**ANNEXURE - II** 



# PG DEPARTMENT OF COMPUTATIONAL STUDIES

R24\_B.Sc. Data Science and Analytics

	II SEMESTER											
Codo No	Title of Course	Ρ	erioc	ls	Course	Crodite	м	ax. Marks	6			
Code No.			Т	Ρ	Category	Cleans	CAM	ESM	Total			
	Problem Solving &											
A24CPT203C	Programming	4	0	0	MJD	4	25	75	100			
	Fundamentals											
A24DAT201D	Exploratory Data Analysis	4	0	0	MJD	4	25	75	100			
A24DAD202D	Foundations of Data Science - II	4	0	0	MID	4	25	75	100			
A24ENM202C	Professional Communication in English	3	0	0	MLD	3	25	75	100			
A24TAT202C/ A24FRT202C	Tamil II / French II	2	0	0	AEC	2	25	75	100			
A24DAS201D	Exploratory Data Analysis Lab	0	0	6	SEC	3	50	50	100			
A24VAC202C	Environmental Studies	2	0	0	VAC	2	25	75	100			
A24DAC202D	C Programming	0	0	4	EEC	0	100	0	100			
						22	300	500	800			

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Department	Compu	tational Studies	Programme: B.Sc Data Science and Analytics							
Semester	SECON	ID	Cour MJD	se Cate	egory Co	ode: *E <b>1</b>	ind Sem <b>E</b>	ester Exa	m Type:	
Course Code	A24CP	T203C	P	eriods /	Week	Cred it	Ma	ximum M	arks	
			L	Т	Р	С	CA M	ESE	ТМ	
Course Name	Probler Fundar	n Solving & Programming nentals	4	0	0	4	25	75	100	
Prerequisite	Probler	n Solving Skills								
	After the	e completion of this course, th	e stude	nts will	be able	to:		BT Mapping (Highest Level)		
Course CO1 Analyze problems and develop top-down designs									2	
Outcome			K	3						
CO3 Implement logic with conditionals and loops									3	
			K	4						
	Design and implement funct	sion.			K	4				
UNIT-I Introduction to Computer Problem-Solving Periods										
Problem-solving A Verification – Effici	CO1									
UNIT-II										
Basic Data types ( Run – Debugging	Numerica	I, String) – Variables – Expres	sions –	I/O sta	tements	– Compil	e and	CO2		
UNIT-III	Decisi	ion Making – Branching & Lo	ooping			Period	s: 12			
Decision making -	Relation	al Operators – Conditional sta	atemen	t, Loopi	ing State	ements –	Nested			
loops – Infinite loop	os – Swite	ch Statements						CC	<b>D</b> 3	
UNIT-IV	Array	Techniques				Period	s: 12			
Array Manipulation Multidimensional A	– Differe Irray – Ch	nt operations – One dimensio naracter – Arrays and Strings	nal Arra	ay – Tw	o-dimen	sional Arra	ay —	CC	D4	
UNIT-V	Modul	ar solutions				Period	s: 12			
Introduction to Fu	nctions –	Importance of Design of Fu	unctions	s – Arg	uments	– Param	eters –	~~	∩ <i>⊑</i>	
Return Values – Lo	ocal and (	Global Scope – Recursion							<b>J</b> 9	
Lecture Periods:	60	Tutorial Periods: -	Prac	tical Pe	eriods: ·	•	T	otal Peric	ods: 60	
Text Books										
1. R. G. Dromey, "	How to So	olve it by Computer", Pearson	Educat	ion Indi	a, Thirte	en Editior	i, 2013.			
2. Allen B. Downey	, "Think F	Python: How to Think like a Co	omputer	Scient	ist", Thir	d Edition,	O'Reilly	Publisher	S,	
2020.										
1 Poomo Thoreio	"Dython	Programming: Lising Problem	Solvin		ach"	vford Lloiv	oreity Dr	000 2010	)	
2 Karthikevan F	, ryuion "A Textho	ook on C: Fundamentals Data	Structi	y Appic ires and	d Proble	m Solving	EISILY PI	earning 🤇	, 2008	
Web References			Junio			in colving	, , , , , , , , ,	carring, 2		
1. https://status.ne	t/articles/p	problem-solving-skills-example	es-step	s-proce	sses-tec	hniques/				
2. https://www.nptel/problem-solving-methodologies/										

TE – Theory Exam, LE – Lab Exam

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COs			Program Outo	comes (POs)			Program Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3			
1	3	2	3	3	2	2	2	2	3			
2	3	2	2	3	3	3	2	2	2			
3	2	2	2	2	3	3	3	2	2			
4	3	3	2	2	2	2	2	2	3			
5	2	3	2	2	3	3	3	3	3			

Correlation Level: 1 - Low, 2 - Medium, 3 – High Evaluation Method

Assessment		Contin	uous Ass	sessment Marks	s (CAM)	End Somostor	Total
	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	1	0	5	5	5	75	100

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Department	Comput	ational Studies	Progra	mme: <b>B.</b>	Sc Data	Data Science and Analytics							
Semester	SECON	D	Course MJD	Categor	y Code:	*Enc TE	d Semeste	er Exam	Type:				
Course Code	A24DAT	201D	Peri	ods / We	ek	Cred it	Ma	aximum	Marks				
			L	Т	Р	С	CAM	ESE	ТМ				
Course Name	Explorat	ory Data Analysis	4	4 0 0 4 25									
Prerequisite	Python	Programming											
Course	After con	npletion of the course, the students	s will be able	to				BT Mapping (Highest Level)					
Outcome	CO1	Perform data loading, transforma data	ation, and p	reliminary	y analys	is for re	al-world	K	K3				
	CO2	Create charts and graphs to effe data during Exploratory Data Ana	ctively comn Iysis	nunicate	and inte	rpret pat	terns in	K	3				
	CO3	CO3 Apply advanced statistical measures to describe and interpret datasets, including measures of central tendency and dispersion											
	CO4	CO4 Critically evaluate and draw meaningful conclusions from the analysis results											
	CO5	CO5 Demonstrate proficiency in handling time series datasets and performing Time Series Analysis (TSA) using Python.											
UNIT-I	INTROI	DUCTION				Periods	: 12						
Understanding Data Science – Significance of EDA – Making sense of Data – Comparing EDA with classical and													
Bayesian analy	vsis – softv	vare tools.							CO1				
UNIT-II	VISUAL	AIDS FOR EDA				Periods	: 12						
Line – Bar cha Personal: Ema	arts – Sca ail Technio	atter Plot – Area Plot – Pie – Ta cal requirements –Loading – Tr	ble – Polar ansformatior	chart – ∣ n -Data	Histogra Analvsis	m – Lol s Data	lipop ED/ Transforr	A with nation	CO2				
Managing Data	ıbase – Te	chniques – Benefits			,								
UNIT-III	DESCR	IPTIVE STATISTICS				Periods	: 12						
Understanding correlation – Ty	statistics - /pes of ana	- Measures of central tendency – N alysis – Multivariate analysis using	Aeasures of Titanic datas	dispersio set.	n. Corre	lation Ur	nderstandi	ng	CO3				
UNIT-IV	GROUPI	NG DATASETS				Periods	: 12	L.					
Understanding series Analysis	groupby() Understai	– Groupby mechanics – Data aggi nding Time series dataset – TSA w	regation – Pi ith Open Pov	vot tables wer Syste	s – Cros em Data.	s-tabulat	tions. Tim	e	CO4				
UNIT-V	MODEL	DEVELOPMENT AND EVALUAT	ION			Periods	: 12						
Hypothesis Tes	ting and F	egression, Model Development an	d Evaluation	ı, EDA oı	n Wine C	Quality D	ata Analy	sis	CO5				
Lecture Periods: 60 Tutorial Periods: Practical Periods: - Total Per									60				
Text Books													
1. Daniel	1. Daniel Garfield, Exploratory Data Analysis: Uncovering Insights from Your Data", 2023, Kindle Edition												
1 Suroch Kum	OKS	Lismon Abmod "Hands On Evol	oratory Data	Apolycic	with Du	thon" 20			ching				
2. John W. Tuk 3. Jake Vander	ey, "Explo Plas, "Pyt	ratory Data Analysis" , 1977 hon Data Science Handbook: Esse	ential Tools fo	or Workin	ig with D	ata", 20	16, O'Reil	ly Media	a				
Web Referenc	es												
1. https://towardsdatascience.com/													

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- 2. https://www.khanacademy.org/math/statistics-probability
- 3. https://www.frenchpodcasts.com
- 4. https://www.coursera.org

COs		Progra	am Outcomes (P	Os)		Program Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3		
1	2	3	3	3	3	2	2	2		
2	3	3	2	3	2	3	3	2		
3	2	2	3	3	2	3	3	2		
4	3	3	2	2	2	3	3	3		
5	2	2	2	3	3	3	2	2		

Correlation Level: 1 - Low, 2 - Medium, 3 – High

# **Evaluation Method**

	(	Contin	uous Ass	s (CAM)	End		
Assessment	CAT 1	CAT Model 2 Exam Assignme	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks	
Marks 10		0	5	5	5	75	100

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Department	Compu	tational Studi	es	Programme: B.Sc Data Science and Analytics.							
Semester	SECON	ID		Course MID	Catego	ory Cod	e: *Eno TE	d Semeste	er Exam	Type:	
Course Code		חכטכט		Peri	ods / W	eek	Credit	Maxim	num Mar	ks	
	AZ4DA			L	Т	Р	С	CAM	ESE	TM	
Course Name	Founda	ations of Data	Science - II	4	0	0	4	25	75	100	
Prerequisite	Basic D	ata Science K	nowledge								
Course	After co	mpletion of the	e course, the students	s will be able	e to				Highest (Highest Level)		
Outcome	CO1	Formulate ar assignment p	nd find optimal solut problems involving co	ion in the nditions and	real life I resour	optimi ce cons	zing / allo straints.	ocation /	K2		
	CO2	Optimize effe	ctively through LP me	ethods and	solve us	sing R p	orogrammi	ng	K	2	
	CO3	<b>CO3</b> solve transportation problems regarding determination of supply to various destinations								K3	
	CO4	CO4 Understand the application of Assignment models								K4	
	CO5	CO5 Understand the usage of Minimal tree problems and Simulation for Solving Business Problems									
UNIT-I	DATA VISUALIZATION Periods:							: 12			
Introduction to Visualization, Introduction to Tableau, Dimensions, and measures, descriptive statistics, basic charts, Dashboard Design and principle, Integrate, Tableau with Google sheet.											
UNIT-II	REAL	REAL-TIME APPLICATIONS OF DATA SCIENCE Periods: 12									
Applications of D of Big data - Unc	)ata scier derstandi	nce – Impleme ng and its use.	ntation in different se	ctors, Advar	ntages a	and Dis	advantage	s, Explora	ition	CO2	
UNIT-III	BIG DA	TA ANALYTI	CS				Periods	: 12			
Terminologies – Pig.	Introduct	ion to NoSQL,	Hadoop, MongoDB,	JSON, Cas	sandra,	MapRe	educe Prog	jramming,	Hive,	CO3	
UNIT-IV	MACHI	NE LEARNING	3				Periods	: 12			
Regression Mod Support Vector N	el – Clus ⁄Iachine	tering – Collab	orative Filtering –Ass	ociation Ru	le Minir	ng - Dec	cision Tree	s, Naive E	Bayes,	CO4	
UNIT-V	DATA	ANALYTICS C	ON TEXT				Periods	: 12			
Major Text Minin Analytics sub-tas Stemming.	g Areas - sks: Clea	- Information F ning and Parsi	Retrieval – Data Minin ng, Searching, Retrie	g – Natural eval, Text Mi	Langua ning, Pa	age Pro art-of-S	cessing (N peech Tag	LP) – Tex ging,	t	CO5	
Lecture Periods	s: 60	Tut	orial Periods: -	Practic	al Perio	ods: -		Total Pe	eriods:	<b>30</b>	
Text Books											
<ol> <li>Cathy O'Neil and Rachel Schutt, "Doing Data Science, Straight Talk from The Frontline", O'Reilly, 2021.</li> <li>Jiawei Han, Micheline Kamber and Jian Pei, "Data Mining: Concepts and Techniques", Third Edition. 2018.</li> </ol>											
Reference Bool	ks				( D )	<b>.</b> .	000	–			
1.Sanjeev Wagh	, Manish	a Bhende, Anu	iradha Thakare, 'Fun	damentals o	ot Data	Science	e, CRC Pre	ess, 1st Eo	dition, 20	)22.	
2.Gilbert Strang,	"Linear /	Algebra and Its	Applications", New Y	/ork: Acade	mic Pre	ss, Fou	irth edition	2018.			
3.Seema Acharya, Subhasini Chellappan, Big Data Analytics, 2nd Edition, Wiley, 2019.											

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4. Suresh Kumar Mukhiya, Usman Ahmad "Hands-On Exploratory Data Analysis with Python" 1st Edition 2020.

# Web References

- 1. https://www.rfi.fr
- 2. https://www.lemonde.fr
- 3. https://www.frenchpodcasts.com
- 4. https://www.coursera.org.

### COs/POs/PSOs Mapping

COs		Progra	am Outcomes (P	Os)		Program Specific Outcomes (PSOs					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3			
1	2	3	3	3	3	2	2	2			
2	3	3	2	3	2	3	3	2			
3	2	2	3	3	2	3	3	2			
4	3	3	2	2	2	3	3	3			
5	2	2	2	3	3	3	2	2			

Correlation Level: 1 - Low, 2 - Medium, 3 – High

# **Evaluation Method**

		Contin	uous As	sessment Mark	s (CAM)	End				
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks			
Marks	10		5	5	5	75	100			

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Department	Computational Studies Programme: B.Sc Data Science and Analyt											
Semester	SECO	ND	Course MLD	Catego	ory Code	: *En TE	d Semes	Semester Exam Type Maximum Marks				
		IM2020	Peri	ods / W	'eek	Credit	Ma	auytics.         ester Exam Tyl         Maximum Mark         ESE       1         75       1         t of profession         settings such         vritten English         h various writt         BT Mappin         (Highes)         Level)         nd       K3         s       K3         este       K3         ste       K3         of       Cto         of       Cto         of       Cto         of       Cto         of       Cto         of       Cto         of       Cto	/larks			
Course Code	AZ4EI	NM202C	L	Т	P	С	IM	ESE	TM			
Course Name	Profes Englis	ssional Communication in h	3	0	0	3	25	rtics.         ir Exam Type         imum Marks         ESE       TI         75       10         f       profession         f       profession         tings       such a         en       English         'arious       writte         BT Mappin (Highest Level)       K3         K3       K3         K3       K3         K3       COr         es of       CO	100			
Prerequisite												
Course Objectives	<ul> <li>To com</li> <li>To e inter</li> <li>To profi</li> <li>To med</li> <li>To e</li> </ul>	<ul> <li>To develop proficiency in all four language skills [LSRW] in the context of profection communication in English.</li> <li>To enhance speaking skills to communicate effectively in various professional settings stinterviews and discussions.</li> <li>To improve reading and comprehension skills to understand spoken and written Englishing professional and general contexts.</li> <li>To enhance writing skills to effectively convey ideas and information through various mediums like letters, resumes, emails and reports and</li> <li>To explore the different types of writing.</li> </ul>										
Course	After o	ompletion of the course, the stud	dents will be	e able to	D			BT M (Hig Le	apping ghest vel)			
Semester         SECOND         Course Category Code:         Tend Semester Exam Try Te           Course Code         A24ENM202C         L         T         P         C         IML         ESE T           Course Name         Professional Communication in English         3         0         0         3         25         75         1           Prerequisite         • To develop proficiency in all four language skills [LSRW] in the context of profession communication in English.         • To enhance speaking skills to communicate effectively in various professional settings such interviews and discussions.         • To enhance speaking skills to communicate effectively in various professional asettings such interviews and discussions.         • To enhance writing skills to effectively convey ideas and information through various writ mediums like letters, resumes, emails and reports and • To explore the different types of writing.         BT Mappi (Highes)           Course Outcome         Col         Apply communication skills in order to overcome communication barriers, and adpt individual communication skills to varie profice inportant points.         K3           Course Outcome         Col         Apply communication skills to style to different points.         K3           Cod         Demostrate proficiency in listening to understand spoken English in various effectively.         K3           Cod         Apply communication skills to effectively conve divents and listo to baple to synthesize and summarize important points. ext	<b>(</b> 3											
	CO2	<b>CO2</b> Demonstrate proficiency in listening to understand spoken English in various contexts and also to be able to synthesize and summarize important points.										
	CO3	<b>CO3</b> Exhibit effective speaking skills by communicating eloquently and confidently in professional contexts like seminars, group discussions and interviews by learning to generate ideas and present them in a structured manner.										
	CO4	<b>;O4</b> Display improved reading skills by comprehending and analysing texts to <b>K3</b> extract relevant information and identify main ideas to evaluate critically.										
	CO5	Produce well-written docum essays, reports and profest language and formatting.	ents like ssional cc	busines prrespor	s letter dence	;, <b>КЗ</b> е						
UNIT-I	BAS	SIC COMMUNICATION SKILLS				Peric	ods: 09					
Introduction; re communicatior	elevance n; overco	of communication; communication ming barriers; frames of reference	on process ce.	; types o	of comm	unication; ba	arriers to		C01			
UNIT-II	LIS	TENING				Peric	ods: 09					
Types of listen	ning; barr	iers to effective listening; listening	g and note	taking;	identifyir	ig important	points;		CO2			
extracting salie	ent points	s to summarize.										
UNIT-III	SPE	AKING				Peric	ods: 09					
Dublic cooling	ng; Settin	g clear objectives; generating ide	eas; prepari	ng the s	speech;	seminars; pu	urpose of		C03			
seminars; mak	king note:	s to speak from; presentations; st	tructure of	presenta f intervie	ations; g	ic interview	structure	es of	003			
seminars; mak group discussi	ions and	s to speak from; presentations; si topics; group dynamics; interviev DING	tructure of vs; types of	present f intervie	ations; g ews; bas	ic interview	structure	es of	003			
Seminars; mak group discussi UNIT-IV Comprehensio word parts and	king note: ions and <b>REAI</b> on, skimn d context	s to speak from; presentations; si topics; group dynamics; interview DING ning, scanning, intensive reading clues; identifying the central argu	tructure of ws; types of , extensive ument as w	presenta f intervie reading vell as d	ations; g ews; bas g, determ letails	ic interview Peric	structure ods: 09 ulary from	es of	CO4			

R.D. Moundlings



Functional grammar; spelling and	punctuation: vocabulary; cor	mmon errors; e-mails; resumes; re	port writing;	CO5					
note-making; description; narratio	n; essay and paragraph writi	ng.		005					
Lecture Periods: 45	Tutorial Periods: -	Practical Periods: -	Total Periods	s: 45					
Text Books									
<ol> <li>Billingham, Jo, and Beatrice Ba</li> <li>Cholij, Mark. Towards Academi</li> <li>Dutt, Kiranmai P, et al. A Cours</li> <li>Mohan, Krishna, and Meera Ba</li> <li>Murphy, Raymond. Intermediate</li> </ol>	umgartner Cohen. Giving Pr c English: Developing Effect e in Communication Skills. C nerji. Developing communica e English Grammar. Cambrid	esentations. Oxford University Pre ive Writing Skills. CUP, 2007. Cambridge University Press, 2008. ation skills. Macmillan, 2016. dge University Press, 2012.	ss, 2003.						
Reference Books									
<ol> <li>Prasad, Hari Mohan. How to Prepare for Group Discussion and Interview. Tata McGraw-Hill Publishing Company, 1998.</li> <li>Seely, John. Oxford Guide to Effective Writing and Speaking: How to Communicate Clearly. Oxford University Press, 2013.</li> <li>Tickoo, Champa, and Jaya Sasikumar. Writing with a Purpose. Generic Publishers, 2014. Ur, Penny. Discussions That Work. Cambridge University Press, 1981</li> <li>Ogidi, O. C. Study Speaking: A Course in Spoken English for Academic Purposes. CUP, 1993.</li> </ol>									
Web References 1. https://unm5.unm.edu/5-resear 2. https://ebooks.inflibnet.ac.in/mg 3. https://www.baycollege.edu/_repdf 4. https://www.summitlearning.org 5. https://sde.uoc.ac.in/sites/defau Functional%20Grammar%20and%	ch-COMMUNICATION-skills mtp07/chapter/importance-t sources/pdf/academics/acad //docs/63364 /lt/files/sde_videos/SLM-1%2 %20Communication%20in%2	.html ypes-of-listening/ demic-resources/open-education/p 0Sem%20English- 20English%20(Scrutinized%20Fina	rinciples-publics	peaking					

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COs		Program Outcomes (POs)								
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3		
1	3	2	2	3	2	2	2	3		
2	3	3	2	2	3	2	3	3		
3	3	2	3	2	1	2	1	2		
4	3	3	3	3	2	1	2	2		
5	3	2	2	2	3	2	2	3		

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Method**

	(	Contin	uous As	sessment Marks	s (CAM)	End	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	10		5	5	5	75	100

XZ

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Department	Compu	tational Studies	Programme: B.Sc Data Science and Analytics								
Semester	SECON	ID	Cour AEC	se Cate	gory Co	de: *Er TE	nd Sem	ester Exa	m Type:		
	A 0.4TA	T0000	P	eriods /	Week	Credit	Credit Maximur		larks		
Course Code	A241A	1202C	L	Т	Р	С	CA M	ESE	ТМ		
Course Name	TAMIL ·	-	2	0	0	2	25	75	100		
(Common to B. B.COM CS.,)	.A, B.Sc	., BBA., B.COM., BCA.,									
Prerequisite							_				
	BT Mapping (Highest Level										
Course இலக்கியங்கள் உணர்த்தும் வாழ்வியல் நெறிமுறைகளைப் Outcome பேணிநடத்தல்.									2		
	CO2	நமது எண்ணத்தை வெளிப்ப( பயன்படுத்துதல்.	டுத்தும்	கருவியா	ாகத் தாட	ப்மொழியை	ய்	K	3		
	CO3	தகவல் தெடர்புக்குத் தாய்பெ	மாழியின்	முக்கிய	பத்துவத்	தை உணர்	தல்.	K	3		
	CO4	தாய்மொழியின் சிறப்பை அறி	ிதல்.					K	4		
	CO5	இலக்கிய இன்பங்களை நுகர	நம் திற	ன்களை	வளர்த்த	ல்.		K	4		
UNIT-I	காப்பிய	ம்				Periods	: 09				
சிலப்பதிகாரம் - வ	ழக்குரைக	ளதைனிகாவியுகுநீரும்…முதல் (	தோற்றா	ன் உயிர்	ர்வரை (8	3 வரிகள்)					
மணிமேகலை -பஎ 121வரிகள்)	ரிக்கழைபு	க்ககாதைனிமதுமலர்க் கூந்தல்	ல்முதல	ல் புறம	றிப் பா	ராய் வழை	J(106-				
பெரியபுராணம் -(	இளையான	ர்குடிமாறநாயனார்புராணம் -	ீஉள்	ாம் அ	<mark>டின்ப</mark> ுகொ	ண்டு…(17	ஆவது				
பாடல்மட்டும்)								CC	)1		
கம்பராமாயணம் -	கும்பகர்ண	ாவதைப்படலம் - உறங்குகின்ற	கும்பகள்	ர்ன… (4	5ஆவது	பாடல் மட்(	ரம்)				
தேம்பாவணி -பாலட • • •	மாட்சிப்பட	லம் - ஊட்டினார்அருள்…(229	பாடல்ம	ட்டும்)	• • /	15	•				
சநாபபுராணம் - ம மட்டும்)	ழையழைப	பபத்தப் படலம் - வேயனைமு	நித்துஎன	னத தெ	ாடங்கும(	ாஆவது	பாடல				
UNIT-II	பதினெ	<u></u> ன் கீழ்க்கணக்கு நூல்கள்				Periods	: 09				
திருக்குறள் - வலிய	 பறிதல் (48	8),நெஞ்சொடுகிளத்தல் (125)									
நாலடியார் - அரும்	பெறல்…(	பாடல் எண்:34)									
சிறுபஞ்சமூலம் -பூவ	யாதுகாய்ச்	க்கும்…(பாடல் எண்:22)						cc	)2		
ஐந்திணைஐம்பது - 	சுனைவா வைப்ப	ய்ச் சிறுநீரை…(பாடல் எண்:38) கூடாட்டி என்பாட்டாடல் எண்:38)	)								
களவுமிகாம்பது - கருவ களவுமிகாம்பது - க	⊥ளைகண காட்பினெெ	மலாபோல பூத்தன்(பாடல் எ  ளஞ்சிய (பாடல் எண்:2)	6001:34)								
	 சங்க இ	லக்கியம் - எட்டுத்தொகை				Periods	: 09				
ஐங்குறுநூறு - பாட	ல் எண்:4	4 -தோழி கூற்று			L						
குறுந்தொகை - பா ஈற்றிணை - பாடல்	`∟ல் எண்: எண்.∕284	224 - தலைவி கூற்று - கலைவன் கூற்று									
அகநானூறு - பாட	ல் எண்:14	- தலைவன் கூற்று 45 - செவிலி கூற்று						CC	)3		
புறநானூறு - பாடல்	b <b>எண்:10</b> 2	2னி ஔவையார்									
பரிபாடல் - பாடல்	எண்:3 -	திருமால் வாழ்த்து (1-11வரிகள் பட்டு	<b>T</b> )		Ĩ	Pariada					
	പാലിവാ			NT(25 47	<u> </u>	Fellous	. UJ				
்பாருநராநழுப்படை சிறு ரணாம்வப்படை	- வாயும - பைக்க	யடித்துய…முதல் பெருந்தகுபா னைஅவரை முகல் வென்றிவே	புலால் மார் எ	ர(∠ə-47) ப்கின் வ	, மா (164	4-173)					
பரும்பாணாந்நுப்ப	ைபற்ற டை-பார்ன	வயாத்த…முதல் பதம் மிகப் ப	பருகுவீர்	പ് <u>ട</u> ാണ് വി വന്നെ (9	(10- 95-105)	110)					
குறிஞ்சிப்பாட்டு -அ	<b>ண்ணல்</b> (	நடுங்கோடு…முதல் சிவந்தகன	ன்ணேம்	வரை(54.	·61)			CC	14		
மதுரைக்காஞ்சி -ை	மபடுபெரு	ந்தோள்முதல் பெரும்பெயர்	மதுரை	வரை (	687-699)		_				
நெடுநல்வாடை -கு	ளிர்காலக்க	காட்சி- கல்லென் துவலைத்…ழ யல்கி ைக்கியா	<u>ழதல்</u> ப	ண்ணுமுல	றைநிறுப்ப	பவரை (64- 	-70)				
UNII-V	ுமாழப	INIT-V மொழிப்பயிற்சி, இலக்கியவரலாறு Periods: 09									

R.D. Mounthings

X2

1.முதல்,கரு,உரிப்பொருள் அறிதல் 2.அலகிட்டுவாய்ப்பாடு 3.அணிகள் அறிதல் இலக்கியவரலாறு காப்பியம்,அறஇலக்கியம்,சங்க இலக்	ந்கியம் குறித்தப் பாடப்ப	குதியைஒட்டிய இலக்கியவரலாறு.	CO5
Lecture Periods: 45	<b>Tutorial Periods: -</b>	Practical Periods: -	Total Periods: 45
Text Books			
<ol> <li>சிவகுமார்,எஸ்., -கொங்குதேர்வா முதற்பதிப்பு.2003.</li> <li>சாமிநாதையர் டாக்டர் உ.வே. கு வெளியீட்டெண்: 277,பெசன்ட் நகர், 3. வேங்கடராமன், வித்துவான்.ஹெச் வெளியீட்டெண்: 277,பெசன்ட் நகர், 4. திருவள்ளுவர்- சேயோன் டாக்ட 108</li> <li>வேங்கடசாமிநாட்டார்,ந.மு., - கா இராயப்பேட்டை,சென்னை -14. முதற</li></ol>	ழ்க்கை, பாடல் தொகுப் ஹந்தொகை மூலமும் உ சென்னைனி 600 090.ள ச். (பதி.) - நந்நிணை மூ சென்னைனி 600 090. ள ர் - திருக்குறள்,மயிலை ர்நாந்பது,களவழிநாந்பது ந்பதிப்பு: 2005.	பு நூல் - தொகுதி -1, யுனைடெட் ூரயும், டாக்டர் உ.வே.சாமிநாதைய ட்டாம் பதிப்புனி 2020. லமும் உரையும்,டாக்டர்உ.வே.சாமிந ட்டாம் பதிப்புனி 2020. ந் திருவள்ளுவர்தமிழ்ச் சங்கம்,184 னிசாரதாபதிப்பகம்,சாந்திஅடுக்ககம்	ரைட்டர்ஸ்,சென்னை -86. பர் நூல் நிலையம், நாதையர் நூல் நிலையம் I,பிராட்வே,சென்னை 600 , ஸ்ரீகிரூ'ணபுரம் தெரு,
Reference Books			
<ol> <li>சிந்பிபாலசுப்பிரமணியம் மந்றும் அகாதெமி, புதுடெல்லி, 2013.</li> <li>பாக்கியமேரி, வகைமை நோக்க சென்னை,</li> <li>ஆனந்தன். சு. முனைவர்., - த 2015.</li> <li>பரந்தாமனார்,அ.கி.நல்லதமிழ் எரு 5. சம்பத், இரா., (பதி) -தொல்காப் பண்பாட்டுஆராய்ச்சிநிறுவனம், புதுச் Web References</li> </ol>	நீலபத்மநாபன் (ப.ஆசி.) கில் தமிழ் இலக்கிய எ மிழ் இலக்கியவரலாறு,ச ழதவேண்டுமா,பாரிநிலை பியக் கவிதையியல் வடி சேரி-605 001. முதற்பதி	) னிபுதியதமிழ் இலக்கியவரலாறு, ச வரலாறு (செம்மை மற்றும் விரிவுப் 5ண்மணிபதீப்பகம், திருச்சி-2. இருட பம்,சென்னை, 1998. வம்-பாடுபொருள்-உத்தி-வகைமை,புல ப்புனிஅக்டோபர் 2015.	தொகுதி-1,2,3, சாகித்திட பதிப்பு), பாரிநிலையம் பத்தி மூன்றாம் பதிப்புன் துச்சேரிமொழியியல்
1. http://www.tamilvu.org			
2. http://www.tamilweb.com			
3. http://www.tamilkodal.com			
4. www.store.tamillexican.com			
o. www.kaia.tamiiforu.piogspot.com 6. www.noolagam.com	T1		

\* TE – Theory Exam, LE – Lab Exam



R. D. Mounthings

COs		Program Outcomes (POs)									
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3		
1	3	2	3	3	2	2	2	2	3		
2	3	2	2	3	3	3	2	2	2		
3	2	2	2	2	3	3	3	2	2		
4	3	3	2	2	2	2	2	2	3		
5	2	3	2	2	3	3	3	3	3		

Correlation Level: 1 - Low, 2 - Medium, 3 – High Evaluation Method

		Contin	uous Ass	s (CAM)	End Somostor	Total	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks 10		5	5	5	75	100	

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R. D. Mounthings

Department	Compu	tational Studies	Programme: B.Sc Data Science and Analytics								
Semester	SECON	ID	Course AEC	e Categ	ory Coc	le: *En TE	id Seme	ester Exar	n Type:		
Course Code	۵24FR	T202C	Per	iods / W	/eek	Credit	Ma	aximum M	arks		
		12020	L	Т	Р	С	CA M	ESE	ТМ		
Course Name	FRENC	H - II	2	0	0	2	25	75	100		
Prerequisite	French	I	<u>t</u>			<u>.</u>	s	<b>.</b>			
	After the	e completion of this course, t	he stude	nts will k	be able	to:		BT Ma (Highest	pping Level)		
Course	CO1		K3								
Outcome	CO2	Write, compile, and debug	basic pro	grams				K	3		
	CO3	Implement logic with condit	ionals an	nd loops				K	3		
	CO4	Manipulate arrays of variou	s dimens	sions				K	3		
CO5Design and implement functions with recursion.K3											
UNIT-I Introduction to Computer Problem-Solving Periods: 12											
Problem-solving Aspect – Top-down Design – Implementation of Algorithms – Program Verification – Efficiency of Algorithms – Analysis of Algorithms .											
UNIT-II	Basic	programming constructs				Periods	: 12				
Basic Data types (I Run – Debugging	Numerica	I, String) – Variables – Expre	ssions –	I/O stat	ements	– Compile	and	co	02		
UNIT-III Decision Making – Branching & Looping Periods: 12											
Decision making – Branching & Looping – Ferrous, 12 Decision making – Relational Operators – Conditional statement, Looping Statements – Nested											
Decision making – loops – Infinite loop	Relation	al Operators – Conditional s ch Statements	tatement	t, Loopir	ng State	ements – N	ested	co	)3		
Decision making – loops – Infinite loop	Relation os – Swite Array	al Operators – Conditional s ch Statements Techniques	tatement	t, Loopir	ng State	Periods	ested	CC	)3		
Decision making – loops – Infinite loop <b>UNIT-IV</b> Array Manipulation Multidimensional A	Relation os – Swite Array – Differe rray – Ch	al Operators – Conditional s ch Statements <b>Techniques</b> nt operations – One dimensional strings	tatement	t, Loopir 1y – Twc	ng State	ements – N Periods sional Array	: 12 : 12 / -	cc	)3 )4		
Decision making – loops – Infinite loop UNIT-IV Array Manipulation Multidimensional A UNIT-V	Relation Dos – Swite Array – Differe rray – Ch Modul	al Operators – Conditional s ch Statements <b>Techniques</b> nt operations – One dimensionaracter – Arrays and Strings ar solutions	tatement	t, Loopir iy – Twc	ng State	Periods Periods sional Array Periods	ested : 12 / -	cc	)3 )4		
Decision making – loops – Infinite loop UNIT-IV Array Manipulation Multidimensional A UNIT-V Introduction to Fun Return Values – Lo	Relation os – Swito – Differe rray – Ch Modul nctions – ocal and (	al Operators – Conditional s ch Statements <b>Techniques</b> ant operations – One dimensionaracter – Arrays and Strings ar solutions Importance of Design of F Global Scope – Recursion	tatement	t, Loopir ny – Twc s – Argu	o-dimen uments	Periods Periods sional Array Periods – Paramet	: 12 : 12 / - : 12 : 12 : ers -	cc cc	)3 )4 )5		
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Decision making – loops – Infinite loop UNIT-IV Array Manipulation Multidimensional A UNIT-V Introduction to Fun Return Values – Lo Lecture Periods: 4 Text Books 1. R. G. Dromey, "H 2. Allen B. Downey 2020.	Relation os – Swito – Differe rray – Ch Modul nctions – ocal and C 45	al Operators – Conditional s ch Statements Techniques Int operations – One dimensionaracter – Arrays and Strings ar solutions Importance of Design of F Global Scope – Recursion Tutorial Periods: - olve it by Computer", Pearson Python: How to Think like a C	tatement onal Arra functions <b>Practi</b> on Educati computer	t, Loopir ny – Two a – Argu <b>cal Per</b> i ion India Scientis	o-dimen uments i <b>ods: -</b> a, Thirte st", Thirt	Periods Periods sional Array Periods – Paramet Pen Edition, C	ested : 12 / - : 12 ers - 2013. ?'Reilly	CC CC CC Fotal Peri 15 Publishers	)3 )4 )5 ods: <sub>δ,</sub>		
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Decision making – loops – Infinite loop UNIT-IV Array Manipulation Multidimensional A UNIT-V Introduction to Fun Return Values – Lo Lecture Periods: 4 Text Books 1. R. G. Dromey, "H 2. Allen B. Downey 2020. Reference Books 1. Reema Thareja 2. Karthikeyan E, "	Array – Differe rray – Ch Modul nctions – bcal and ( 45 How to So (, "Think F , "Python 'A Textbo	al Operators – Conditional s ch Statements Techniques Int operations – One dimensionaracter – Arrays and Strings ar solutions Importance of Design of F Global Scope – Recursion Tutorial Periods: - Dive it by Computer", Pearson Python: How to Think like a C Programming: Using Problem pok on C: Fundamentals, Dat	tatement onal Arra functions <b>Practi</b> n Educati computer m Solving a Structu	t, Loopir y – Two <b>cal Per</b> i ion India Scientis g Approa	o-dimen uments iods: - a, Thirte st", Thirt ach", O: Proble	Periods sional Array Periods – Paramet een Edition, C d Edition, C xford Unive m Solving",	<pre></pre>	CC CC CC Fotal Peri 15 Publishers ess, 2019 earning, 2	)3 )4 )5  ods:  5,  5,  008		
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\* TE – Theory Exam, LE – Lab Exam

R.D. Mountings

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	003/103/10	os mapping									
COs		Program Outcomes (POs)									
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3		
1	3	2	3	3	2	2	2	2	3		
2	3	2	2	3	3	3	2	2	2		
3	2	2	2	2	3	3	3	2	2		
4	3	3	2	2	2	2	2	2	3		
5	2	3	2	2	3	3	3	3	3		

Correlation Level: 1 - Low, 2 - Medium, 3 - High

**Evaluation Method** 

_		Continu	ious Asse	essment Marks	(CAM)	End Somostor	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	1	0	5	5	5	75	100

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Department	Compu	utationa	l Studies	Programme: B.Sc Data Science and Analytics.								
Semester	SECO	١D		Cours	e Catego	ory Code	e: <b>SEC</b> *Er	nd Semes	ter Exam	Type: LE		
Course Code	۵2/۵۵	S201D		Per	iods / W	eek	Credit	Ma	ximum N	/larks		
		32010		L	Т	Р	C	CAM	ESE	ТМ		
Course Name	Explor	atory Da	ata Analysis Lab	0	0	6	3	50	50	100		
Prerequisite	Basic k	Knowledg	ge in database									
					, ., .,				BTN	Mapping		
	After th	e compl	etion of this course, t	the stude	nts will b	e able to	D <i>:</i>		/1 lianta			
	CO1	Perfor world	m data loading, trans data	sformatio	n, and pr	eliminar	y analysis	for real-	(Highe	K3		
	CO2	Create patterr	e charts and graphs t ns in data during Exp	o effPect loratory [	ively con Data Ana	nmunica Iysis.	ite and int	erpret		K3		
Course Outcome	CO3	Apply includi	Apply advanced statistical measures to describe and interpret datasets, including measures of central tendency and dispersion <b>K3</b>									
	CO4	Critically evaluate and draw meaningful conclusions from the analysis K4 results.										
	CO5	Demor Time S	nstrate proficiency in Series Analysis (TSA)	handling using Py	time seri rthon.	es data	sets and p	performing		K4		
<ol> <li>Download, Install</li> <li>Visualize the data</li> <li>Perform histogram</li> <li>Write a program to</li> <li>Write a program to</li> <li>Perform Time Se</li> <li>Write a program to</li> <li>Perform EDA on</li> <li>Demonstrate different</li> <li>Develop and evant</li> </ol>	and pra a using m analy to gener to gener tries ana to identi Wine Da erent vis aluate N	actice op various g sis using rate diffe rate pivo llysis and fy the co ata sualizatic /IL mode	ensource tools for El graphs NumPy, Matplotlib, rent charts and plots t using groupby() me d test with with a pre- rrelation of the featur ons based on Exercis Is on open dataset	DA – WE pandas.	KA odel neters in	the Tita	nic Datas	et.				
Lecture Periods:	30		Tutorial Periods: -	· Practi	cal Perio	ods: -		То	tal Perio	ds: 30		
Reference Books												
1. Hands-O Publishing 2. Explorato	n Explo ory Data	ratory Da Analysia	ata Analysis with Pyt s: Uncovering Insight	hon, Sure ts from Yo	esh Kuma our Data,	ar Mukh Daniel	iya, Usma Garfield, 2	n Ahmed 2023, Kind	2020, P Ile Editio	ACKT n		
Web References												
1. https 2. https 3. https	s://pytho s://www s://lectu	onprogra .codecac renotes.i	mming.net/introducti demy.com/learn/learr n	on-learn- ì-python	python-3	-tutorial	s/					

\* TE – Theory Exam, LE – Lab Exam

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COs		Program Outcomes (POs)									Program Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	P06	P07	P08	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	3	3	3	3	2	2	2	3	3	3	3	2	2	2
2	3	3	2	3	2	3	3	2	3	2	3	2	3	3	2
3	2	2	3	3	2	3	3	2	2	3	3	2	3	3	2
4	3	3	2	2	2	3	3	3	3	2	2	2	3	3	3
5	2	2	2	3	3	3	2	2	2	2	3	3	3	2	2

# Correlation Level: 1 - Low, 2 - Medium, 3 - High

# **Evaluation Method**

Assessment		Internal	Marks	End Semester Examination (ESE) Marks	Total Marks
	Model Exam	Record	Attendance	50	100
Marks	30	10	10		

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Department Computational Studies						Programme: <b>B.Sc Data Science and Analytics.</b>						
Semester	SECOND					Cours	se Cate	gory	End Semester Exam Type: <b>TE</b>			
CourseCode	A24VAC202C					Periods/Week			Credit	N	laximu	mMarks
						L 2		P 0	2 2	25 25	ESE 75	1 101
Course Name ENVIRONMENTAL SCIENCES						2	U	U	<b></b>	25	75	100
Programme)	D.\	JO.,D.O	юш., <b>D</b> .D.Л									
Prerequisite	uisite Basic Knowledge and awareness on Enviro											
Course Objectives	To gain knowledge on the importance of natural resources and energy.											
	To know the structure and function of an ecosystem.											
	To imbibe an aesthetic value with respect to biodiversity, understand the threats and its conservation and appreciate the concept of interdependence.											
	To know the causes of types of pollution and disaster management.											
	To observe and discover the surrounding environment through field work.											
Course Outcomes	On completion of the course, the students will be able to								BT Mapping (Highest Level)			
	CO1	CO1 Understand about the various resources								K1		
	CO2	O2 Learn about the biodiversity								K1		
	CO3	CO3 Learn the different types of pollution and to prevent the pollution									K2	
	CO4 Know about the pollution Act								K2			
	CO5 Observe various environmental issues in surroundings								K3			
UNII-I	ENV	IRONN	IENTAL SC	IENCES: I	NATURAL	. RESO	URCES	5	Period	s:06		
Environmental So Mineral resource Environmental im	cience s - Fo pact -	s - Rele ood res fertilize	evance - Sig sources - c er - Pesticido	nificance · onflicts ov e Problems	- Public av er resourc s - case sti	varenes ce shari udies	s - Fore ing - E	est reso xploitati	urces - W ion - Land	ater res d use p	ources attern	_ CO1
UNIT-II	ECOSYSTEM, BIODIVERSITY AND ITS CONSERVATION Periods:06											
Ecosystem - con web - Ecological Definition - genel national (India) a	cept - pyrar tic, spo nd loca	structu nids - I ecies ar al levels	re and func Energy flow nd ecosyste s - Hotspots	tion - prod - Forest, m diversity , threats to	ucers, cor Grasslanc y - Values biodivers	nsumers d, deser and use ity - con	and de t and a es of bi servatio	ecompo aquatic odiversi on of bio	sers - Foo ecosysten ity - biodiv odiversity	od chair n. Biodi versity a –Insitu8	n - Food versity t global Exsitu.	<b>CO2</b>
UNIT-III	ENVIRONMENTAL POLLUTION AND MANAGEMENT Periods:06								s:06			
Environmental P Thermal, Nuclear individuals in pre	ollutio <sup>-</sup> pollut ventio	n - Cau tion and n of pol	uses - Effe d Disaster M lution - pollu	cts and co lanagemen ution case s	ontrol mea nt - Floods studies.	asures o s, Earth	of Air, \ quake,	Water, I Cyclon	Marine, so e and Lan	oil, solic dslides.	l waste Role o	e, <b>CO3</b> If
UNIT-IV	IIT-IV SOCIAL ISSUES - HUMAN POPULATION Perio							Period	s:06			
Urban issues - E Rehabilitation iss and forest cons Environmental H Public awareness	Energy sues - ervatic ealth - s - Cas	/ - wate Enviror on Act HIV/AI se studi	er conserva nmental leg - Populatio DS - Role c es.	ntion - Env islations - n growth of IT in Env	vironmenta Environme and Explo vironment a	I Ethics ental pr osion - and Hur	; - Glot oductio Humai man He	bal wari n Act. 1 n rights alth - W	ming - Re 1986 - Air, and Val /omen and	esettlem Water, ue Edu d child v	ent and Wildlife cation velfare	d CO4 e - -
UNIT-V	FIEL	FIELD WORK Period							s:06			
/isit to a local area / local polluted site / local simple ecosys								:				
Visit to a local are	ea / loo	cal pollu	uted site / lo	cal simple	ecosysten	n - Repo	ort subn	nission.	<b>i</b>			CO5
Visit to a local are Lecture Periods	ea / loo <b>:30</b>	cal pollu	uted site / lo Tutorial P	cal simple eriods:0	ecosysten	n - Repo <b>Pract</b>	ort subn ical Pe	nission. <b>riods:-</b>	Tota	I Perio	ds:30	CO5

R. D. Mounthings



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- 2. BasuMahua, Savarimuthu Xavier, "Fundamentals of Environmental Studies", Cambridge, 2<sup>nd</sup> Edition, 2017.
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- 2. Rajamannar, "Environmental Studies", EVR College Publications, 1<sup>st</sup> Edition, 2004.
- 3. Kalavathy, S, "Environmental Studies", Bishop Heber College Publications, 1<sup>st</sup> Edition, 2004.

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- 3. https://www.youtube.com/watch?v=78prsPYm98g
- 4. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2792934/
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