GOVERNMENT DEGREE COLLEGE FOR WOMEN, KARIMNAGAR
DEPARTMENT OF COMPUTER SCIENCE AND APPLICATIONS

SUBJECT: COMPUTER SCIENCE AND APPLICATIONS
COURSE OUTCOME

Computer programming courses give us an extensive understanding of **various computer operating systems**. In these courses, we can expect to learn how to configure operating systems to work with various kinds of hardware.

A good computer course in a programming language will teach you to **decode computer data, develop software using codes**, and even design software applications over time.

Some core computer science courses you may cover include **theory of computation**, fundamentals of computer science, compliers and operating systems, information theory, basic programming, systems and architecture, software development and testing, web applications and databases, algorithms and data structures, and so on.

FIRST YEAR
SEMESTER I

S.NO	PROGRAMME	TITLE	COURSE CODE	HOURS PER WEEK	CREDITS	OUTCOME
1	B.Com(CA)	Fundamentals of Information Technology	DSC103	3T + 4P	5	• Explain how a computer works, including but not limited to hardware, network, and security features. • Describe how an operating system interacts with hardware and software and principal differences in various operating systems.

						• Explain how computers are networked, and the protocols that govern internet and application communication. • Explain basic cybersecurity issues regarding computer operating systems and networks. • Identify computer systems components and their functions and how the fundamentals of a processor function. • Summarize the assembly and configurations of computer systems, networks, and applications.
2	B.Sc(CS)	Programming in C	DSC - I	4T + 3P	5	• Students will be able to develop logics which will help them to create programs, applications. • By learning C, Students will be able to visualize the inner workings of computer systems, their architecture & the concepts that drive programming. • Students will be able to work on open source projects. • Learners can go to the <u>indeed job search portal</u> to look for open positions in C programming. • Knowing C makes learner a good fit for all kinds of domains. • Teaches students to write code that is exceedingly more efficient in c
3	B.A & B.Sc(CA)	Programming in C	DSC - I	4T + 3P	5	• Students will be able to develop logics which will help them to create programs, applications. • By learning C, Students will be able to visualize the inner workings of computer systems, their architecture & the concepts that drive programming.

						• Students will be able to work on open source projects. • Learners can go to the <u>indeed job search portal</u> to look for open positions in C programming. • Knowing C makes learner a good fit for all kinds of domains. • Teaches students to write code that is exceedingly more efficient in c
4	B.Sc (Data SCIENCE)	Fundamentals of Information Technology	DSC - A	4T + 3P	5	• Explain how a computer works, including but not limited to hardware, network, and security features. • Describe how an operating system interacts with hardware and software and principal differences in various operating systems. • Explain how computers are networked, and the protocols that govern internet and application communication. • Explain basic cybersecurity issues regarding computer operating systems and networks. • Identify computer systems components and their functions and how the fundamentals of a processor function. Summarize the assembly and configurations of computer systems, networks, and applications.

SEMESTER II

S.NO	PROGRAMME	TITLE	COURSE CODE	HOURS PER WEEK	CREDITS	OUTCOME
1	B.Com(CA)	Programming with C & C++	DSC203	3T + 4P	5	• Students will be able to develop logics which will help them to create programs, applications. • By learning C, Students will be able to visualize the inner workings of computer systems, their architecture & the concepts that drive programming. • Students will be able to work on open source projects. • Learners can go to the <u>indeed job search portal</u> to look for open positions in C programming. • Knowing C makes learner a good fit for all kinds of domains. • Teaches students to write code that is exceedingly more efficient in c • Demonstrate an understanding of algorithms in the problem-solving process. • Identify the necessary properties of good problem-solving techniques. • Create and analyse algorithms for solving simple problems.
2	B.Sc(CS)	Programming in C++	DSC - II	4T + 3P	5	• Demonstrate an understanding of algorithms in the problem-solving process. • Identify the necessary properties of good problem-solving techniques. • Create and analyse algorithms for solving simple problems.

						- Use incremental program development to create, test, and debug algorithms for solving simple problems. - To describe the advantages of a high level language like C/C++, the programming process, and the compilation process - To describe and use software tools in the programming process - Describe the functions of an IDE - Use an IDE to compile, load, save, and debug a C/C++ program
3	B.A & B.Sc(CA)	Programming in C++	DSC - II	4T + 3P	5	- Demonstrate an understanding of algorithms in the problem-solving process. - Identify the necessary properties of good problem-solving techniques. - Create and analyse algorithms for solving simple problems. - Use incremental program development to create, test, and debug algorithms for solving simple problems. - To describe the advantages of a high level language like C/C++, the programming process, and the compilation process - To describe and use software tools in the programming process - Describe the functions of an IDE - Use an IDE to compile, load, save, and debug a C/C++ program
4	B.Sc (Data SCIENCE)	Problem Solving and Python Programming	DSC - B	4T + 3P	4	Develop algorithmic solutions to simple computational problems.

S.NO	PROGRAMME	TITLE	COURSE CODE	HOURS PER WEEK	CREDITS	OUTCOME
						• Demonstrate programs using simple Python statements and expressions. • Explain control flow and functions concept in Python for solving problems. • Use Python data structures – lists, tuples & dictionaries for representing compound data. • Explain files, exception, modules and packages in Python for solving problems.

SECOND YEAR

SEMESTER III

S.NO	PROGRAMME	TITLE	COURSE CODE	HOURS PER WEEK	CREDITS	OUTCOME
1	B.Com(CA)	Relational Database Management System	DSC303	3T + 4P	5	• Students get practical knowledge on designing and creating database. • Understand various queries execution such as relational constraints, joins, set operations, aggregate functions, trigger, views and embedded SQL. • Use of various software to design and build ER Diagrams, UML, Flow chart for related database systems. • Students will be able to design and implement database applications • *apply* and *relate* the concept of transaction, concurrency control and recovery in database. • recovery system and be familiar with introduction to web database, distribute databases, data warehousing and mining.

2	B.Sc(CS)	Data Structures using C++	DSC - III	4T + 3P	5	• Explain the features of C++ using object oriented programming. • Describe the relative merits of C++ as an object oriented programming language. • Describe the major object-oriented concepts to implement object oriented programs in C++ Using encapsulation and inheritance. • Describe the major object-oriented concepts to implement object oriented programs in C++ Using polymorphism. • Explain the advanced features of C++ specifically stream I/O, templates and operator overloading. •
3	B.A & B.Sc(CA)	Relational Data Base Management Systems (RDBMS)	DSC - III	4T + 3P	5	• Students get practical knowledge on designing and creating database. • Understand various queries execution such as relational constraints, joins, set operations, aggregate functions, trigger, views and embedded SQL. • Use of various software to design and build ER Diagrams, UML, Flow chart for related database systems. • Students will be able to design and implement database applications • *apply* and *relate* the concept of transaction, concurrency control and recovery in database. • recovery system and be familiar with introduction to web database, distribute databases, data warehousing and mining.
4	B.Sc (Data SCIENCE)	Data Engineering with Python	DSC - C	4T + 3P	4	• Demonstrate your Skills in Python - the language of choice for Data Engineering.

| | | | | | | • Implement Web scraping, and use APIs to extract data in Python. |
| | | | | | | • Play the role of a Data Engineer working on a real project to extract, transform and load data using Jupiter notebook and Watson Studio. |

SEMESTER IV

S.NO	PROGRAMME	TITLE	COURSE CODE	HOURS PER WEEK	CREDITS	OUTCOME
1	B.Com(CA)	Web Technologies	DSC403	3T + 4P	5	• Explain the history of the internet and related internet concepts that are vital in understanding web development. • Discuss the insights of internet programming and implement complete application over the web. • Demonstrate the important HTML tags for designing static pages and separate design from content using Cascading Style sheet. • Utilize the concepts of JavaScript and Java Use web application development software tools i.e. Ajax, PHP and XML etc. and identify the environments currently available on the market to design web sites •
2	B.Sc(CS)	Data Base Management Systems (DBMS)	DSC - IV	4T + 3P	5	• Describe the fundamentals of File processing and database processing system. • Explain the various data model and its application. • Explain the various normal forms and its role in DBMS.

						- Explain the fundamental concepts of SQL programs. - Describe the concepts of function, procedure, package, trigger and exception handling.
3	B.A & B.Sc(CA)	Multimedia Systems	DSC - IV	4T + 3P	5	- Create a well-designed, interactive Web site with respect to current standards and practices - Demonstrate in-depth knowledge in an industry-standard multimedia development tool and its associated scripting language - Determine the appropriate use of interactive verses standalone Web applications - Create time-based and interactive multimedia components - Identify issues and obstacles encountered by Web authors in deploying Web-based applications
4	B.Sc (Data SCIENCE)	Machine Learning	DSC - D	4T + 3P	4	- Develop an appreciation for what is involved in Learning models from data - Understand a wide variety of learning algorithms - Understand how to evaluate models generated from data - Apply the algorithms to a real problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the models

THIRD YEAR

SEMESTER V

S.NO	PROGRAMME	TITLE	COURSE CODE	HOURS PER WEEK	CREDITS	OUTCOME
1	B.Com(CA)	Management Information System	DSC503	3T + 4P	5	• describe managing the digital firm • interpret information systems in the enterprise • explain relationships between concepts of information systems, organization, management and strategy • debate infrastructure of information technology illustrate redesigning the organization with information systems
2	B.Sc(CS)	Programming in JAVA	DSC - V	4T + 3P	5	• Use the syntax and semantics of java programming language and basic concepts of OOP. • Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages. • Apply the concepts of Multithreading and Exception handling to develop efficient and error free codes. • Design event driven GUI and web related applications which mimic the real word scenarios.
3	B.A & B.Sc(CA)	Programming in JAVA	DSC - V	4T + 3P	5	• Use the syntax and semantics of java programming language and basic concepts of OOP.

						• Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages. • Apply the concepts of Multithreading and Exception handling to develop efficient and error free codes. Design event driven GUI and web related applications which mimic the real word scenarios.
4	B.Sc (Data SCIENCE)	Natural Language Processing	PAPER VI – A DSE - A	4T + 3P	4	• Understand Natural Language Processing. • Probabilistic model of defining language and techniques.(Application) • Applying Hidden Markov model and Speech Recognition.(Application) • Application of context free grammar and language parsing.(Application) • Implement probabilistic and language parsing.(Application) • Differentiation of semantic and discourse in terms of NLP.(Analyse)
5	B.Sc (Data SCIENCE)	No SQL Data Bases	PAPER VI – A DSE - B	4T + 3P	4	• Define, compare and use the four types of NoSQL Databases (Document-oriented, KeyValue Pairs, Column-oriented and Graph). • Demonstrate an understanding of the detailed architecture, define objects, load data, query data and performance tune Column-oriented NoSQL databases. • Explain the detailed architecture, define objects, load data, query data and

						performance tune Document-oriented NoSQL databases. • Demonstrate an understanding of the detailed architecture, define objects, load data, query data and performance tune Key-Value Pair NoSQL databases. • Explain the detailed architecture, define objects, load data, query data and performance tune Graph NoSQL databases. • Evaluate NoSQL database development tools and programming languages. • Perform hands-on NoSql database lab assignments that will allow students to use the four NoSQL database types via products such as Cassandra, Hadoop Hbase, MongoDB, Neo4J and Riak.
6	R-16 B.Sc(CS)	Python Programming	DSC - V	4T +2P	5	• Define and demonstrate the use of built-in data structures "lists" and "dictionary". • Design and implement a program to solve a real world problem. • Design and implement GUI application and how to handle exceptions and files. • Make database connectivity in python programming language.
7	R-16 B.Sc(CS)	Operating Systems	DSC - VI	4T +2P	5	• Describe the basic components of an operating system and their role in implementations for general purpose, real-time and embedded applications.

						• Define the concepts of processes, threads, asynchronous signals and competitive system resource allocation. • Explain what multi-tasking is and outline standard scheduling algorithms for Multi-tasking. • Discuss mutual exclusion principles and their use in concurrent programming including semaphore construction and resource allocation. Expose the details of major operating system concepts, overview of system memory management and the implementation of file systems.
8	R-16 B.Sc(CA)	Programming with C++	DSC - V	4T + 2P	5	• Demonstrate an understanding of algorithms in the problem-solving process. • Identify the necessary properties of good problem-solving techniques. • Create and analyse algorithms for solving simple problems. • Use incremental program development to create, test, and debug algorithms for solving simple problems. • To describe the advantages of a high level language like C/C++, the programming process, and the compilation process • To describe and use software tools in the programming process • Describe the functions of an IDE

9	R-16 B.Sc(CA)	Operating Systems	DSC – VI	4T + 2P	5	• Describe the basic components of an operating system and their role in implementations for general purpose, real-time and embedded applications. • Define the concepts of processes, threads, asynchronous signals and competitive system resource allocation. • Explain what multi-tasking is and outline standard scheduling algorithms for Multi-tasking. • Discuss mutual exclusion principles and their use in concurrent programming including semaphore construction and resource allocation. • Expose the details of major operating system concepts, overview of system memory management and the implementation of file systems.
10	R-16 B.Com(CA)	Objective Oriented Programming with C++	BCO506 DSE-1E	3T + 4P	5	• Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects. • Understand dynamic memory management techniques using pointers, constructors, destructors, etc • Describe the concept of function overloading, operator overloading, virtual functions and polymorphism. • Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.

S.NO	PROGRAMME	TITLE	COURSE CODE	HOURS PER WEEK	CREDITS	OUTCOME
						• Demonstrate the use of various OOPs concepts with the help of programs .

SEMESTER VI

S.NO	PROGRAMME	TITLE	COURSE CODE	HOURS PER WEEK	CREDITS	OUTCOME
1	B.Com(CA)	Multimedia Systems	DSC603	3T + 4P	5	• Create a well-designed, interactive Web site with respect to current standards and practices • Demonstrate in-depth knowledge in an industry-standard multimedia development tool and its associated scripting language • Determine the appropriate use of interactive verses standalone Web applications • Create time-based and interactive multimedia components Identify issues and obstacles encountered by Web authors in deploying Web-based applications
2	B.Sc(CS)	Web Technologies	DSC - VI	4T + 3P	5	• Explain the history of the internet and related internet concepts that are vital in understanding web development. • Discuss the insights of internet programming and implement complete application over the web. • Demonstrate the important HTML tags for designing static pages and

						separate design from content using Cascading Style sheet. • Utilize the concepts of JavaScript and Java • Use web application development software tools i.e. Ajax, PHP and XML etc. and identify the environments currently available on the market to design web sites.
3	B.A & B.Sc(CA)	Web Technologies	DSC - VI	4T + 3P	5	• Explain the history of the internet and related internet concepts that are vital in understanding web development. • Discuss the insights of internet programming and implement complete application over the web. • Demonstrate the important HTML tags for designing static pages and separate design from content using Cascading Style sheet. • Utilize the concepts of JavaScript and Java Use web application development software tools i.e. Ajax, PHP and XML etc. and identify the environments currently available on the market to design web sites.
4	B.Sc (Data SCIENCE)	Big Data	PAPER VII – A DSE - A	4T + 3P	4	• Understand the Big Data Platform and its Use cases • Provide an overview of Apache Hadoop • Provide HDFS Concepts and Interfacing with HDFS

5						• Understand Map Reduce Jobs • Provide hands on Hodoop Eco System • Apply analytics on Structured, Unstructured Data. • Exposure to Data Analytics with R.
5	B.Sc (Data SCIENCE)	Deep Learning	PAPER VII – B DSE - B	4T + 3P	4	▪ Develop an appreciation for what is involved in Learning models from data ▪ Understand a wide variety of learning algorithms ▪ Understand how to evaluate models generated from data ▪ Apply the algorithms to a real problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the models
6	R-16 B.SC(CS)	Software Engineering	DSC - VII	4T + 2P	5	• Basic knowledge and understanding of the analysis and design of complex systems. • Ability to apply software engineering principles and techniques. • Ability to develop, maintain and evaluate large-scale software systems. • To produce efficient, reliable, robust and cost-effective software solutions. • Ability to perform independent research and analysis. • To manage time, processes and resources effectively by prioritising competing demands to achieve

7	R–16 B.Sc(CS)	VB.Net	DSC - VIII	4T + 2P	5	• Design, formulate, and construct applications with VB.NET. • Integrate variables and constants into calculations applying VB.NET. • Determine logical alternatives with VB.NET decision structures. • Implement lists and loops with VB.NET controls and iteration. • Separate operations into appropriate VB.NET procedures and functions • Assemble multiple forms, modules, and menus into working VB.NET solutions • Create VB.NET programs using multiple array techniques • Build integrated VB.NET solutions using files and structures with printing capabilities • Translate general requirements into data-related solutions using database concepts
8	R-16 B.Sc(CA)	Computer Networking	DSC – VII	4T + 2P	5	• Explain the local, metropolitan and wide area networks using the Standard OSI reference model. • Discussion of various networking technologies. • Explain the concepts of protocols, network interfaces and design of performance issues in local area networks and wide area networks. • Describe about wireless networking concepts, contemporary issues in

9	R-16 B.Sc(CA)					• networking technologies, network tools and network programming. • Explain the analysis of different types of protocol and the comparison of number of data link, network and transport layer protocols.
9	R-16 B.Sc(CA)	VB	DSC - VIII	4T + 2P	5	• Explain the basic Concepts of Program building block control statements and the basic concepts of function and procedure. • Describe the functionality and properties of GUI based ActiveX Control with example programs • 10Discuss about graphics handling related control and properties. • Discuss about the fundamental functions and properties of Advanced ActiveX Control. • Describe the concepts of database handling using DAO, ADO and RDO control with data report concepts.
10	R-16 B.Com(CA)	E- Commerce	BCO607 DSE–1E	3T + 4P	5	• Explain the concept of ecommerce and its revolution. • Explain the infrastructure of the Internet and how the various elements contribute to the marketing distribution solutions. • Explain and develop solutions for implementing an ecommerce site. • Discuss security and ecommerce and the ramifications of neglecting it.

						- Create a marketing plan and promotional plan for an ecommerce site. - Evaluate a payment system for a site. - Create a strategy for the different, non-traditional areas surrounding ecommerce. - Implement, in simulation or authentically, an ecommerce site.
11	R-16 B.Com(CA)	Management Information System	BCO608 DSE-2E	5T	5	- describe managing the digital firm - interpret information systems in the enterprise - explain relationships between concepts of information systems, organization, management and strategy - debate infrastructure of information technology - illustrate redesigning the organization with information systems

PROGRAMME OUTCOMES (PO)

Our learning outcomes are statements that describe skills that we expect to enable our student to attain by the time of graduation.

B. Sc (Computer Science) Learning Outcomes:

1. Learn how to organize information efficiently in the forms of outlines, charts, etc. by using appropriate software. Develop the skills to present ideas effectively and efficiently.
2. Do Academic and Professional Presentations - Designing and delivering an effective presentation and developing the various IT skills to the electronic databases.
3. Use the Systems Analysis Design paradigm to critically analyse a problem. Solve the problems (programming networking database and Web design) in the Information Technology environment. Function effectively on teams to accomplish a common goal and demonstrate professional behaviour.
4. Develop IT-oriented security issues and protocols. Design and implement a web page. Improve communication and business management skills, especially in providing technical support. Serve as the System Administrators with thorough knowledge of DBMS.

B. Com (Computer Applications) Learning Outcomes:

- Demonstrate a basic understanding of computer hardware and software.
- Demonstrate problem-solving skills.
- Apply logical skills to programming in a variety of languages.
- Utilize web technologies.
- Present conclusions effectively, orally, and in writing.

- Demonstrate basic understanding of network principles.

- Working effectively in teams

- Apply the skills that are the focus of this program to business scenarios.

B. Sc (Data Science) Learning Outcomes:

- Apply mathematical principles to the analysis of data

- Analyse very large data sets in the context of real-world problems

- Develop and implement data analysis strategies base on theoretical principles, ethical considerations, and detailed knowledge of the underlying data

- Demonstrate an ability to articulate, assess and apply appropriate theories and principles of information management

- Demonstrate presentation proficiency for written, oral and visual communications in the contest of traditional and digital forms of communication

- Demonstrate knowledge of the underlying principles and evaluation methods for analysing information for financial decision-making, investing capital, budgeting and forecasting

- Demonstrate an understanding of the interdisciplinary nature of data, information and communications and its influence on incremental and disruptive innovation

- Demonstrate an understanding of appropriate research methods used to collect and analyze data for decision-making and communications; inclusive of traditional and digital forms of communication

- Demonstrate an understanding of cultural and global perspectives as they apply to all forms of enterprise, the management of information, and communications with a wide range of stakeholders

- Articulate and evaluate appropriate legal and ethical standards pertaining to all forms of communications and network security

PROGRAM SPECIFIC OUTCOMES (PSO)

- Apply standard software engineering process and strategies in software project development using open source programming environment to deliver a quality product for business success.

- Acquaintance with latest trends in technological development and thereby innovate new ideas and solutions to existing problems.

- Conceptual grounding in computer usage as well as its practical business applications.

- To demonstrate advanced skills in the effective analysis design and realization of business system utilizing contemporary information technology.

- Apply fundamental principles and methods of Computer Science to a wide range of applications.

- Design, correctly implement and document solutions to significant computational problems.

- Impart an understanding of the basics of our discipline.

- Prepare for continued professional development.

- Develop proficiency in the practice of computing