

DAYANANDA SAGAR UNIVERSITY
KUDLU GATE HOSUR ROAD BENGALURU – 560 100,
KARNATAKA.

SCHOOL OF ENGINEERING



SCHEME & SYLLABUS
FOR
MASTER OF COMPUTER APPLICATIONS

(I, II, III & IV Semesters)

(With effect from 2022-23)

Colour codes	
Skill – Yellow.	
Employability – Blue	
Entrepreneurship - Pink	

SCHEME - MCA - 2021 - 22 ONWARDS

I Semester

#	PROGRAM CODE	COURSE CODE	COURSE TITLE	CR/AU	SCHEME OF TEACHING					PRE-REQUISITE	
					L	T	P	S/P	C	SEM	COURSE CODE
1	224	21MCA4101	DATA STRUCTURES	CR	3	-	-	-	3	*	***
2	224	21MCA4102	COMPUTER ARCHITECTURE AND MICROCONTROLLER	CR	3	-	2	-	4	*	***
3	224	21MCA4103	ADVANCED OPERATING SYSTEMS	CR	3	-	-	-	3	*	***
4	224	21MCA4104	ADVANCED SOFTWARE ENGINEERING AND TESTING	CR	3	-	2	-	4	*	***
5	224	21MCA4105	PROBABILITY & STATISTICS	CR	3	-	2	-	4	*	***
6	224	21MCA4106	DATA STRUCTURES LAB	CR	-	-	4	-	2	*	***
7	224	21MCA4107	ADVANCED OPERATING SYSTEM LAB	CR	-	-	4	-	2	*	***
					15	-	14	-	22		

CR – Credit, AU – Audit, L – Lecture, T – Tutorial, P – Practical, S/P – Seminar/Project, C – No. of Credits

Colour codes	
Skill – Yellow.	
Employability – Blue	
Entrepreneurship - Pink	

SCHEME - MCA - 2021 - 22 ONWARDS

II Semester

#	PROGRAM CODE	COURSE CODE	COURSE TITLE	CR/AU	SCHEME OF TEACHING					PRE-REQUISITE	
					L	T	P	S/P	C	SEM	COURSE CODE
1	224	21MCA4201	ADVANCED ALGORITHMS	CR	3	-	-	-	3	*	***
2	224	21MCA4202	JAVA PROGRAMMING	CR	3	-	-	-	3	*	***
3	224	21MCA4203	COMPUTER COMMUNICATION AND NETWORKS	CR	3	-	-	-	3	*	***
4	224	21MCA4204	DATABASE MANAGEMENT SYSTEMS	CR	3	-	-	-	3	*	***
5	224	21MCA4205	ADVANCED ALGORITHMS LAB	CR	-	-	4	-	2	*	***
6	224	21MCA4206	JAVA PROGRAMMING AND NETWORKS LAB	CR	-	-	4	-	2	*	***
7	224	21MCA4207	DATABASE MANAGEMENT SYSTEMS LAB	CR	-	-	4	-	2	*	***
8	224	21MCA4208	SUMMER INTERSHIPS	CR	-	-	4	-	2	*	***
9	224	21MCA42XX	DEPARTMENT ELECTIVE - I	CR	3	-	2	-	4	*	***
					15		18	-	24		

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#	COURSE CODE	DEPARTMENT ELECTIVE – I
1	21MCA4209	DATA ANALYTICS & VISUALIZATION
2	21MCA4210	VIRTUALIZATION & CLOUD COMPUTING
3	21MCA4211	FULL STACK DEVELOPMENT

III SEMESTER

#	PROGRAM CODE	COURSE CODE	COURSE TITLE	CR/AU	SCHEME OF TEACHING					PRE-REQUISITE	
					L	T	P	S/P	C	SEM	COURSE CODE
1	224	21MCA4301	AI AND MACHINE LEARNING	CR	03	-	-	-	03	*	***
2	224	21MCA4302	EMBEDDED SYSTEMS AND INTERNET OF THINGS	CR	03	-	-	-	03	*	***
3	224	21MCAXXXX	DEPARTMENT ELECTIVE -2	CR	03	-	02	-	04	*	***
4	224	21MCAXXXX	DEPARTMENT ELECTIVE -3	CR	03	-	02	-	04	*	***
5	224	21MCA4303	AI AND MACHINE LEARNING LAB USING PYTHON	CR	-	-	04	-	02	*	***
6	224	21MCA4304	EMBEDDED AND INTERNET OF THINGS LABORATORY	CR	--	--	04	-	02	*	***
7	224	21MCA4305	SOCIALLY RELEVANT PROJECT	CR	--	--	08	-	04	*	***
					12	-	20	-	22		

COURSE CODE	DEPARTMENT ELECTIVES II & III
21MCA4306	DISTRIBUTED COMPUTING (HADOOP AND SCALA)
21MCA4307	DATA MINING
21MCA4308	BUSINESS INTELLIGENCE TECHNOLOGY
21MCA4309	BIG DATA WITH R
21MCA4310	DATA SCIENCE
21MCA4311	CLOUD NETWORKING & SECURITY
21MCA4312	CLOUD STORAGE
21MCA4313	MOBILE APPLICATION DEVELOPMENT TECHNIQUES

IV SEMESTER

#	PROGRAM CODE	COURSE CODE	COURSE TITLE	CR/AU	SCHEME OF TEACHING					PRE-REQUISITE	
					L	T	P	S/P	C	SEM	COURSE CODE
1	224	21MCAXXXX	DEPARTMENT ELECTIVE -4	CR	03	-	02	-	04	*	***
2	224	21MCAXXXX	OPEN ELECTIVE -(MOOC)	CR	03	-	02	-	04	*	***
3	224	21MCAXXXX	OPEN ELECTIVE(MOOC)	CR	03	-	02	-	04	*	***
4	224	21MCA4404	DISSERTATION	CR	-	-	10	-	05	*	***
					09	-	16	-	17		

COURSE CODE	DEPARTMENT ELECTIVES IV
21MCA4401	INFORMATION SECURITY
21MCA4402	INTRODUCTION TO SOCIAL NETWORK ANALYSIS
21MCA4403	DEEP LEARNING
21MCA4405	BLOCK CHAIN TECHNOLOGY

COURSE CODE	LIST OF OPEN ELECTIVES
21MCA4406	BUSINESS DATA ANALYTICS
21MCA4407	INDUSTRIAL SAFETY
21MCA4408	OPERATIONS RESEARCH
21MCA4409	COST MANAGEMENT OF ENGINEERING PROJECTS
21MCA4410	COMPOSITE MATERIALS
21MCA4411	WASTE TO ENERGY

DAYANANDA SAGAR UNIVERSITY
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SCHOOL OF ENGINEERING



SCHEME & SYLLABUS
FOR
BACHELOR OF COMPUTER APPLICATIONS
(BCA)

(1-8 Semesters) Scheme

(With effect from 2022-23)

Dayananda Sagar University

School of Engineering

Kudlu Gate, Hosur Road, Bengaluru 560068

DEPARTMENT OF COMPUTER APPLICATIONS

SCHEME – BCA – 2022 -23 ONWARDS

I SEM

SL	PROGRAM CODE	COURSE CODE	COURSE TITLE	CR / AU	SCHEME OF TEACHING					PREREQUISITE	
					L	T	P	S / P	C	SEM	COURSE CODE
1	106	22CA1101	MATHEMATICS-I	CR	03	01	--	--	04	***	***
2	106	22CA1102	FUNDAMENTALS OF PROGRAMMING	CR	03	--	--	--	03	***	***
3	106	22CA1103	COMPUTER ORGANIZATION – I	CR	03	--	--	--	03	***	***
4	106	22CA1104	WEB PROGRAMMING	CR	03	--	02	--	04	***	***
5	106	22CA1105	ACCOUNTING AND FINANCIAL MANAGEMENT	CR	03	--	02	--	04	***	***
6	106	22CA1106	ENGLISH IN PRACTICE	CR	02	--	02	--	03	***	***
7	106	22CA1107	PROGRAMMING LAB	CR	-	-	02	--	01	***	***
8	106	22CA1108	COMPUTER ORGANIZATION LAB	CR	-	-	02	--	01	***	***
					17	01	10	--	23		
9	106	22AU0004	CONSTITUTION OF INDIA AND PROFESSIONAL ETHICS	AU	02	--	--	--	--	***	***

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DEPARTMENT OF COMPUTER APPLICATIONS

SCHEME – BCA – 2022 -23 ONWARDS

II SEM

SL	PROGRAM CODE	COURSE CODE	COURSE TITLE	CR / AU	SCHEME OF TEACHING					PREREQUISITE	
					L	T	P	S / P	C	SEM	COURSE CODE
1	106	22CA1201	MATHEMATICS-II	CR	03	01	--	--	04	***	***
2	106	22CA1202	OBJECT ORIENTED PROGRAMMING USING JAVA	CR	03	--	--	--	03	***	***
3	106	22CA1203	DATA STRUCTURES	CR	03	--	--	--	03	***	***
4	106	22CA1204	COMPUTER ORGANIZATION II	CR	03	--	--	--	03	***	***
5	106	22CA1205	TECHNICAL COMMUNICATIONS	CR	02	--	02	--	03	***	***
6	106	22CA1206	OOP LAB	CR	-	-	02	--	01	***	***
7	106	22CA1207	DATA STRUCTURES LAB	CR	-	-	02	--	01	***	***
8	106	22CA1208	COMPUTER ORGANIZATION LAB	CR	-	-	02	--	01	***	***
9	106	22CA1209	MINI PROJECT-WEB PROGRAMMING ORIENTED		--	--	--	04	02		
					14	01	08	04	21		
10	106	22AU0008	ENVIRONMENT AND PUBLIC HEALTH	AU	02	--	--	--	--	***	***

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The students who wish to quit after successfully completing the 1st Year will be issued with a “Certificate in Web programming”

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DEPARTMENT OF COMPUTER APPLICATIONS

SCHEME – BCA – 2022 -23 ONWARDS

III SEM

SL	PROGRAM CODE	COURSE CODE	COURSE TITLE	CR / AU	SCHEME OF TEACHING					PREREQUISITE	
					L	T	P	S /P	C	SEM	COURSE CODE
1	106	22CA2301	COMPUTER NETWORKS	CR	03	--	02	--	04	***	***
2	106	22CA2302	PYTHON PROGRAMMING	CR	03	--	--	--	03	***	***
3	106	22CA2303	DISCRETE MATHEMATICAL STRUCTURES	CR	03	01	--	--	04	***	***
4	106	22CA2304	NUMERICAL METHODS	CR	03	--	02	--	04	***	***
5	106	22CA2305	ANALYSIS AND DESIGN OF ALGORITHMS	CR	03	--	02	--	04	***	***
6	106	22CA2306	OPERATING SYSTEMS	CR	03	--	--	--	03	***	***
7	106	22CA2307	PYTHON PROGRAMMING LAB	CR	-	-	02	--	01	***	***
8	106	22CA2308	OPERATING SYSTEMS LAB	CR	-	-	02	--	01	***	***
9	106	22CA2309	SEMINAR	CR	-	-	-	02	01		
					18	01	10	02	25		
9	106	20AU0021	KANNADA KALI – II	AU	02	--	--	--	--	***	***
		20AU0025	KANNADA MANASU – II								

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DEPARTMENT OF COMPUTER APPLICATIONS

SCHEME – BCA – 2022 -23 ONWARDS

IV SEM

SL	PROGRAM CODE	COURSE CODE	COURSE TITLE	CR / AU	SCHEME OF TEACHING					PREREQUISITE	
					L	T	P	S /P	C	SE M	COURSE CODE
1	106	22CA2401	OBJECT ORIENTED ANALYSIS AND DESIGN	CR	03	--	02	--	04	***	***
2	106	22CA2402	INTERNET TECHNOLOGIES	CR	03	--	--	--	03	***	***
3	106	22CA2403	DATABASE SYSTEMS	CR	03	--	--	--	03	***	***
4	106	22CA2404	SOFTWARE ENGINEERING AND TESTING	CR	03	--	02	--	04	***	***
5	106	22CA24XX	PROFESSIONAL ELECTIVE – I	CR	02	01	02	--	04	***	***
6	106	22CA2405	INTERNET TECHNOLOGIES LAB	CR	-	-	02	--	01	***	***
7	106	22CA2406	DATABASE SYSTEMS LAB	CR	-	-	02	--	01	***	***
8	106	22CA2407	MINOR PROJECT	CR	-	-	--	04	02	***	***
					14	01	10	04	22		

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The students who wish to quit after successfully completing the 2nd Year will be awarded “Diploma in Computer Applications”

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DEPARTMENT OF COMPUTER APPLICATIONS

PROFESSIONAL ELECTIVE – I

SL	COURSE CODE	COURSE TITLE
1	22CA2408	SYSTEM ADMINISTRATION
2	22CA2409	IOT
3	22CA2410	C# AND DOT NET FRAMEWORK
4	22CA2411	COMPUTER GRAPHICS AND MULTIMEDIA

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DEPARTMENT OF COMPUTER APPLICATIONS

SCHEME – BCA – 2022 -23 ONWARDS

V SEM

SL	PROGRAM CODE	COURSE CODE	COURSE TITLE	CR / AU	SCHEME OF TEACHING					PREREQUISITE	
					L	T	P	S / P	C	SEM	COURSE CODE
1	106	22CA3501	INFORMATION AND NETWORK SECURITY	CR	02	01	--	--	03	***	***
2	106	22CA35XX	PROFESSIONAL ELECTIVE -II	CR	02	01	02	--	04	***	***
3	106	22CA35XX	PROFESSIONAL ELECTIVE – III	CR	02	01	02	--	04	***	***
4	106	22CA3502	INFORMATION AND NETWORK SECURITY LAB	CR	-	-	02	--	01	***	***
5	106	22CA3503	PROJECT STAGE I	CR	-	-	--	08	04	***	***
6	106	22CA3504	LIBERAL STUDIES 1		01				01		
					07	03	06	08	17		

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DEPARTMENT OF COMPUTER APPLICATIONS

PROFESSIONAL ELECTIVE – II & III

SL	COURSE CODE	COURSE TITLE
1	22CA3505	BIG DATA ANALYTICS USING HADOOP
2	22CA3506	DATABASE ADMINISTRATION
3	22CA3507	MOBILE PROGRAMMING
4	22CA3508	ADVANCED UNIX PROGRAMMING
5	22CA3509	LINUX SYSTEM ADMINISTRATION
6	22CA3510	WIRELESS AND MOBILE SECURITY
7	22CA3511	FULL STACK DEVELOPMENT
8	22CA3512	OPEN SOURCE DEVELOPMENT USING PHP AND MYSQL

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DEPARTMENT OF COMPUTER APPLICATIONS

SCHEME – BCA – 2022 -23 ONWARDS

VI SEM

SL	PROGRAM CODE	COURSE CODE	COURSE TITLE	CR / AU	SCHEME OF TEACHING					PREREQUISITE	
					L	T	P	S/P	C	SEM	COURSE CODE
1	106	22CA36XX	PROFESSIONAL ELECTIVE –IV	CR	02	01	02	--	04	***	***
2	106	22CA36XX	PROFESSIONAL ELECTIVE –V	CR	02	01	02	--	04	***	***
3	106	22CA3601	PROJECT STAGE II	CR	-	-	--	12	06	***	***
					04	02	04	12	14		

TOTAL CREDITS:122

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CIA – Continuous Internal Assessment

The students who wish to quit after successfully completing the 3rd year will be awarded the “Degree in Bachelor of Computer Applications”

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DEPARTMENT OF COMPUTER APPLICATIONS

PROFESSIONAL ELECTIVE – IV & V

SL	COURSE CODE	COURSE TITLE
1	22CA3602	ADVANCE DATABASE (NOSQL)
2	22CA3603	GAME PROGRAMMING
3	22CA3604	ETHICAL HACKING
4	22CA3605	WEB SECURITY
5	22CA3606	DATA SCIENCE
6	22CA3607	CLOUD COMPUTING
7	22CA3608	ANIMATIONS
8	22CA3609	DATA MINING AND KNOWLEDGE MANAGEMENT

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DEPARTMENT OF COMPUTER APPLICATIONS

SCHEME – BCA – 2022 -23 ONWARDS

VII SEM

SL	PROGRAM CODE	COURSE CODE	COURSE TITLE	CR / AU	SCHEME OF TEACHING					PREREQUISITE	
					L	T	P	S / P	C	SEM	COURSE CODE
1	106	22CA4701	COMPILER DESIGN	CR	02	01	--	--	03	***	***
2	106	22CA47XX	PROFESSIONAL ELECTIVE –VI	CR	02	01	02	--	04	***	***
3	106	22CA47XX	PROFESSIONAL ELECTIVE – VII	CR	02	01	02	--	04	***	***
4	106	22CA4702	COMPILER DESIGN LAB	CR	-	-	04	--	02	***	***
5	106	22CA4703	RESEARCH SEMINAR	CR	-	-	--	04	02	***	***
6	106	22CA4704	PROJECT II		-			08	04		
					06	03	08	12	19		

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DEPARTMENT OF COMPUTER APPLICATIONS

PROFESSIONAL ELECTIVE – VI & VII

SL	COURSE CODE	COURSE TITLE
1	22CA4705	DIGITAL IMAGE PROCESSING
2	22CA4706	ARTIFICIAL INTELLIGENCE
3	22CA4707	MACHINE LEARNING
4	22CA4708	SOFT COMPUTING
5	22CA4709	MANAGEMENT INFORMATION SYSTEM
6	22CA4710	CYBER LAW AND CRIME
7	22CA4711	OPERATIONAL RESEARCH
8	22CA4712	BIOINFORMATICS

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DEPARTMENT OF COMPUTER APPLICATIONS

SCHEME – BCA – 2022 -23 ONWARDS

VIII SEM

SL	PROGRAM CODE	COURSE CODE	COURSE TITLE	CR / AU	SCHEME OF TEACHING					PREREQUISITE	
					L	T	P	S/P	C	SEM	COURSE CODE
1	106	22CA48XX	PROFESSIONAL ELECTIVE –VIII	CR	02	01	02	--	04	***	***
2	106	22CA48XX	MOOC COURSE -ELECTIVE –IX	CR	02	01	02	--	04	***	***
3	106	22CA4801	PROJECT III	CR	-	-	-	12	06	***	***
					04	02	04	12	14		

TOTAL CREDITS:155

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CIA – Continuous Internal Assessment

The students successfully completing the 4th year will be awarded the “Degree in Bachelor of Computer Applications Honors”

PROFESSIONAL ELECTIVE – VIII & MOOCS COURSE IX

SL	COURSE CODE	COURSE TITLE
1	22CA4802	DISTRIBUTED COMPUTING
2	22CA4803	DEEP LEARNING
3	22CA4804	BLOCK CHAIN TECHNOLOGY
4	22CA4805	GREEN COMPUTING
5	22CA4806	NATURAL LANGUAGE PROCESSING
6	22CA4807	BUSINESS INTELLIGENCE