B. Com C.A SYLLABUS

Allied Syllabus

2025-2026

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE (AUTONOMOUS)

(Affiliated to Bharathidasan University, Tiruchirappalli)(Accreditedby NAAC)|(AnISO9001:2015CertifiedInstitution)

Sundarakkottai,

Mannargudi–614016,

QUESTION PAPER PATTERN

Part A:
Part A1 (4X1=4 marks)
One word question/ Fill in/ True or False/ Multiple Choice Questions
Two Questions from Each unit
Part A2 (3X2=6 marks)
Match the following / Short Answers
One question from Each unit
Total Marks – 10

Part B: (3X5=15 marks)
Paragraph Answers
Either/ or type, One Questions from each unit

Part C: (2X10=20)
Essay Type Answers Answer
3 out of 5 Questions One
Question from each unit

Part A: K1 Level
Part B: K2, K3 and K4 Level
Part C: K5 and K6 Level

Knowledge levels for assessment of Outcomes based on Blooms Taxonomy

S. No.	Level	Parameter	Description
1	K1	Knowledge/Remembering	It is the ability to remember the previously learned
2	K2	Comprehension/ Understanding	The learner explains ideas or concepts
3	K3	Application/Applying	The learner uses information in a new way
4	K4	Analysis/Analysing	The learner distinguishes among different parts
5	K5	Evaluation/Evaluating	The learner justifies a stand or decision
6	K6	Synthesis /Creating	The learner creates a new product or point of view

WEIGHTAGE of K – LEVELS IN QUESTION PAPER

(Cognitive Level) K- LEVELS →	Lower Order Thinking			Higher Order Thinking			Total
	K1	K2	K3	K4	K5	K6	
END SEMESTER EXAMINATIONS (ESE)	10	15			20		**45**
Continuous Internal Assessment (CIA)	10	15			20		**45**

QUESTION PATTERN FOR SEMESTER EXAMINATION/ **Continuous Internal Assessment**		
PART		**MARKS**
PART –A I. (No choice ,One Mark) **TWO** questions from each unit **II.** (No choice ,Two Mark) **ONE** question from each unit	(4x1 =4) (3x2 =6)	**10**
PART -B (Either/ or type ,5-Marks) **ONE** questions from each unit	(3x5 =15)	**15**
PART -C (3 out of 5) (10 Marks) **ONE** question from each unit	(2x10 =20)	**20**
	Total	**45**

BLUE PRINT OF QUESTION PAPER FOR SEMESTER EXAMINATION							
DURATION: 3. 00 Hours.							**Max Mark : 100**
K- LEVELS / **PART**	**K1**	**K2**	**K3**	**K4**	**K5**	**K 6**	**Total Marks**
PART –A (One Mark, No choice) (4x1 =10)	4						**4**
(2-Marks, No choice) (3x2=6)		6					**6**
PART –B (5- Marks) (Either/or type) (3x5=25)			5	10			**15**
PART -C (10 Marks) (2 out of 3) (2x10=20) Courses having only **K5,K6** levels, K5 level- 3 Questions, K6 level- 2 Questions **(One K6 level question is compulsory)**					10	10	**20**
Total	**4**	**6**	**5**	**10**	10	10	**45**

PROGRAMME OUTCOMES FOR B.C.A.,DEGREE PROGRAMMES

PO No.	Programme Outcomes (*Upon completion of the B.C.A. Degree Programme, the Undergraduate will be able to)*
PO-1	**Disciplinary knowledge**: Demonstrate comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate program of study in Bachelor Of Computer Applications.
PO-2	**Critical thinking, Problem Solving and Reflective thinking:** think critically about the issues and identify, critically analyze and solve problems from the disciplines of concern using appropriate tools and techniques and the knowledge, skills and attitudes acquired and extrapolate the same to real life situations; show critical sensibility to life experiences, with self awareness and reflexivity of both self and society.
PO-3	**Analytical & Scientific Reasoning:** evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyze and synthesize data from a variety of sources; draw valid conclusions and support them with evidence and examples and addressing opposing viewpoints; critically evaluate ideas, evidence, and experiences from an open minded and reasoned perspective.
PO-4	**Research-related Skills:** develop a sense of capability for relevant/appropriate inquiry and asking questions, synthesize, articulate and report results and to recognize and predict cause and effect relationships, define problems, formulate and establish hypothesis, analyze and interpret and draw conclusions from data, execute and report the results of an experiment or investigation.
PO-5	**Digital literacy and Effective Communication:** use ICT in a variety of learning situations and **s**peak, read, write and listen clearly in person and through electronic media in English and in one or more Indian languages, and make meaning of the world by connecting people, ideas ,books, media and technology; efficiently communicate thoughts and ideas in a clear and concise manner.
PO-6	**Individual and Team Work:** effectively accomplish tasks individually as well as work effectively and respectfully as member or leader with diverse teams, facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interest so for a common cause and work efficiently as a member of a team.
PO-7	**Multicultural Competence and Social Interaction:** understand the values and beliefs of multiple cultures, global perspectives, engage and interact respectfully with diverse groups and elicit views of others, mediate disagreements and help reach conclusions in group settings.
PO-8	**Awareness of Ethical issues, Human values and Gender Issues:** embrace moral/ethical values in conducting one's life, formulate a position/argument about an ethical issue from multiple perspectives, and use ethical practices in all work and understand the value of relationship between self and the community and aware of the various issues concerning women and society.
PO-9	**Awareness of Environment and Sustainability:** understand the impacts of technology and business practices in societal and environmental contexts, and sustainable development.
PO-10	**Self-directed and Lifelong learning:** acquire knowledge and skills, including learning "how to learn", that are necessary for participating in learning activities throughout life and to engage in independent and life-long learning in the broadest context of socio-Technological changes.

PROGRAMME SPECIFIC OUTCOME (PSO)

PSO No.	Program Specific Outcomes (B.C.A., DEGREE)
PSO1	Think in a critical and logical based manner
PSO2	Familiarize the students with suitable software tools of computer science and industrial applications to handle issues and solve problems in mathematics or statistics and real time application related sciences.
PSO3	Know when there is a need for information, to be able to identify, locate, evaluate, and effectively use that information for the issue or problem at hand.
PSO4	Understand, formulate, develop programming model with logical approaches to a address issues arising in social science, business and other contexts.
PSO5	Acquire good knowledge and understanding to solve specific theoretical and applied problems in advanced areas of Computer science and Industrial statistics.

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS)

(Affiliated to Bharathidasan University)

(Accredited by NAAC |An ISO 9001:2015 Certified Institution)

SUNDARAKKOTTAI, MANNARGUDI–614016,

TAMILNADU,INDIA.

BACHELOR OF COMMERCE COMPUTER APPLICATIONS
COURSE STRUCTURE UNDER CBCS
LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS-LOCF)

(For the candidates admitted in the academic year2025-2026)

Sem	Part	Nature of the Course	Course Code	Title of the Course	Inst. Hour / Week	L	T	P	S	Credit	Exam Hours	Marks		Total
												CIA	ESE.	
I	III	Allied Course (AC) –I	U25ACA101A	Programming in C and Lab	4	2	-	2	-	3	(2+2)	25	75	100
	III	Allied Course (AC)-I	U25ACA101B	Python Programming and Lab	4	2	-	2	-	3	(2+2)	25	75	100
II	III	Allied Course (AC) – II	U25ACA202A	Office Automation and Lab	4	2	-	2	-	3	(2+2)	25	75	100
	III	Allied Course (AC)–II	U25AC5A202B	Programming in C++ and Lab	4	2	-	2	-	3	(2+2)	25	75	100
III	III	Allied Course (AC)– III	U25ACA303A	Programming in Java and Lab	3	1	-	2	-	3	(2+2)	25	75	100
	III	Allied Course (AC)– III	U25ACA303B	Web Technology (PHP) and Lab	3	1	-	2	-	3	(2+2)	25	75	100
IV	III	Allied Course (AC)– IV	U25ACA404A	Relational Database Management System and Lab	4	3	1	-	-	3	(2+2)	25	75	100
	III	Allied Course (AC)– IV	U25ACA404B	Introduction to Data Science and Lab	4	3	1	-	-	3	(2+2)	25	75	100

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS)

SUNDARAKKOTTAI, MANNARGUDI-614016.

(For the Candidates admitted in the academic year 2025–2026)

DEPARTMENT OF COMPUTER APPLICATIONS

Semester: III Allied Course III (a) –Programming in Java and Lab

Ins. Hrs./Week: 3 **Course Credit: 3** **Course Code: U25ACA303A**

(Theory -60 Marks UE: 45 Marks IA:15 Marks)

Unit I: Introduction of OOP

Object Oriented Programming: Introduction to OOP– Objects and Classes–Characteristics of OOP –Introduction to java Programming: Introduction–Comparing java and Other Languages – Applications and Applets – Complex Programs – Java Source File Structure.

Unit II : Java Language Fundamentals

The Building Blocks of Java–Data Types– Variable Declarations – Object Reference Variable – – Initializing Local Reference Variables – Wrapper Classes – Operators and Assignment – Control Structures –Arrays – One Dimensional Arrays – Two Dimensional Array -Applets: Introduction– Java Applications versus Java Applets – Applet Life cycle – Working with Applets.

Unit III: Exception Handling and Thread

Exception Handling: Introduction–Basics of Exception Handling–Exception Hierarchy– Constructors and Methods in Throwable Class– Handling Exceptions in Java – Exception and Inheritance – Throwing User-defined Exceptions –Multithreading : Introduction – Creating Threads –Thread Life-cycle– Thread Priorities and Thread Scheduling– Thread Synchronization.

******

(Practical -40 Marks UE:30 Marks IA:10 Marks)

Unit IV:

1. Write a program to sort the given numbers using arrays.
2. Write a program to implement the FIND and REPLACE operations in the given multiple text.
3. Write a program to implement a calculator to perform basic Arithmetic Operations.
4. Write a program to find the area of a rectangle using constructor.
5. Implement multiple inheritance concepts in java using interface, you can choose your own exam a company or education institution or a general concept which requires the use of interface to so particular problems.

Unit – V:

6. Write a program to find the student's percentage and grade using command Line arguments.
7. Write a program to draw circle or triangle or square using polymorphism and inheritance.
8. Write a program to insert image using Applet and develop animation.
9. Write a program to create threads and assign priorities to them.
10. Write a program to create a window with three check boxes called red, Green and blue. The apple should change the colors according to the selection.

COURSE OUTCOMES

Upon the completion of the course, the students will able to

. 1.Understand the java programming concepts.

1. Develop programs using java programming language constructs.
2. Create User-Defined functions.
3. Understand the java programming concepts by writing simple programs
4. Write programs using java programming language constructs

TEXT BOOKS

1. Radha Krishna, P.2007. Object Oriented Programming through Java.First Edition,University Pre
2. Rizwan Ahmed .P. 2017. Java Programming. Margham Publications, Chennai.

REFERENCE BOOKS

1. Cay S.Horstmann. 2020. Core Java Volume-I Fundamental. Eleventh Edition, Pearson Publication.
2. Ken Arnold ,James Gosling, David Holmes. 2007. The Java Programming Language. Third Edition, Pearson Publication.
3. Muthu C. 2006. Essential of Java Programming. Second Edition, Vijay Nicole imprints Private Limi Chennai.
4. Radha Krishna, P. 2017. Object Oriented Programming through Java.First Edition, Delhi University Press.
5. Rizwan Ahmed .P. 2017. Java Programming. Margham Publications, Chennai.

E-RESOURCES

1. https://www.tutorialspoint.com
2. https://www.codecademy.com/learn/learn-java
3. https://www.learnjavaonline.org.
4. https://www.geeksforgeeks.org/java/?ref=ghm
5. https://www.geeksforgeeks.org/variables-in-java/

MAPPING WITH PROGRAM OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	**3**	**3**	**2**	**3**	**3**	**3**		**2**		**2**	**3**	**2**	**2**	**3**	**3**
CO2	**3**	**3**		**3**	**3**			**2**		**3**	**3**		**2**		**2**
CO3	**3**		**2**	**3**	**3**			**2**		**3**	**3**	**3**	**2**		**2**
CO4	**3**	**3**	**3**	**3**	**3**			**2**		**3**	**3**	**3**	**2**		**2**
CO5	**3**		**3**	**3**	**3**			**3**		**2**	**3**	**2**	**2**		**3**

S-Strong(3) **M-Medium(2)** **L-Low(1)**

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS)

SUNDARAKKOTTAI, MANNARGUDI-614016.

(For the Candidates admitted in the academic year 2025–2026)

DEPARTMENT OF COMPUTER APPLICATIONS

Semester: III Allied Course III (b) – Web Technology(PHP) and Lab

Ins. Hrs./Week: 3 **Course Credit: 3** **Course Code:U25ACA303B**

(Theory -60 Marks UE: 45 Marks IA:15 Marks)

Unit I: Introduction to HTML

Structuring Documents for the Web: Introducing HTML and XHTML, Basic Text Formatting, Presentational Elements, Lists, Editing Text, Core Elements and Attributes, Attribute Groups. Links and Navigation: Basic Links, Creating Links with the Element, Advanced E- mail Links. Images, Audio, and Video: Adding Images Using the Error! Filename not specified. Element, Using Images as Links, Image Maps, Choosing the Right Image Format.

Unit II: Tables, Forms, Frames

Tables: Introducing Tables, Grouping Section of a Table, Nested Tables, Accessing Tables. Forms: Introducing Forms, Form Controls, Sending Form Data to the Server. Frames: Introducing Frameset, Element, Creating Links Between Frames, setting a Default Target Frame Using Element, Nested Framesets, Inline or Floating Frames with <iframe> - GUI – creating windows.

Unit III: Essential PHP

Variables, Constants, Understanding Internal Data types in PHP – Operators and Flow Control Strings and Arrays: The String Functions, PHP Array Functions, Handling Multi-Dimensional Arrays. Creating Functions – Reading Data in Web pages: Setting up Web Pages to communicate with PHP, Handling Form Input Elements– PHP Browser – Handling Power. – Working with Databases and Using PHP with MYSQL: Connecting to MYSQL – Executing and retrieving Simple Queries.

******

(Practical -40 Marks UE:30 Marks IA:10 Marks)

Unit IV:

1. Write a program to find the factorial of a number.
2. Write a program using Conditional Statements need a number N and check whether it is divisible by M
3. Write a program to find the maximum value in a given multi-dimensional array.
4. Write a program to find the GCD of two numbers using user-defined functions.
5. Design a simple web page to generate multiplication table for a given number.

Unit – V:

6. Design a web page that should compute one's age on a given date.
7. Write a program to download a file from the server.
8. Write a program to store page views count in SESSION, to increment the count on each refresh a show the count on web page.
9. Write a program to design a simple calculator.
10. Design an authentication web page in PHP with MySQL to check username and password.

COURSE OUTCOMES

Upon the completion of the course, the students will able to

1. Implement various HTML tags to design simple web pages
2. Understand the scripting language Java Script
3. Understand operators and controls in PHP.
4. Learn PHP programming on handling strings and arrays.
5. Design web pages for different applications with MYSQL

TEXT BOOKS

1. Chris Bates, "Web Programming", Wiley Publishing 3d Edition.
2. M. Srinivasan, "Web Technology: Theory and Practice", Pearson Publication

REFERENCE BOOKS

1. Larry Ullman. 2017. PHP 6 and MySQL 5 for Dynamic websites: Visual Quick Pro Guide. Third Edition, Peachpit Press, San Francisco, USA.
2. Bruce Dou. 2020. Mastering Swoole PHP: Build High Performance Concurrent System with Async an Coroutines".First Edition, Transfon Ltd, UK.
3. Doug Bierer.2016. PHP 7 Programming Cookbook.First Edition, Packt Publishing, Mumbai.
4. Gunnard Engebreth.2021. PHP 8 Revealed.First Edition, First Edition, Apress Publications, US
5. Mikael Olsson. 2020. PHP 8 Quick Scripting Reference.Third Edition, Apress Publications, US
6. Vikram Vaswani. 2008. PHP:ABeginner'sGuide. First Edition, McGrawHillEducation, New Delhi.

E-RESOURCES

1. https://www.w3schools.com/js/
2. https://www.geeksforgeeks.org/html-introduction/
3. https://www.phppoint.com.
4. https://www.nptelvideos.com/php/php_video_tutorials.php.
5. https://www.tutorialspoint.com/php/index.htm.

MAPPING WITH PROGRAM OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	**3**	**3**	**2**	**3**	**3**	**3**		**2**		**2**	**3**	**2**	**2**	**3**	**3**
CO2	**3**	**3**		**3**	**3**			**2**		**3**	**3**		**2**		**2**
CO3	**3**		**2**	**3**	**3**			**2**		**3**	**3**	**3**	**2**		**2**
CO4	**3**	**3**	**3**	**3**	**3**			**2**		**3**	**3**	**3**	**2**		**2**
CO5	**3**		**3**	**3**	**3**			**3**		**2**	**3**	**2**	**2**		**3**

S-Strong(3) **M-Medium(2)** **L-Low(1)**

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)
SUNDARAKKOTTAI, MANNARGUDI-614016.
(For the Candidates admitted in the academic year 2025–2026)

DEPARTMENT OF COMPUTER APPLICATIONS

Semester: IV Allied Course IV (a) – Relational Database Management System and Lab

Ins. Hrs./Week: 3 **Course Credit: 3** **Course Code: U25ACA404A**

(Theory -60 Marks UE: 45 Marks IA:15 Marks)

Unit I: Introduction

Introduction – purpose of database systems – Data Abstraction – Data models – Instances and schemes – Data independence – DDL – DML – Database users – ER model – Entity sets – Keys – ER diagram – relational model – Structure – Relations Algebra – Relational Calculus – Views.

Unit II : SQL

SQL – QBE – QUEL – Basic structure – various Operations – Relational database design problems in the relational data base design – Normalisation – normalization using functional, Multi value and join dependencies- File and system structure – overall system structure – file Organization – data dictionary

Unit III: Transaction

Recovery and atomicity – failures classification and types – Transaction model and Log based recovery, schedules – serial and non-serial types – Serialization of schedules and views – testing for seriability – lock based protocols – time based protocols – validation techniques – multiple Granularity – multiversion schemes – insert and delete Operations. Distributed data bases – structure of distributed databases – Trade offs in Distributing the database.

******

(Practical -40 Marks UE:30 Marks IA:10 Marks)

Unit IV:

1. Creating & updating and inserting into database & simple queries.
2. Uses of Select statement - for queries.
   a. AND' OR' NOT Operators' WHERE clause.
   b. UNION' INTERSECTION' MINUS.
   c. Sorting and grouping.
3. Nested queries using SQL.
   a. Sub queries.
   b. Join.

Unit – V:

4. Built-in-functions of SQL.
5. Use of indexes' creating views and querying in views.
6. Cursors' triggers and stored procedures and functions.
7. Case studies:
   a. Student evaluation systems.
   b. Pay - roll system
   c. Income tax calculations.
   d. Seat reservation Problems
   e. Mark - sheet Preparation.

COURSE OUTCOMES

Upon the completion of the course, the students will able to

1. Understand the basic concepts of database management systems
2. **Identify** and solve design problems through normalization (1NF to 5NF) using functional, multivalued, and join dependencies..
3. **Analyze** different schedule types and test for serializability.
4. **Construct** nested queries, subqueries, and perform JOIN operations.
5. **Create and manipulate** indexes, views, and write queries using views.

TEXT BOOKS

1. Henry F. Korth, and Abraham Silberschatz,, Sudarshan “Database system Concepts”, McGraw Hi 4th Edition, 2002.

REFERENCES BOOK

1. Pipin C. Desai, “An Introduction to data base systems”, Galgotia Publications Private Limited,1999.
2. C.J. Date, “An Introduction to Database Systems”, 3rd Edition, Addison Wesley 1983.
3. Database System Concepts by Abraham Silberschatz, Henry F. Korth, and S. Sudarshan.
4. Fundamentals of Database Systems by Ramez Elmasri and Shamkant B. Navathe.
5. An Introduction to Database Systems" by C.J. Date.

E-RESOURCES

1. https://nptel.ac.in/courses/106/105/106105175/
2. https://onlinecourses.nptel.ac.in/noc21_cs04/
3. https://nptel.ac.in/courses/106/106/10610
4. https://www.w3schools.com/sql/
5. https://en.wikipedia.org/wiki/SQL

MAPPING WITH PROGRAM OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	3	3		2		2	3	2	2	3	3
CO2	3	3		3	3			2		3	3		2		2
CO3	3		2	3	3			2		3	3	3	2		2
CO4	3	3	3	3	3			2		3	3	3	2		2
CO5	3		3	3	3			3		2	3	2	2		3

S-Strong(3) **M-Medium(2)** **L-Low(1)**

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS)

SUNDARAKKOTTAI, MANNARGUDI-614016.

(For the Candidates admitted in the academic year 2025–2026)

DEPARTMENT OF COMPUTER APPLICATIONS

Semester: IV Allied Course IV (b) – Introduction to Data Science and Lab

Ins. Hrs./Week: 3 **Course Credit: 3** **Course Code:U25ACA404B**

(Theory -60 Marks UE: 45 Marks IA:15 Marks)

Unit I: Introduction

Introduction: Benefits and uses–Facts of data–Data science process–Bigdata ecosystem and data science -The Data science process: Overview–research goals-retrieving data- transformation–Exploratory Data Analysis–Model building.

Unit II: Algorithms

Algorithms: Machine learning algorithms–Modeling process–Types –Supervised–Unsupervised-Semi-supervised.

Unit III: Hadoop

Introduction to Hadoop: Hadoop framework–Spark–replacing MapReduce–NoSQL–ACID–CAP–BASE–types-Case Study: Prediction of Disease-Setting research goals-Data retrieval–preparation-exploration-Disease profiling- presentation and automation.

******

(Practical -40 Marks UE:30 Marks IA:10 Marks)

Unit IV:

1. Installing Rand Packages in R.
2. Program and Data types in R.
3. Built-in function in R.
4. Creating and manipulating a vector.
5. Creating and Manipulating a Matrix

Unit – V:

6. Creating and Operations on Factors.
7. Operations on Data frames.
8. Operations on List.
9. Comparison of Matrix and Vector.
10. Programs on If Else Statement.

Course Outcomes

Upon the completion of the course, the students will able to

1. Understand the basic sin Data Science and Bigdata.
2. Understand overview and building process in Data Science.
3. Understand various Algorithms in Data Science.
4. Understand Hadoop Framework in Data Science.
5. Case study in Data Science.

Text Books

1. DavyCielen, ArnoD.B.Meysman,MohamedAli,—Introducing Data Science‖, manningpublications2016

Reference Books :

1. Roger Peng,—The Art of Data Science‖,lulu.com2016.
2. MurtazaHaider,—Getting Started with Data Science–Making Sense of Data with Analytics‖,IBMpress,E-book.
3. DavyCielen,ArnoD.B.Meysman,MohamedAli,—Introducing Data Science: Big Data,Machine Learning, and More, Using PythonTools‖,Dream tech Press 2016.
4. AnnalynNg,KennethSoo,—Numsense!Data Science for the Layman: No Math Added‖,2017,1stEdition.
5. CathyO'Neil,RachelSchutt,—Doing Data Science Straight Talk from the Frontline‖, O'ReillyMedia2013.

E-RESOURCES

1. https://www.w3schools.com/datascience/
2. https://en.wikipedia.org/wiki/Data_science
3. http://www.cmap.polytechnique.fr/~lepennec/en/post/references/refs/
4. https://www.w3schools.com/r/r_intro.asp
5. https://cran.r-project.org/doc/manuals/R-intro.pdf

Mapping with Programme Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	**3**	**3**	**2**	**3**	**3**	**3**		**2**		**2**	**3**	**2**	**2**	**3**	**3**
CO2	**3**	**3**		**3**	**3**			**2**		**3**	**3**		**2**		**2**
CO3	**3**		**2**	**3**	**3**			**2**		**3**	**3**	**3**	**2**		**2**
CO4	**3**	**3**	**3**	**3**	**3**			**2**		**3**	**3**	**3**	**2**		**2**
CO5	**3**		**3**	**3**	**3**			**3**		**2**	**3**	**2**	**2**		**3**

S-Strong-3 M-Medium-2 L-Low-1