
		Course Outcomes	Teaching Methods	Assessment Methods					
CO1		mework of research process	Video lessons	Assignment					
CO2	Various 1	research designs and technique	Review Article	Assignment					
CO3	Various	sources of information for literature review and data	based lessons Research articles	Seminar					
CUS	collection		based lessons	Sellillai					
CO4	Ethical d	imensions of conducting applied research Appreciate	Lectures / Hands -	Writing skill test					
	the comp	onents of scholarly writing and evaluate its quality	on training	-					
CO5	Procedur	e for writing research proposal and grant	Lectures / Online	Online Searching					
			based teaching	Test					
Course Off	ered by	Biotechnology							
Course Co	ntent	Instruction Hou	rs /Week : 4						
Unit		Description	Text Book	Chapter					
I	research. for good r Defining	e and Steps in Research process : Definition, objecti Types and its significance. Steps in research process. C research. and formulating a research problem. Literature s nent of working hypothesis.	riteria 1	1, 2					
			Instructional Hours	12					
Suggested L	earning M	ethods: Presentation and Video lectures of basic res	earch process.						
П	experiment Sampling and Proba	Lesearch design: Definition and related concepts, Basic principles of xperimental designs- Informal and formal experimental designs ampling design: Steps in sample design, Non-probability sampling 1 nd Probability sampling -random sampling; Measurement and scaling echniques- Methods of data collection.							
			Instructional Hours	12					
Suggested I methods.	Learning	Methods: Practice in field study, sample collect	ion and preservation						
III	Questionr Procedure Experime Control	of Data: Primary Data, Secondary Data; Proc naire: Sampling Merits and Demerits - Experiments - K ; Procedure Schedules: Sampling Merits and Demo nts - Kinds - Procedure; Observation: Merits - Demerits - Kinds - Proced Errors: Type-I Error, Type-II Error	inds - erits - 1	6, 9					
			Instructional Hours	12					
		Methods: Data processing techniques by statis s through computer software.	tical tools and data						

IV	Re of	eport, final	Typ drafi	es of t, eva	vriting: ste Reports, S luating the he final dr	Styles o final d	f report	ing. Edi	ting and	evaluatio	n 1.	& 2	14, 1	0, 20
										In	structiona	l Hours	1	2
Suggested writing.	Lear	ning	Me	thods	: Hand-o	n train	ing on	writing	skills s	uch as, 1	report and	l article		
V	ma in all	aster's open ocatio	s the defe on, s	sis fo nce. I pecifi	sal/Grant or oral pres Research p ic aims, b in India an	sentatio roposal ackgrou	n; Prese /Grant- ind and	enting th definitio signific	e researd	ch finding ure, budg	gs et 2	2	20	
										Inst	tructional	Hours	1	2
Suggested proposals.		rning	Mo	ethod	s: Aware	ness o	n fund	ing age	encies a	nd train	ing to w	rite the		
											Total	l Hours	6	0
Text Bo	Text Books 1. Kothari, C.R., Research Methodology: Methods and Techniques, New Age International Publishers, 2 nd Edition, 2010. 2. Chawla Deepak &SondhiNeena., Research Methodology: Concepts and Cases, House Pvt. Ltd. Delhi, 2011 1. Gurumani, N., Research Methodology for Biological Science, MJP Publishers, 2												, Vikas Pu , Chennai,	blishing
Referen Web. Ul		DOKS	3. C 1. <u>h</u>	. R. K	Cothari, Re	search l	Methodo	ology: M n/doi/b	lethods a	nd Techn	for Beginn iques, New <u>81118763(</u>	Age Int		010.
						Tools	for As	signm	ent (25	Marks)			
CIA	[С	IA I	Ι	CIA III	Se	minar		Viva voce Case study				Total	
5			5		6		3		3		3		25	
						-		Mappi	-					
CO\PO CO1	PO1 L		02 L	<u>РОЗ</u> Н	3 PO4 M	PO5 L	PO6 M	РО7 М	PO8	PSO1 H	PSO2 L	PSO3 L	PSO4 M	PSO5 H
CO1 CO2	M			L	M	M	L	L	L	Н	M	M	M	н Н
CO3	L		Ĺ	M	M	L	L	L	M	L	M	M	M	L
CO4	L		L	Μ	М	L	L	М	Н	L	L	М	М	Н
CO5	Μ	Ν	M	L	L	L	M	M	M	Н	М	Н	М	L
H-High;	; M-N	lediu	m; I	L-Lov	W									
		C	Coui	rse d	lesigned	by				Ve	rified by	Chair	man	
		Dr. 1	Р. Т	Thiru	ınavukk	arasu				I	Dr. N. Sa	ranya		

Course	e Code			Title			
23U3F	SE604		Discipline Specific Elective	-II (A) - <mark>Fundament</mark> a	als of Resea	rch	
Semest	ter: VI		Credits: 4 CIA	ESE : 75 N	Aarks		
Course	Objectiv	e	 Understand the research termi Identify the components of 				
	Category	,	Skill development				
Develop Needs	oment		Global				
Course	Descripti	on	It helps to acquire knowledge abo	out research developme	nt in food se	ctor	
Course	Outcome			Teaching Methods	Assessm	ent Methods	
CO 1	process.		he basic knowledge of research	Lecture-based instruction	S	eminar	
CO 2	and dom scientific	estic inte	al dilemmas faced by international researchers and the importance of grity in research.	Activity based Teaching		up activity	
CO 3	Apply Q	uanti	tative and Qualitative Research	Survey techniques	S	eminar	
CO 4	Examine	the f	fundamental of sampling method	E-modules	As	signment	
CO 5			est practices of study design and elopment	Experiment based teaching]	Project	
Offered	by		Food Science and Nutrition				
Course	Content			Instruc	ctional Hou	rs / Week:4	
Unit			Description		Text Book	Chapters	
Ι	Introduc Basic ch Ethics a	tion arac nd Iı and	of Research: to Research- Empiricism, deductive teristics of scientific method- Rese ntegrity- Critical appraisal. Finding fees-Predatory publishing-Manuscr	arch Process- Research the right journal-Open	1	3	
				Instructio	nal Hours	12	
Suggest	ed Learn	ing	Methods: Group activity, Resea	rch poster			
П	Research Statistica Size, No	n Que al Po n Re	concepts of identification & formulat estion – Hypothesis. Fundamentals of pulation, Sample, Sampling Frame, sponse. Probability Sample – Simple ematic Sample, Stratified Random Sa	of Sampling: Concepts o Sampling Error, Sample e Random ample	f 1,2	2	
~		nal Hours	12				
Suggest			Methods: Group discussion, Pee	er learning			
ш	Introduc Analysis Quantita Qualita Introduc and Inte	tion and tive 1 tive 1 tion	e Research : to Quantitative Research, Study I Interpretation of Quantitative Dat Research. Research: to Qualitative Research, Study Design tation of Qualitative Data-Critical A	a- Critical Appraisal o ns and Methods-Analysis	f 1,2	2 & 5	
	Research	1.		Instructio	nal Hours	12	

IV	tabl Star Mix	ic data a es, bar ndard dev ed Meth rpretatio	2		6									
		hods Rea												
G		•			•						tructio	nal Hou	irs	12
Sugges		arning			-									
V	Patent-definition, requirements, patent laws India, administrator, need for patent system, advantages, patent procedures Related practical34VData analysis and presentation using Ms.Excel, SPSS and RSM Conducting Research Responsibly: Ethical issues related to publishing - IRB-Human subjects-Plagiarism34													4
										Ins	tructio	nal Hou	irs	12
Sugges	ted Le	arning	Metho	ls: Ex	perim	ental l	learnin	ıg, Re	esea	rch pr			• •	
											To	tal Hou	irs	60
Text Books1. Creswell, J. W. Research design: Q approaches. 5th Ed. Thousand Oaks 2. Kothari, C.R. Research Methodo International Publications, 4thEd 3. Turabian, K.L. 2007. A Manual f Dissertations. University of Chicag										Sage, Metho 2018 iters of ss. 7th e	2018. ods and f Resear ed	Techni rch Pape	ques, Ne	ew age es, and
Referen		oks	Pro 2. Do Wa	obabili nald, l adswo	ity and H.Mc. rth Put	Statis Burne olicatio	tics, Cł	nanila earch 02	tha I Met	Public thods, 1	ations, Fifth Eo	Second	al Metl Edition, Thomson	2000.
JUIIIa	15		2. Th							-	e resea	rch.		
					ools fo	r Asse	essmen	t (25	Mai	rks)				
C	IAI	CIA	II		СІА Ш	[5	Seminar		Cas stuc			Mini Project	7	Fotal
5		4	5		6		3			3		3		25
						Μ	apping	5						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	POS	3 1	PSO	PSO	PSO	PSO	PSO
\PO CO1	M		M			M		M		1 M	2 M	3 L	4 H	5 H
CO1	M		171	Н	М					M	L	L	H	M
CO3	М	М		Н	М	М	М			L	М	М	М	Н
CO4	L	Н	М	М			Н	Μ		L	Н	Н	Н	Н
CO5	Μ	М			М	М				М	L	L	Н	L
H-High	n; M-N	Iedium	; L-Lov	V										
		Cour	se desi	gned l	ру					Ver	rified b	y Chair	man	
			. Thilag	~	•			Verified by Chairman Dr. A. Swarnalatha						

	.Sc., Food		NAS		2023				
Cours	se Code	Tit	tle						
3PGF	NC310	Paper X – Research M							
	ester: III	Credits:4 CIA:	25 Marks	ESE:	75 Marks				
Course	Objective	1. Understand the principles and meth		d dearra	nfaranaaa				
Course	Category	2. Apply statistical procedure analy Skill development	yze numerical data and	I UI aw	interences.				
	pment Needs	Global							
	Description	It helps to acquire knowledge about re	search development in	food se	ctor				
	1	Course Outcomes							
		Teaching Method	C	ssessment Methods					
	-	ween research objectives and sampling	Lecture-based instruct	ion	Seminar				
	nethods dentify differ	ent data collection methods	Survey Techniques		Case studies				
-		cools and techniques to analyze and	Survey Techniques		Seminar				
	bresent data		· · · · ·						
		ate the research designs and apply	Activity based		Assignment				
	ppropriate sta	Teaching		-					
CO5	Analyse data s	tatistically using ICT tools	Experiment based teac	ching	Project				
Offered	by Departm	ent of Food Science and Nutrition							
Course	Content		Instructiona		Week:5				
Unit		Description		Text Book	Chapters				
	Research ty	pes and sampling methods:							
-		research, objectives of research, types							
Ι		selection and formulation of research I		1	3				
		research—different types, census a asis of sampling, sampling methods							
	non sampling	non-random sampling methods, sizeof							
		non-random sampling methods, sizeof s g errors.	sample, sampling and Instructional						
	non sampling	non-random sampling methods, sizeof a g errors. Suggested Learning Methods: O	sample, sampling and Instructional		15				
	non sampling Methods of	non-random sampling methods, sizeof g errors. Suggested Learning Methods: C Collecting Data:	sample, sampling and Instructional Group activity, Researc		15				
	non sampling Methods of Questionnair	non-random sampling methods, sizeof gerrors. Suggested Learning Methods: C Collecting Data: e, preparation of schedules, interview	sample, sampling and Instructional Group activity, Researc Wethod, case study		15				
	non sampling Methods of Questionnair method, exp	non-random sampling methods, sizeof gerrors. Suggested Learning Methods: C Collecting Data: e, preparation of schedules, interview erimentation method, sources of secon	sample, sampling and Instructional Group activity, Researc w method, case study dary data, precautions	h poster	15				
II	non sampling Methods of Questionnair method, exp while using s	non-random sampling methods, sizeof gerrors. Suggested Learning Methods: C Collecting Data: e, preparation of schedules, interview erimentation method, sources of secon econdary data. Editing and Coding the	sample, sampling and Instructional Group activity, Researc wethod, case study dary data, precautions Data Organization of		15				
II	non sampling Methods of Questionnair method, exp while using s Data – Class	non-random sampling methods, sizeof gerrors. Suggested Learning Methods: C Collecting Data: e, preparation of schedules, interview erimentation method, sources of secon	sample, sampling and Instructional Group activity, Researce method, case study dary data, precautions Data Organization of ypes of classification,	h poster	15				
II	Methods of Questionnair method, exp while using s Data – Clas formation of	non-random sampling methods, sizeof gerrors. Suggested Learning Methods: C Collecting Data: e, preparation of schedules, interview erimentation method, sources of secon econdary data. Editing and Coding the sification – meaning and objectives, t	sample, sampling and Instructional Group activity, Researce w method, case study dary data, precautions Data Organization of ypes of classification, stribution, tabulation – of tables	h poster 1,2	15				
II	Methods of Questionnair method, exp while using s Data – Clas formation of	non-random sampling methods, sizeof gerrors. Suggested Learning Methods: C Collecting Data: e, preparation of schedules, interview erimentation method, sources of secon econdary data. Editing and Coding the sification – meaning and objectives, t discrete and continuous frequency dis a table, general rules of tabulation, types	sample, sampling and Instructional Group activity, Researce wethod, case study dary data, precautions Data Organization of ypes of classification, stribution, tabulation – of tables Instructional	h poster 1,2 Hours					
	non sampling Methods of Questionnair method, exp while using s Data – Clas formation of role, part of a	non-random sampling methods, sizeof g errors. Suggested Learning Methods: C Collecting Data: e, preparation of schedules, interview erimentation method, sources of secon econdary data. Editing and Coding the stification – meaning and objectives, t discrete and continuous frequency dis a table, general rules of tabulation, types Suggested Learning Methods:	sample, sampling and Instructional Group activity, Researce we method, case study dary data, precautions Data Organization of ypes of classification, stribution, tabulation – of tables Instructional Group discussion, Peer	h poster 1,2 Hours	15				
II	non sampling Methods of Questionnair method, exp while using s Data – Class formation of role, part of a	non-random sampling methods, sizeof gerrors. Suggested Learning Methods: C Collecting Data: e, preparation of schedules, interview erimentation method, sources of secon econdary data. Editing and Coding the ssification – meaning and objectives, t discrete and continuous frequency dis a table, general rules of tabulation, types Suggested Learning Methods: C tion of Data: Diagrammatic and graphica	sample, sampling and Instructional Group activity, Researce we method, case study dary data, precautions Data Organization of ypes of classification, stribution, tabulation – of tables Instructional Group discussion, Peer 1 al representation –	h poster 1,2 Hours learning	15				
	non sampling Methods of Questionnair method, exp while using s Data – Class formation of role, part of a Representat significance	non-random sampling methods, sizeof gerrors. Suggested Learning Methods: C Collecting Data: e, preparation of schedules, interview erimentation method, sources of secon econdary data. Editing and Coding the sification – meaning and objectives, t discrete and continuous frequency dis a table, general rules of tabulation, types Suggested Learning Methods: C tion of Data:Diagrammatic and graphica of diagrams and graphs – general rules of	sample, sampling and Instructional Group activity, Researce we method, case study dary data, precautions Data Organization of ypes of classification, stribution, tabulation – of tables Instructional Group discussion, Peer I al representation – for constructing	h poster 1,2 Hours					
	non sampling Methods of Questionnair method, exp while using s Data – Class formation of role, part of a Representat significance diagrams – t distribution.	non-random sampling methods, sizeof gerrors. Suggested Learning Methods: C Collecting Data: e, preparation of schedules, interview erimentation method, sources of secon econdary data. Editing and Coding the ssification – meaning and objectives, t discrete and continuous frequency dis a table, general rules of tabulation, types Suggested Learning Methods: C tion of Data: Diagrammatic and graphica	sample, sampling and Instructional Group activity, Researce we method, case study dary data, precautions Data Organization of ypes of classification, attribution, tabulation – of tables Instructional Group discussion, Peer al representation – for constructing graphs of frequency Meaning of	h poster 1,2 Hours learning	15				

Suggested Learning Methods: Experimental learning, case studies IV Measures of Central Tendency: Mean, median, mode, the irrelative advantages and disadvantages. Measures of dispersion — mean deviation, standard deviation, quartile deviation. Co-efficient of variation, percentile and percentile ranks. Association of attributes, contingency tables, correlation, coefficient of correlation and its interpretation, rank correlation, regression equations and predictions. Instructional Hours Suggested Learning Methods: Assignment, Model preparation Instructional Hours 1 V Probability – Rules of probability and its applications. Distribution – normal, binomial, their properties, importance of these distributions in statistical studies. Tests of significance – large and small samples, t, chi-square test. Analysis of variance – one-way and two-way classification Related practical Data analysis and presentation using Ms.Excel. SPSS and RSM 1. Suggested Learning Methods: Experiential learning and research proposal 1 Text Books 1. Kothari, C.R.Research Methodology: Methods and Techniques, New International Publications, 4 th Edition, 2018. 2. Gupta, S.F., Statistical Methods, Sultana Chand and Sons, 31Revises Edition Ramakrishnan, P., Biostatistics, SaraPublication, 2000. 2. Donald, H.Mc.Burney, Research Methods, Fifth Edition, Thomson and Wads Publications, 2002. Journals 1. Journal of fundamentals and comparative research. 3. 3 3 3 25											Instruct	ional Ho	urs	
IV Measures of Central Tendency: Mean, median, mode, the irrelative advantages and disadvantages. Measures of dispersion — mean deviation, standard deviation, quartile deviation. Co-efficient of variation, percentile and percentile ranks. Association of attributes, contingency tables, correlation, coefficient of correlation and its interpretation, rank correlation, regression equations and predictions. 2 Instructional Hours Suggested Learning Methods: Assignment, Model preparation Instructional Hours Suggested Learning Methods: Assignment, Model preparation Instructional Hours Suggested Learning Methods: Assignment, Model preparation V Probability – Rules of probability and its applications. Distribution – normal, binomial, their properties, importance of these distributions in statistical studies. Tests of significance– large and small samples, t, chi-square test. Analysis of variance – one-way and two-way classification Related practical Data analysis and presentation using Ms Excel, SPSS and RSM Instructional Hours 15 Suggested Learning Methods: Experiential learning and research proposal Text Books 1. Kothari, C.R.Research Methodology: Methods and Techniques, New International Publications, 2001. Reference Books 1. Journal of	Su	ggested	l Learn	ing Me	ethods:	Experi	mental	learning	, case s					1
Instructional Hours Suggested Learning Methods: Assignment, Model preparation V Probability – Rules of probability and its applications. Distribution – normal, binomial, their properties, importance of these distributions in statistical studies. Tests of significance – large and small samples, t, chi- square test. Analysis of variance – one-way and two-way classification 1,3 6 Related practical Data analysis and presentation using Ms.Excel, SPSS and RSM Instructional Hours 15 Suggested Learning Methods: Experiential learning and research proposal Text Books 1. Kothari, C.R.Research Methodology: Methods and Techniques, New International Publications, 4 th Edition, 2018. Coupta, S.F., Statistical Methods, Sultana Chand and Sons, 3IRevises Edition Ramakrishnan, P., Biostatistics, SaraPublication, 2001. 1. Shanthi Sophia Bharathi, Computer Oriented Statistical Methods/ Probabili Statistics, Chanilatha Publications, Second Edition, 2000. 2. Donald, H.Mc.Burney, Research Methods, Fifth Edition, Thomson and Wads Publications,2002 Journals 1. Journal of research statistics in social science Mini project Total Project S 6 3 3 3 25 Cons for Assessment (25 Marks) Mini project Total project Mini Project Total p		M ad sta an cc	leasures lvantage andard o nd percorrelatio	of Contract of Con	entral ' lisadva on, qua ranks. efficient	Tenden ntages. rtile dev Assoc t of o	cy: Me Measur viation. iation correlat	ean, me res of dis Co-effic of attril ion and	dian, n spersion cient of butes, l its i	node, th n — mea variation continge	n deviati n, percen ency tab	lon, tile les,	2	6
V Probability – Rules of probability and its applications. Distribution – normal, binomial, their properties, importance of these distributions in statistical studies. Tests of significance– large and small samples, t, chi- square test. Analysis of variance– one-way and two-way classification Related practical Data analysis and presentation using Ms.Excel. SPSS and RSM 1,3 6 Instructional Hours 15 Suggested Learning Methods: Experiential learning and research proposal Text Books 1 Kothari,C.R.Research Methodology: Methods and Techniques, New International Publications,4 th Edition,2018. 2. Gupta,S.F.,Statistical Methods, Sultana Chand and Sons,3IRevises Edition Ramakrishnan,P.Biostatistics,SaraPublication,2001. Reference Books 1. Shanthi Sophia Bharathi, Computer Oriented Statistical Methods/ Probabili Statistics, Chanilatha Publications, Second Edition, 2000. 2. Donald,H.Mc.Burney, Research Methods, Fifth Edition, Thomson and Wads Publications,2002 Journals 1. Journal of research statistics in social science 2. The journal of social science research Tools for Assessment (25 Marks) CO/P O Mapping Coolspan="2">Mapping Coolspan="2">Mapping Coolspan= 2 Poi				, .0		1					Instruc	tional H	ours	1
normal, binomial, their properties, importance of these distributions in statistical studies. Tests of significance– large and small samples, t, chi-square test. Analysis of variance– one-way and two-way classification Related practical Data analysis and presentation using Ms Excel. SPSS and RSM Instructional Hours 15 Suggested Learning Methods: Experiential learning and research proposal Text Books 1. Kothari,C.R.Research Methodology: Methods and Techniques, New International Publications,4 th Edition,2018. 2. Gupta,S.F.,Statistical Methods, Sultana Chand and Sons,3IRevises Edition Ramakrishnan,P.,Biostatistics,SaraPublication,2001. Reference 1. Shanthi Sophia Bharathi, Computer Oriented Statistical Methods/ Probabili Statistics, Chanilatha Publications, Second Edition, 2000. 2. Donald,H.Mc.Burney, Research Methods, Fifth Edition, Thomson and Wads Publications,2002 Journals 1. Journal of research statistics in social science 2. The journal of fundamentals and comparative research. 3. The Journal of social science research Mapping CO/P PO1 PO2 O PO3 PO4 PO5 PO6 PO7 PO8 PS01 PS02 PS03 PS04 P CO/P PO1 PO2 PO3 PO4 PO5 PO6	Sugge	ested Lo	earning	g Metho	ods: As	signme	ent, Mo	del prepa	aration					
Instructional Hours 15 Suggested Learning Methods: Experiential learning and research proposal Text Books 1. Kothari, C.R.Research Methodology: Methods and Techniques, New International Publications, 4 th Edition, 2018. 2. Gupta, S.F., Statistical Methods, Sultana Chand and Sons, 3lRevises Edition Ramakrishnan, P., Biostatistics, SaraPublication, 2001. Reference Books 1. Shanthi Sophia Bharathi, Computer Oriented Statistical Methods/ Probabili Statistics, Chanilatha Publications, Second Edition, 2000. 2. Donald, H.Mc. Burney, Research Methods, Fifth Edition, Thomson and Wads Publications, 2002. Journals 1. Journal of research statistics in social science 2. The journal of fundamentals and comparative research. 3. The Journal of social science research Mapping CO/P PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PS01 PS02 PS03 PS04 PS O M L L H H H L L L CO/P PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PS01 PS03 PS04 PS	V	norr stati squa <mark>Rela</mark>	nal, bin istical st are test. ated pra	omial, udies. ' Analys	their pr Tests of sis of va	opertie f signifi ariance-	s, impo icance– – one-w	rtance of large ar vay and t	f these nd smal wo-wa	distribut 1 sample y classifi	ions in s, t, chi- ication		,3	68
Text Books 1. Kothari, C.R.Research Methodology: Methods and Techniques, New International Publications, 4 th Edition, 2018. 2. Gupta, S.F., Statistical Methods, Sultana Chand and Sons, 31Revises Edition Ramakrishnan, P., Biostatistics, SaraPublication, 2001. Reference Books 1. Shanthi Sophia Bharathi, Computer Oriented Statistical Methods/ Probabili Statistics, Chanilatha Publications, Second Edition, 2000. 2. Donald, H.Mc. Burney, Research Methods, Fifth Edition, Thomson and Wads Publications, 2002 Journals 1. Journal of research statistics in social science 2. The journal of fundamentals and comparative research. 3. The Journal of social science research CIA I CIA II CIA III Seminar Performance in practical Mini Project Total CO/P PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PS01 PS02 PS03 PS04 PS CO/P PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PS01 PS02 PS03 PS04 PS CO/P PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PS01 PS02 PS03 PS04 PS CO3 H<	<u> </u>										Instruc	tional H	ours15	
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Tools for Assessment (25 Marks)CIA ICIA IICIA IIISeminarPerformance in practicalMini ProjectTotal5563325MappingCO/P OPO1 IPO2 IPO3 IPO4 IPO5 IPO6 IPO7 IPO8 IPS01 IPS02 IPS03 IPS04 IPS04 PS04 CO/P OPO1 IILLLILLICO1LLLLMHLLIII <td< th=""><th></th><th></th><th></th><th>Ran . Sh</br></th><th>nakrishi anthi S</br></th><th>nan,P.,H ophia H</th><th>Biostati: Bharath</th><th>thods, S stics,Sar i, Comp</th><th>Sultana aPublic uter Or</th><th>Chand cation,20 riented S</th><th>01. tatistical</th><th>Methods</th><th></th><th></th></td<>				Ran 	nakrishi 	nan,P.,H ophia H	Biostati: Bharath	thods, S stics,Sar i, Comp	Sultana aPublic uter Or	Chand cation,20 riented S	01. tatistical	Methods		
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Cours	se Code	Title									
23PGN	MBC311	Paper – XI : Biostatistics and I	Research Methoo	dology							
Semes	ster : III	Credits : 4 CIA : 2	5 Marks	ESE:	75 Marks						
Course	Objective	This course give knowledge about designing the applications in Research	research project	and vario	us statistical						
Course	Category	Skill Development									
Develop Needs	ment	Global									
Course Descript	tion	It provides a overview of Statistical methods for a longitudinal measures take over time		-	-						
		Course Outcomes	Teaching Methods		Assessment Methods						
CO 1	memorizi	g the method of data collection, presentation and ng different Measures of Central Tendency and of Dispersion	Group learnin Lectures.	ng/	Seminar						
CO 2	Identify the fficient.	Peer Teachin Lectures	g/	Unit Test							
CO 3	Sampling	shing different Statistical situations using Techniques	Lectures/ Tuto		Seminar						
CO 4		one way and two way analysis using analysis of and Experimental Design.	Video Lecture Lectures	es / A	Assignment						
CO 5	Critically	evaluate the Research Designs.	Group learnin Lectures	g /	Quiz						
Offered	by Mat	hematics									
Course	Content		Instructional	Hours / V	Week:5						
Unit		Description		Text Book	Chapters						
Ŧ		oncepts of Biostatistics : Scope of Biostatistics tion and Tabulation of Data. Diagrammatic ation		1	1,3,5,6						
Ι	Measures Measure of	of Central Tendency : Arithmetic mean, Most Dispersion: Range, Quartile Deviation, Standard nt of Variation.		1	7 – 8						
			Instructiona	al Hours	15						
Suggest		g Methods: Seminar									
Ш	Correlation: Definition – Scatter diagram – Karl Pearson's correlation co – efficient – Properties - Rank correlation co – efficient –Properties. Regression: Introduction – Construction of regression equations – Properties of regression.1										
		~~~~~	Instructiona	al Hours	15						
	ed Learnin		~ 1								
Suggeste	ted Learning Methods: Problem Solving Practise         Sampling Techniques: Introduction – Methods of Sampling- Sampling and Non-Sampling errors.       3       2										
	Non-Sam	pling errors.		3	2						
Suggeste	Non-Sam Testing of between t		ple –Difference	3 1	2 Vol II:3,4						

Suggest	ed Le	arning	Metho	ls: Gro	oup Lea	arning n	nethod						
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IV	Prin	ciples		npletel	y Ranc	ction – lomized		-		andomize	d 3		10
		1		0	/				]	Instructio	nal Hours	5	15
Suggest	ed Lea	arning	Metho	ls: htt	ps://you	tu.be/0	NwA9x	xxtHw					
V	Res		Process							Research Problem		1	-3
									]	Instructio	nal Hours	5	15
Suggest	ed Lea	arning	Metho	ds: Pro	blem S	olving H	Practice	1					
										Т	otal Hours	5	75
Text Books Referen Books Web. URLs	<b>ce</b> 1/2	Unit Unit Unit 2. Koth Pubi U 3. Irfan Revi U 4. Soka 2. Dr. H 2006	II: Charles Ch	apter 10 olume 1 esearcl New De – Chap – Chap an and ion, 200 Chapte : Chapto ind Rohora and	0,11; Pa II – Cha h Meth elhi. 200 pter 12 - ter – 1- Atiya K $2^{-}$ Pag er 2- Pag er 10 – p lf, F.J. A Dr. P.K	nge No $-$ ppter 3,4 nodolog )4. - Page n 3 - Page Khanum, e No - 1 hage no $-$ An Introd . Malhan	- 390-39 ; Page N y: Met to - 256 e no - 2 Fundan -16 -393 - 39 fuction to St 051 sigma-a	7,398-4 lo- 925 hods a - 275 - 7,10 nentals 96, 402 to Biost atistics,	401,414-4 -931,934 and Tecl - 20, 24 of Biosta - 420 atistics. V Himalaya	423, 451-4 ,935, 953- hniques. – 26, 31 - titistics, Uk	1004 New Age	Intern eations, npany.1	Second 987. Edition,
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						Ν	lapping	ç.					
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CO1	Н	Н	L	M	M	М	L	H	Н	Н	L	L	H
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CO3	H	L H	H H	L M	н М	н М	M	н М	н L	н М	H M	<u>н</u> L	H H
C04	H	H	M	L	H	H	L	H	H	M	L	H	H
H-High;	M-M	edium;	L-Low							· ·			
		(	Course	design	ed by					Verified	by Chairn	nan	
		N	Ís. M. I	Dhanala	akshmi				]	Dr. T. Cha	ndra Push	pam	