

**RATHNAVEL SUBRAMANIAM COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)**

SULUR, COIMBATORE-641402

SCHOOL OF COMPUTER STUDIES

B.Sc. INFORMATION TECHNOLOGY



Syllabus effective for the students admitted during the academic

Year 2019 Batch onwards

(2019-2022)

**RATHNAVEL SUBRAMANIAM COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS), SULUR, COIMBATORE – 641 402**

SCHOOL OF COMPUTER STUDIES (UG)

B.Sc. Information Technology

PROGRAMME OUTCOMES (POs):

PO1	Graduates can have strong fundamentals in their specific discipline along with DIGITAL STRATEGIC knowledge.
PO2	To increase student's ability to communicate effectively with the community /society in verbal /written courage for such as to give or receive clear instruction.
PO3	To enhance their ability to understand and identify the professional and ethical responsibilities.
PO4	To enrich their personality and character development

PROGRAMME SPECIFIC OUTCOMES: (PSOs)

On the completion of B.Sc.(IT) Degree the Graduates will be competently able

PSO1	To perform the Job Roles such as Software Developer, Software Engineer, Associate Developer and AWS Solution Architect.
PSO2	To perform computing in multi-tenant Computational Architecture.
PSO3	To maintain Cloud computing ecosystem in a public or hybrid cloud facility.
PSO4	To demonstrate the skill sets of JAVA, Python, Design and Analysis of Algorithms, MongoDB, RDBMS,LINUX Operating System, Networks and Agile Software Engineer

GRADUATE ATTRIBUTES

- DISCIPLINE KNOWLEDGE
- PROBLEM ANALYSIS
- CRITICAL THINKING
- MODERN TOOLS USAGE
- SOFT SKILLS
- SELF LEARNING
- LIFE LONG LEARNING
- INDIVIDUAL & TEAM WORK
- PROJECT MANAGEMENT & FINANCE

RATHNAVEL SUBRAMANIAM COLLEGE OF ARTS & SCIENCE

(Autonomous)

Affiliated to Bharathiar University, Coimbatore – 641 402

SCHEME OF EXAMINATION – CBCS PATTERN

PROGRAMME: B.Sc. Information Technology
(Effective from the academic year 2019-20)

Credits & Marks Distribution

Sl. No.	Course Type	Number of Courses	Credits	Marks	Total Credits
1	Multi Indian/ International Languages	2	4	200	8
2	Ability Enhancement Compulsory Courses – I & II : Group-I (English)	2	4	200	8
3	Ability Enhancement Compulsory Courses – II & IV: Group-II	2	1+3	200	4
4	Discipline Specific Courses	12	6	1200	72
5	Discipline Specific Elective Courses	4+1	6	500	30
6	Extra Disciplinary Course (EDC)	1	6	100	6
7	Skill Enhancement Courses	2 + 1	4	200	8
8	ALCTA– e-Learning in MOOC platform	1	4*	Pass	4*
9	Non Credit Courses-Group I	2	-	Grade	-
10	Non Credit Courses – Group II	6	-	Pass	-
11	Non Credit Courses – Group III	4	-	Completed	-
Total				2600	136 + 4*

Multi-Indian/ International Languages								
Course	Course Name	L	T	P	CIA	SEE	Total	Credits
Two courses - Any one group								
Group I								
MIL-I	Tamil-I	6	-	-	25	75	100	4
MIL-II	Tamil-II	6	-	-	25	75	100	4
Group II								
MIL-I	Hindi-I	6	-	-	25	75	100	4
MIL-II	Hindi-II	6	-	-	25	75	100	4
Group III								
MIL-I	Malayalam-I	6	-	-	25	75	100	4
MIL-II	Malayalam-II	6	-	-	25	75	100	4
Group IV								
MIL-I	French-I	6	-	-	25	75	100	4
MIL-II	French-II	6	-	-	25	75	100	4
Group V								
MIL-I	Arabic-I	6	-	-	25	75	100	4
MIL-II	Arabic-II	6	-	-	25	75	100	4
Total							200	8

Ability Enhancement Compulsory Courses - Group I : (I & II Sem)								
AECC – G1-I	English-I(Grammar and Usage)	6	-	-	25	75	100	4
AECC – G1-II	English-II(Communicative English)	6	-	-	25	75	100	4
Total							200	8

Ability Enhancement Compulsory Courses - Group II : (II & IV Sem)								
AECC – G2-I	Environmental Studies	1	-	-	100	-	100	1
AECC – G2-II	Aptitude	3	-	-	100	-	100	3
Total							200	4

Discipline Specific Courses								
DSC-I	Java Programming	4	-	4	25 40	75 60	100	6
DSC-II	Mathematics For Computer Science -I	5	1	-	25	75	100	6
DSC-III	Cloud Practitioning	4	-	4	25 40	75 60	100	6
DSC-IV	Mathematics For Computer Science –II	5	1	-	25	75	100	6
DSC-V	Relational Database Management System	4	-	4	25 40	75 60	100	6
DSC-VI	Fundamentals of Cloud Computing	4	-	4	25 40	75 60	100	6
DSC-VII	Data Structures & Algorithms	4	-	4	25 40	75 60	100	6
DSC-VIII	Virtual Computing	4	-	4	25 40	75 60	100	6
DSC-IX	No SQL Database	4	-	4	25 40	75 60	100	6
DSC-X	Serverless Computing	4	-	4	25 40	75 60	100	6
DSC-XI	Operating Systems	4	-	4	25 40	75 60	100	6
DSC - XII	Python Programming	4	-	4	25 40	75 60	100	6
Total							1200	72

Discipline Specific Elective Courses I : (III Sem)								
Course	Course Name	L	T	P	CIA	SEE	Total	Credits
One course –From the group								
DSE-I	Computer Networks	5	1	-	25	75	100	6
DSE-I	Ethernet LAN & V-LAN	5	1	-	25	75	100	6
Total							100	6

Discipline Specific Elective Courses II : (IV Sem)								
Course	Course Name	L	T	P	CIA	SEE	Total	Credits
One course–From the group								
DSE-II	Agile Software Engineering	5	1	-	25	75	100	6
DSE-II	Implementing IPV4 with VLISM	5	1	-	25	75	100	6
Total							100	6

Discipline Specific Elective Courses III : (V Sem)								
Course	Course Name	L	T	P	CIA	SEE	Total	Credits
One course –From the group								
DSE-III	Data Analysis using Excel	5	1	-	25	75	100	6
DSE-III	Cyber Security-I	5	1	-	25	75	100	6
DSE-III	Android Programming - I	5	1	-	25	75	100	6
Total							100	6

Discipline Specific Elective Courses IV : (VI Sem)								
Course	Course Name	L	T	P	CIA	SEE	Total	Credits
One course – From the group								
DSE-IV	Data Visualization using Excel	5	1	-	25	75	100	6
DSE-IV	Cyber Security-II	5	1	-	25	75	100	6
DSE-IV	Android Programming - II	5	1	-	25	75	100	6
Total							100	6

Discipline Specific Elective Courses V: (VI Sem)								
Course	Course Name	L	T	P	CIA	SEE	Total	Credits
DSE-V	Elective-V-Project & Viva Voce	6	-	-	40	60	100	6
Total							100	6

Extra Disciplinary Course : (EDC -V Sem)								
Any one Course from the following								
EDC	Commercial Correspondence	5	1	-	25	75	100	6
EDC	Entrepreneurship	5	1	-	25	75	100	6
EDC	Project Management	5	1	-	25	75	100	6
EDC	Insurance and Risk Management	5	1	-	25	75	100	6
EDC	Global Financial Markets	5	1	-	25	75	100	6
EDC	E-Commerce	5	1	-	25	75	100	6
EDC	Responsive Web Design	5	1	-	25	75	100	6
EDC	Business Analytics	5	1	-	25	75	100	6
EDC	Cloud Practitioning	5	1	-	25	75	100	6
EDC	Hospitality Management	5	1	-	25	75	100	6
EDC	Fundamentals of Digital Computers	5	1	-	25	75	100	6
EDC	Test for Reasoning & Quantitative Aptitude	5	1	-	25	75	100	6
EDC	Health Management	5	1	-	25	75	100	6
EDC	Forensic Science	5	1	-	25	75	100	6
EDC	Microbes – Health & Disease	5	1	-	25	75	100	6
EDC	Health & Life Style Disorders	5	1	-	25	75	100	6
EDC	Indian Tax System	5	1	-	25	75	100	6
EDC	Digital Marketing	5	1	-	25	75	100	6
Total							100	6

Skill Enhancement Courses-Group I : (III & IV Sem)								
SEC- G1-I	Communicative Skills-I	2	-	-	50	-	50	2
SEC- G1-II	Communicative Skills-II	2	-	-	50	-	50	2
Total							100	4

Skill Enhancement Courses- Group II : (V Sem)								
Course	Course Name	L	T	P	CIA	SEE	Total	Credits
Any one group								
Group A								
SEC- G2-A-I	Placement - College to Corporate I	2	-	-	50	-	50	2
SEC- G2-A-II	Placement - College to Corporate II	2	-	-	50	-	50	2
Group B								
SEC – G2-B	e-Learning in MOOC Platform	4	-	-	100	-	100	4
Total							100	4

Non-Credit Courses – Group I : (III & IV Sem)			
NCC-G1-I	Career Skills-I	RVS Training Academy	Grade
NCC-G1-II	Career Skills-II	RVS Training Academy	Grade

Non-Credit Courses – Group II : COP (I - VI Sem)			
NCC-G2-I	2D Design Concepts Part-I	B.Sc.(IT)	Pass
NCC-G2-II	2D Design Concepts Part-II	B.Sc.(IT)	Pass
NCC-G2-III	3D Fundamentals Part-I	B.Sc.(IT)	Pass
NCC-G2-IV	3D Fundamentals Part-II	B.Sc.(IT)	Pass
NCC-G2-V	3D Industry Workflow Part-I	B.Sc.(IT)	Pass
NCC-G2-VI	3D Industry Workflow Part-II	B.Sc.(IT)	Pass

Non-Credit Courses – Group III :(I – IV Sem)			
Any one Course			
NCC-G3	National Service Scheme	NSS	Good/ Satisfactory
	National Cadet Corps	NCC	Good/ Satisfactory
	Sports	Physical Education	Good/ Satisfactory
	Literacy & Cultural Club	Language Department	Good/ Satisfactory
	Youth Red Cross /Red Ribbon Club	YRC	Good/ Satisfactory
	Fine Arts Club	Language Department	Good/ Satisfactory

Extra Optional Credit Course (ALCTA-Advanced Learners Course in Thrust Areas)			
Any one Course with 4 extra credits			
ALCTA	e-Learning in MOOC Platform	4 CREDITS	Completion

**RATHNAVEL SUBRAMANIAM COLLEGE OF ARTS & SCIENCE
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SULUR, COIMBATORE – 641 402**

**SCHEME OF EXAMINATIONS
B.Sc. (Information Technology)
2019-2020 BATCH**

Semester	Course Opted	Course Name	D	L	T	P	CIA	SEE	Marks	Credits
I										
	MIL-I	Tamil-I/ Hindi-I/ Malayalam-I/French-I/ Arabic-I	3	6	-	-	25	75	100	4
	AECC-G1-I	English-I(Grammar and Usage)	3	6	-	-	25	75	100	4
	DSC-I	Java Programming	$\frac{3}{3}$	4	-	4	$\frac{25}{40}$	$\frac{75}{60}$	100	6
	DSC-II	Mathematics for Computer Science-I	3	5	1	-	25	75	100	6
	NCC-G3	NCC/NSS/ SPORTS/CULTURALS	-	1	-	-	-	-	-	-
	LIB	Library	-	1	-	-	-	-	-	-
	Total				28				400	20
II										
	MIL-II	Tamil-II/ Hindi-II/ Malayalam-II/French-II/ Arabic-II	3	6	-	-	25	75	100	4
	AECC-G1-II	English-II(Communicative English)	3	6	-	-	25	75	100	4
	DSC-III	Cloud Practitioning	$\frac{3}{3}$	4	-	4	$\frac{25}{40}$	$\frac{75}{60}$	100	6
	DSC-IV	Mathematics for Computer Science –II	3	5	1	-	25	75	100	6
	AECC-G2-I	Environmental Studies	3	1	-	-	100	-	100	1
	NCC-G3	NCC/NSS/ SPORTS/CULTURALS	-	1	-	-	-	-	-	-
					28			500	21	

Semester	Course Opted	Course Name	D	L	T	P	CIA	SEE	Marks	Credits
III	DSC-V	Relational Database Management System	3	4	-	4	25	75	100	6
			3				40	60		
	DSC-VI	Fundamentals of Cloud Computing	3	4	-	4	25	75	100	6
			3				40	60		
	DSE-I	Elective-I	3	5	1	-	25	75	100	6
	SEC-G1-I	Communicative Skills-I	3	2	-	-	50	-	50	2
	NCC-G1-I	Career Skills-I	3	2	-	-	Grade			
	NCC-G3	NCC/NSS/ SPORTS/CULTURALS	-	1	-	-	-	-	-	-
	LIB	Library	-	1	-	-	-	-	-	-
Total										
					28				350	20
IV	DSC-VII	Data structures & Algorithms	3	4	-	4	25	75	100	6
			3				40	60		
	DSC-VIII	Virtual Computing	3	4	-	4	25	75	100	6
			3				40	60		
	DSE-II	Elective-II	3	5	1	-	25	75	100	6
	SEC-G1-II	Communicative Skills-II	3	2	-	-	50	-	50	2
	NCC-G1-II	Career Skills-II	3	2	-	-	Grade			
	AECC-G2-II	Aptitude	3	3	-	-	100	-	100	3
	NCC-G3	NCC/NSS/ SPORTS/CULTURALS	-	1	-	-	-	-	-	-
Total										
					30				450	23

Semester	Course Opted	Course Name	D	L	T	P	CIA	SEE	Marks	Credits	
V											
	DSC-IX	No SQL Databases	3 3	4	-	4	25 40	75 60	100	6	
	DSC-X	Serverless Computing	3 3	4	-	4	25 40	75 60	100	6	
	DSE-III	Elective-III	3	5	1	-	25	75	100	6	
	EDC	Elective	3	5	1	-	25	75	100	6	
	ANY ONE GROUP										
	Group A										
	SEC-G2-A-I	Placement - College to Corporate I	3	2	-	-	-	50	-	50	2
	SEC-G2-A-II	Placement - College to Corporate II		2	-	-	-	50	-	50	2
	Group B										
	SEC – G2-B	e-Learning in MOOC Platform	4	-	-	-	100	-	100	4	SEC – G2-B
	NSS-G3	NCC/NSS/SPORTS/CULTURALS	-	-	-	-	-	GOOD / SATISFACTORY			
	Total					32				500	28
VI											
DSC-XI	Operating Systems	3 3	4	-	4	25 40	75 60	100	6		
DSC-XII	Python Programming	3 3	4	-	4	25 40	75 60	100	6		
DSE-IV	Elective-IV	3	5	1	-	25	75	100	6		
DSE-V	Elective-V-Project & Viva Voce	3	6	-	-	40	60	100	6		
ALCTA	e-Learning in MOOC Platform	-	-	-	-	-	-	-	-	4*	
Total					28				400	24	
Total									2600	140	

*- Extra Optional Credit Course (ALCTA)

Non-Credit Courses – Group II (COP)

Semester	Course Opted	Course Name	D	L	T	P	CIA	SEE	Marks
I	NCC-G2-I	2D Design Concepts Part-I	3	1	-	-	25	75	100
II	NCC-G2-II	2D Design Concepts Part-II	3	-	-	1	25	75	100
III	NCC-G2-III	3D Fundamentals Part-I	3	1	-	-	25	75	100
IV	NCC-G2-IV	3D Fundamentals Part-II	3	-	-	1	25	75	100
V	NCC-G2-V	3D Industry Workflow Part-I	3	1	-	-	25	75	100
VI	NCC-G2-VI	3D Industry Workflow Part-II	3	-	-	1	25	75	100
Total									600

DSE-I-Discipline Specific Elective Courses I: (III Semester)

1. Computer Networks
2. Ethernet LAN & V-LAN

DSE-II- Discipline Specific Elective Courses II: (IV Semester)

1. Agile Software Engineering
2. Implementing IPV4 with VLSM

DSE-III-Discipline Specific Elective Courses III: (V Semester)

1. Data Visualization using Excel - I
2. Cyber Security-I
3. Android Programming – I

DSE-IV- Discipline Specific Elective Courses IV: (VI Semester)

1. Data Visualization using Excel - II
2. Cyber Security-II
3. Android Programming - II

DSE-V- Discipline Specific Elective Courses V: (VI Semester)

1. Project & Viva Voce

Course Outcomes

Semester	Name of the Course	Course Outcomes
Semester I	JAVA PROGRAMMING	<ul style="list-style-type: none"> • Understand the Fundamentals of Programming, data types, Classes and IDE • Demonstrate the Control Structures, Conditionals and Loops. • Employ exception handling, validate and test an application • Demonstrate classes and members of class • Design programs that have Inheritance and Interfaces • Employ packages, arrays and String • Compute programs that use exception handling • Write programs that uses files
Semester II	CLOUD PRACTITIONING	<ul style="list-style-type: none"> • Understanding cloud and early examples of cloud • Understanding cloud services in business perspectives • Understanding cloud services in Technical perspectives. • Understanding the importance of cloud and Risk management of Cloud • Understanding the basic operations of cloud computing.
Semester III	RELATIONAL DATABASE MANAGEMENT SYSTEM	<ul style="list-style-type: none"> • Describe the basic concepts of data and database. • Explore the use of keys and functional dependencies • Understand the structure and use of Structured Query Language and Create relation with constraints • Implement the data manipulation operations with aggregation, group by and joins • Describe the concepts of normalization and apply it into real time requirements. • Understand the concept of ER modeling, challenges of ER modeling and apply to real time requirements.
	COMPUTER NETWORKS	<ul style="list-style-type: none"> • Understanding and analysis of the layered approach of networking with concepts of twisted pair cabling usage.

		<ul style="list-style-type: none"> • Understanding and implementing the requirements and effects of configuring proper switch functions • Understanding how to define and implement routers with basic routing phenomenon • Understanding how to configure dynamic IP address allocating process. • Understanding and implementing address translations with Access Control List mechanics.
	FUNDAMENTALS OF CLOUD COMPUTING	<ul style="list-style-type: none"> • Understanding and accessing the cloud computing phenomenon and service delivery models • Understanding the service delivery models • Understanding and configuring object storage and backups in AWS. • Understanding and configuring EC2 computing instances. • Understanding the usage of block storages
Semester IV	DATA STRUCTURES AND ALGORITHMS	<ul style="list-style-type: none"> • Understand and Apply the basic concepts of Data Structures, Recursion and Arrays. • Understand the time complexity of various data structures • Implement Linked list using python • Demonstrate the stack ADT and Queue ADT using linked list, array data structure. • Understand and Demonstrate the Searching and Sorting techniques. • Describe and Demonstrate Binary Search Tree and Graphs • Understand Spanning Trees, Greedy Algorithms, Weighted Graphs and analyze the time complexity
	AGILE SOFTWARE ENGINEERING	<ul style="list-style-type: none"> • Generalize the principles and values of Agile • Determine the planning activities to minimize the probability of failure • Discuss about frequent reviews of work products • Express the ground rules and internal process in order to strengthen team members • Estimate the project plan based on team learning • Use appropriate techniques to solve risk management

	VIRTUAL COMPUTING	<ul style="list-style-type: none"> • Understanding and implementation of VPC with Elastic IP address schemes • Understanding and configuring access prevention techniques using ACLs inside AWS environment. • Understanding and implementing the load balancing mechanics inside AWS • Understanding and configuring IAM authentication principles with scaling factors. • Understanding and implementation of account authentication and related key factors inside AWS
Semester V	NOSQL DATABASE	<ul style="list-style-type: none"> • Discuss the basic concepts of MongoDB and Databases • Explain the concepts of MongoDB architecture • Illustrate MongoDB CRUD operation using insert, find, update and delete operation • Execute Text search using MongoDB • Implement Replication using Replica set • Execute Sharding using shard and non-shard collection
	SERVERLESS COMPUTING	<ul style="list-style-type: none"> • Understanding and implementation of centralized database operations inside AWS. • Understanding and implementation of RDS. • Understanding and implementation of Reshift and Redshift load balancing inside AWS. • Understanding and configuring DynamoDB inside AWS. • Implementation of SQS and centralized database operations inside AWS.
	CLOUD PRACTITIONING	<ul style="list-style-type: none"> • Understanding cloud and early examples of cloud • Understanding cloud services in business perspectives • Understanding cloud services in Technical perspectives. • Understanding the importance of cloud and Risk management of Cloud • Understanding the basic operations of cloud computing.
	CYBER SECURITY - I	<ul style="list-style-type: none"> • Define cybersecurity and the responsibilities of cybersecurity professionals, Identify types of hackers and their motivations and Explain how

		<p>vulnerabilities are identified & addressed</p> <ul style="list-style-type: none"> • Use the CIA and AAA models to explain cybersecurity activities and Explain the balance between security & availability • Familiarize Basic cryptography concepts • Describe how information finds its way through the internet and Parse IP & MAC addresses • Describe how data travels within a network or an Autonomous System and how systems administrators manage IP addresses • Describe different types of firewalls and how they work, List different categories of malicious software and Describe different types of social engineering attacks
	DATA ANALYSIS USING EXCEL	<ul style="list-style-type: none"> • Understand and Apply the concepts of basic Excel functions for data formatting, representation and analysis. • Demonstrate the role of various types of charts in Business Applications using Excel • Understand the applications of Excel in Business Management. • Solve the problems in the Business Management domain using Excel. • Analyze and represent the data effectively in Financial Building and Planning. • Understand the analysis of databases and Apply the concepts for Evaluation and reporting using excel
	ANDROID PROGRAMMING-I	<ul style="list-style-type: none"> • Explain and illustrate the concepts of Variables , Constants, Control Statements, Exceptions and Classes • Define and apply Inheritance, Interfaces, and Arrays • Define and illustrate user interface widgets and layouts • Describe the importance of android and demonstrate android app eclipse • Perform Interface functions in Android • Apply Java code with events for Android App • Demonstrate to test and debug an android app
	OPERATING SYSTEMS	<ul style="list-style-type: none"> • Understand the components, uses of Operating system and types of operating systems based on processing method.

Semester-VI		<ul style="list-style-type: none"> • Identify memory management strategies. • Understanding the concept of Virtual memory • Understanding the concept of Virtual memory • Determine the Scheduling algorithm using FCFS , SJF , and Round robin techniques. • Understanding and analyzing file operations with search activity. • Understanding and implementation of process management and partitioning.
	CYBER SECURITY - II	<ul style="list-style-type: none"> • Describe packet sniffing and how it's used, Use Wireshark to view network activity and Interpret through Wireshark • Explain the differences between three types of password cracking attacks, Describe how a rainbow table is generated and Explain how salt is used to impede password attacks • Understand how systems initiate communication through TCP Three-Way Handshake, Explain why port scanning is used and how it works and Describe the information that can be collected through different types of port scans • Define key terms related to network attacks & intrusions and Explain how recent widespread attacks were able to compromise large numbers of users • Use basic hacking tools to find and exploit vulnerabilities • Describe Access Control Lists (ACLs), how they work and Correctly configure standard & extended ACLs
	DATA VISUALIZAION USING EXCEL	<ul style="list-style-type: none"> • Demonstrate the advanced Excel functions Named Ranges, Circular Referencing, Lookup, and Array Formula. • Creation of Dynamic Charts using Advanced Charting techniques • Preparing Dashboards for effective data representation • Understand and Apply the basic Macro functions in Excel • Demonstrate the basic of Statistics Functions and Analysis in Excel • Applying the concepts of excel functions, macros, dashboards and regression in Projects.

	<p style="text-align: center;">ANDROID PROGRAMMING II</p>	<ul style="list-style-type: none"> • Illustrate to Work with Themes , Styles, Menus and Preferences • Extend work with Fragments, Threads, Files, Adapters and intents. • Demonstrate work with Services and Notifications • Perform techniques to work with SQLite databases. • Explain and apply Tabs and Custom Adapters • Creation and working with App widgets and deploy an App.
	<p style="text-align: center;">INTRODUCTION TO COMPUTING USING PYTHON</p>	<ul style="list-style-type: none"> • Understand the Fundamentals of Computing, Programming and Debugging • Demonstrate the Procedural Programming, Variables, Logical and Mathematical Operators • Employ the Control Structures, Conditionals and Loops. • Demonstrate Functions and Error Handling • Understand and Apply Data Structures, Strings and List • Implement File I/O and Dictionaries • Design programs that uses Object-Oriented Concepts • Write programs that uses algorithms