

RATHNAVEL SUBRAMANIAM COLLEGE OF ARTS AND SCIENCE

SCHOOL OF COMPUTER STUDIES

BACHELOR OF COMPUTER APPLICATIONS (BCA)

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)

Upon completion of Bachelor of Computer Applications Degree, STUDENTS are able to achieve the following outcomes.

PSO1	To perform the Job Roles such as Software Developer, Software Engineer, Associate Developer and MERNStack Developer/ Fullstack App Developer.
PSO2	To acquire the skill sets of Static web page development (HTML, CSS, Mediaqueryand JavaScript).
PSO3	To acquaint skill sets of Dynamic web page development (NodeJS, ExpressJS and MongoDB) .
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: BACHELOR OF COMPUTER APPLICATIONS**

(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 & IVSem)								
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	75	100	6
					40	60		
DSC-II	Mathematics for Computer Science -II	5	1	-	25	75	100	6
DSC- III	Responsive Web Design	4	-	4	25	75	100	6
					40	60		
DSC- IV	Mathematics for Computer Science -II	5	1	-	25	75	100	6
DSC –V	Relational Database Management System	4		4	25	75	100	6
					40	60		
DSC- VI	JavaScript and JQuery	4	-	4	25	75	100	6
DSC –VII	Data Structures & Algorithms	4		4	40	60	100	6
					25	75		
DSC –VIII	React Js	4		4	40	60	100	6
					25	75		
DSC –IX	No SQL Databases	4	-	4	40	60	100	6
					25	75		
DSC – X	NodeJS	4	-	4	40	60	100	6
					25	75		
DSC-XI	Python Programming	4	-	4	40	60	100	6
					25	75		
DSC-XII	Operating Systems	4	-	4	40	60	100	6
					25	75		
							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	AngularJS	5	1	-	25	75	100	6
Total							100	6

Discipline Specific Elective Courses II : (IVSem)								
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	PHP & MySQL	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 II	5	1	-	25	75	100	6
DSE-III	Android Programming II	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 Basics	5	1	-	25	75	100	6
EDC	Hospitality Management	5	1	-	25	75	100	6
EDC	Excel	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	BCA	Pass
NCC-G2-II	2D Design Concepts Part II	BCA	Pass
NCC-G2-III	3D Fundamentals Part I	BCA	Pass
NCC-G2-IV	3D Fundamentals Part II	BCA	Pass
NCC-G2-V	3D Industry Workflow Part I	BCA	Pass
NCC-G2-VI	3D Industry Workflow Part II	BCA	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

SCHEME OF EXAMINATION
BACHELOR OF COMPUTER APPLICATIONS
2019-2022 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	3 3	4	-	4	25 40	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						2 8		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		Responsive Web Design	3 3	4	-	4	25 40	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	-	-	-	-	-	-	
TOTAL						2 8		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		
	DSE-I	Elective - I	3	5	1	-	25	75	100	6
	DSC –VI	JavaScript and JQuery	3	4	-	4	25	75	100	6
			3				40	60		
	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		
	DSE-II	Elective - II	3	5	1	-	25	75	100	6
	DSC-VIII	React JS	3	4	-	4	25	75	100	6
			3				40	60		
	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	4	-	4	25	75	100	6	
			3				40	60			
	DSC – X	NodeJS	3	4	-	4	25	75	100	6	
			3				40	60			
	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	3	4	-	-	-	100	-	100	4
	NCC-G3	NSS/NCC/SPORTS/CULTURALS	-	-	-	-	-	GOOD/SATISFACTORY			
	Total						32			500	28
VI											
	DSC - XII	Python Programming	3	4		4	25	75	100	6	
			3				40	60			
	DSC – XIII	Operating Systems	3	5	1	-	25	75	100	6	
	DSE-IV	Elective - IV	3	4	-	4	25	75	100	6	
			3				40	60			
	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 Course (ALCTA)

Non Credit Course – 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. Angular JS

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

1. Agile Software Engineering
2. PHP & MySQL

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

1. Data Analysis using Excel
2. Cyber Security I
3. Android Programming I

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

1. Data Visualization using Excel
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	Responsive Web Design	<ul style="list-style-type: none"> • Understand the basic concepts of WEB and HTML structure • Create Static Web page with List, Image, Links and Tables • Apply style to the static web page • Implement the layouts with form controls • Create Responsive grids, container with navigation • Implement Media query and make a complete UI for an Web Application
Semester III	Relational Data Base 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.
	Elective- I (Computer Networks)	<ul style="list-style-type: none"> • Understanding and analysis of the layered approach of networking with concepts of twisted pair cabling usage. • Understanding and implementing the requirements and effects of configuring proper switch functions • Understanding how to define and implement routers

		<p>with basic routing phenomenon</p> <ul style="list-style-type: none"> • Understanding how to configure dynamic IP address allocating process. • Understanding and implementing address translations with Access Control List mechanics
	JavaScript and JQuery	<ul style="list-style-type: none"> • Understand the basic concepts of web scripting • Develop programs by using operators, variable and functions • Develop programs using control structures and arrays • Understand and Access the Document Object Model Structure • Apply manipulation on DOM with JavaScript event listeners and higher order function • Understand and apply JQuery concepts into a static web page
Semester IV	Data Structures & 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
	Elective –II(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
	React JS	<ul style="list-style-type: none"> • Understand the base features of React JS • Apply style to the components and elements • Understand and apply the React component life cycle

		<ul style="list-style-type: none"> and React DOM to real time requirements • Implement routes and form validation • Understand and apply Redux concepts with Authentication • Implement Hooks into the Web Application
Semester V	No SQL Databases	<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
	NodeJS	<ul style="list-style-type: none"> • Understand the basic concepts of Node JS and NPM • Create Web application with Express JS • Create API and JSON to the static web application • Understand EJS and Implement Templates • Implement data manipulation using MongoDB • Implement Authentication using encryption, Session and Cookies.
	Elective-III(Data Visualization using Excel-I)	<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
	Elective-III (Cyber Security- I)	<ul style="list-style-type: none"> • Define cyber security and the responsibilities of cyber security professionals, Identify types of hackers and their motivations and Explain how vulnerabilities are identified & addressed • Use the CIA and AAA models to explain cyber security activities and Explain the balance between security & availability • Familiarize Basic cryptography concepts • Describe how information finds its way through the

		<p>internet and Parse IP & MAC addresses</p> <ul style="list-style-type: none"> • 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
	Elective-III (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
	EDC – Responsive Web design	<ul style="list-style-type: none"> • Understand the basic concepts of WEB and HTML structure • Create Static Web page with List, Image, Links and Tables • Apply style to the static web page • Implement the layouts with form controls • Create Responsive grids, container with navigation • Implement Media query and make a complete UI for an Web Application
Semester VI	Python Programming	<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
	Operating System	<ul style="list-style-type: none"> • Understand the components, uses of Operating system and types of operating systems based on processing method. • Identify memory management strategies. • Understanding the concept of Virtual memory

		<ul style="list-style-type: none"> • 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.
	Data Visualization using Excel-II	<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.
Semester VI	Python Programming	<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
	Operating System	<ul style="list-style-type: none"> • Understand the components, uses of Operating system and types of operating systems based on processing method. • Identify memory management strategies. • 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.
	Data Visualization using Excel-II	<ul style="list-style-type: none"> • Demonstrate the advanced Excel functions Named Ranges, Circular Referencing, Lookup, and Array Formula.

		<ul style="list-style-type: none"> • 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.
	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
	Android Programming-II	<ul style="list-style-type: none"> • Illustrate to work with Themes, Style, Menu 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.