



Department of Computer Science
B.Sc. Computer Science (Cloud Computing and Cyber Security)

S.No	Course Code	Course Name	Course Outcomes
SEMESTER- I			
1.	23UTAG11	Podhu Tamil / Hindi - I	<p>CO1[K1]: பாரதியார் காலந்தொட்டு தற்காலக் கவிதைகள் வரை கவிதை இலக்கியம் அறிமுகப்படுத்தப்படுவதால் அவற்றை அடையாளம் காண்பர்.</p> <p>CO2[K2]: கவிதை வரலாற்றினை புரிந்து கொண்டு பிழை இல்லாமல் எழுதும் திறன் பெறுவர்.</p> <p>CO3[K3]: இக்கால இலக்கிய வகைகள் மற்றும் இலக்கணம் கற்பதன் மூலம் அவற்றை தம் வாழ்நிலையோடு பொருத்திப் பார்ப்பர்.</p> <p>CO4[K4]: மொழியறிவோடு சிந்தனைத்திறன் பெற்று இலக்கியம் மற்றும் இலக்கணங்களைப் பகுப்பாய்வர்.</p> <p>CO5[K5]: உலகளாவிய இலக்கியங்களைக் கற்று மதிப்பீடு செய்வர்.</p>



2.	23UENL11	General English – I	<p>C01[K1]: identify the use of the language skills i.e. Reading, Listening, Speaking and Writing.</p> <p>C02[K2]: demonstrate communicative skills by articulating simple dialogues and instructions.</p> <p>C03[K3]: apply knowledge of word power and grammar in framing correctsentences.</p> <p>C04[K4]: analyze prose, poetry and short stories to develop language skills through literature.</p> <p>C05[K5]: assess the linguistic competence that enables them, in the future, to present their views in various social, academic and</p>
3.	23UCYC11	Core Course - I: Python Programming	<p>C01[K1]: describe the concepts of python</p> <p>C02[K2]: discuss arrays, control statements, Lists and file handling of python</p> <p>C03[K3]: apply the concept of python to implement simple problem</p> <p>C04[K4]: analyze arrays, control statements, lists, tuples, dictionary and functions</p> <p>C05[K6]: develop a solution for a simple program using python concepts</p>
4.	23UCYC1P	Core Course - II: Practical: Python Programming	<p>C01[K2]: demonstrate the syntax and semantics of python language</p> <p>C02[K3]: find out the problem and solve using python programming techniques.</p> <p>C03[K4]: discover suitable programming constructs for problem solving.</p> <p>C04[K5]: evaluate various concepts of python language to solve the problem in an efficient way.</p> <p>C05[K6]: develop a python program for a given problem</p>



5.	23UCYA11	Elective Course Generic / Discipline Specific -I: Discrete Mathematics-I	<p>CO1[K1]: define the discrete objects in the context of mathematical structures for computer science and applications</p> <p>CO2[K2]: recognize the properties of set operations, relations and functions, matrix operations, logic statements, various graphs</p> <p>CO3[K3]: compute various operations on sets, relations, functions, matrices, graphs and truth values of logic statements</p> <p>CO4[K4]: classify the types of relations, functions, matrices, logic statements and graphs</p> <p>CO5[K5]: assess the equivalency of relations, invertibility of functions, tautological implications and equivalence of logic formulae, the</p>
6.	23UCYS11	Skill Enhancement Course - I: Foundation – Programming in C	<p>CO1[K1]: describe various concepts of C</p> <p>CO2[K2]: illustrate the statements, arrays, functions, structures and pointers</p> <p>CO3[K3]: apply simple solutions using appropriate programming control statements of C</p> <p>CO4[K4]: analyze the working of control statements, arrays, functions and pointers</p> <p>CO5[K5]: choose the appropriate way for providing a solution using C</p>
7.	23UCYN11	Skill Enhancement Course - II Non Major Elective Course: Understanding The Internet	<p>CO1[K1]: describe the basic concepts of internet</p> <p>CO2[K2]: explain the various features of concept of internet</p> <p>CO3[K3]: write about internet, web, searching and creating web pages</p> <p>CO4[K4]: analyze the applications of internet</p> <p>CO5[K5]: assess the concepts of internet</p>



SEMESTER- II

8.	23UTAG21	Podhu Tamil / Hindi – II	<p>CO1[K1]: பக்தி இலக்கியங்களைக் கற்பதன் மூலம் பக்தி நெறியினையும், சமய நல்லிணக்கத்தையும் அறிவர்.</p> <p>CO2[K2]: சமயப்பாடல்கள் மற்றும் சிற்றிலக்கியங்களின் அமைப்பினையும், நோக்கத்தினையும் தெளிவாகக் கூறுவர்.</p> <p>CO3[K3]: தமிழில் உள்ள பக்தி இலக்கியம் மற்றும் சிற்றிலக்கியங்களின் பொருண்மைகளுடன் இலக்கணத் தெளிவையும் அடைவர்.</p> <p>CO4[K4]: தமிழ்ச் சமூகப் பண்பாட்டு வரலாற்றினை இலக்கியங்கள் வாயிலாக அறிந்து கொண்டு பாகுபடுத்துவர்.</p> <p>CO5[K5]: போட்டித் தேர்வுகளில் வெற்றி பெறுவதற்குத் தமிழ்ப் பாடத்தினைப்</p>
9.	23UENL21	General English – II	<p>CO1 [K1]: identify appropriate literary terms such as diction, tone, imagery, figures of speech, motif etc.,</p> <p>CO2 [K2]: define verbs, tenses and concord and its role in speaking and writing effectively.</p> <p>CO3 [K3]: apply the knowledge of language competency at workplace and day-to- day life</p> <p>CO4 [K4]: analyze prose, poetry and short stories to develop language skillsthrough literature.</p>
10.	23UCYC21	Core Course - III: Data Structures & Algorithms	<p>CO1[K1]: describe the concepts of data structures</p> <p>CO2[K2]: explain the working of data structures</p> <p>CO3[K3]: apply the required data structure to solve a problem</p> <p>CO4[K4]: analyze the working of data structures</p> <p>CO5[K5]: choose appropriate data structure to solve a problem.</p>



11.	23UCYC2P	Core Course - IV: Practical: Data Structures & Algorithms	CO1[K2]: demonstrate the concept of data structures CO2[K3]: apply required data structure to solve a problem CO3[K4]: analyze the appropriate data structure to solve a problem CO4[K5]: develop a program involving graphs, trees and heaps. CO5[K6]: construct programs with required data structure algorithm
12.	23UCYA21	Elective Course Generic/ Discipline Specific -II: Discrete Mathematics – II	CO1[K1]: state the basic terminologies of linear programming problem, transportation problem, assignment problem, curve fitting, numerical solutions of polynomial equations CO2[K2]: explain the methods of solving linear programming problem, transportation problem, assignment problem, fitting curve for given data, solving polynomial equations numerically CO3[K3]: find optimal solution of linear programming problem, transportation problem, assignment problem, numerical solution of polynomial equations and a curve that best fit the given data CO4[K4]: examine the optimality of solutions of linear programming problem, transportation problem, assignment problem and the empirical relation of given data



13.	23UCYS2P	Skill Enhancement Course - III: Office Automation	<p>CO1[K2]: demonstrate the options in word, spreadsheet and powerpoint</p> <p>CO2[K3]: apply the various options in office package</p> <p>CO3[K4]: analyze appropriate tools and options to create a neat document, worksheet and presentation</p> <p>CO4[K5]: choose the required tools in word, spreadsheet and powerpoint to produce the required output</p> <p>CO5[K6]: design a simple document, presentation slide and do</p>
14.	23UCYN21	Skill Enhancement Course - IV: Non Major Elective Course : Advanced Excel	<p>CO1[K1]: describe the basic functions, validation techniques, pivot tables, data time functions and charts</p> <p>CO2[K2]: explain the steps for validation, creating pivot tables, charts and syntax of formulas, data time functions</p> <p>CO3[K3]: apply required steps for creating validation, pivot tables, charts</p> <p>CO4[K4]: analyze different chart types, date time functions and various validation techniques</p> <p>CO5[K6]: create an Excel sheet with tables, charts, date time functions.</p>
SEMESTER- III			
15.	23UTAG31	Podhu Tamil/Hindi- III	<p>CO1[K1]: இலக்கியங்களின் வழி வாழ்வியல் சிந்தனைகள் பற்றி அறிவர்.</p> <p>CO2[K2]: காப்பிய சமயக் கருத்துக்களையும் நோக்கங்களையும் அடையாளம் காண்பர்.</p> <p>CO3[K3]: தமிழ் புதினங்களின் வழி சமகாலப் படைப்புகளின் வாழ்க்கை முறையின் ஆற்றலைப் பெறுவர்.</p> <p>CO4[K4]: காப்பியங்கள் மற்றும் புதினங்களின் வரலாற்றினைப் பாகுபடுத்துவர்.</p>



16.	23UENL31	General English – III	<p>CO1 [K1]: relate and state ideas by reading simple poems and scenes From Shakespearean plays.</p> <p>CO2 [K2]: demonstrate effective speaking skills by listening to speeches of famous personalities and express it in day-to-day life.</p> <p>CO3 [K3]: apply the knowledge of language competency in writing letters, emails and display social etiquettes in everyday life.</p> <p>CO4 [K4]: analyse data interpretation, meeting etiquettes, organizing And participating in a meeting.</p> <p>CO5 [K5]: develop language skills through literature and assess the</p>
17.	23UCYC31	Core Course - V: Database Management Systems	<p>CO1[K1]: describe the concepts of database systems</p> <p>CO2[K2]: explain the basics of database, design concepts, normalization, SQL,PL/SQL</p> <p>CO3[K3]: apply required SQL, PL/SQL to solve a database problem</p> <p>CO4[K4]: analyze database concepts, ER model, various control structures inPL/SQL</p> <p>CO5[K6]: develop database schema and perform SQL and PL/SQL</p>
18.	23UCYC3P	Core Course - VI: Practical: Database Management Systems	<p>CO1[K2]: demonstrate the commands required to create, alter and handle tables</p> <p>CO2[K3]: apply various SQL, PL/SQL constructs for a database system</p> <p>CO3[K4]: analyze a given database problem and to design a database schema</p> <p>CO4[K5]: develop database system solutions using SQL and PL/SQL</p> <p>CO5[K6]: create solution based on a database systems</p>



19.	23UCYA31	Elective Course Generic/ Discipline Specific -III: Numerical Methods	<p>CO1[K1]: describe the basic concepts in numerical analysis</p> <p>CO2[K2]: explain the methods of solving algebraic, transcendental, differential equations</p> <p>CO3[K3]: apply numerical methods to obtain approximate solutions of algebraic, transcendental and differential equations, numerical differentiation and integration of given functions</p> <p>CO4[K4]: examine the numerical solution of algebraic, transcendental differential equations, numerical differentiation and integration of functions and interpolating values of the given data</p> <p>CO5[K5]: determine the appropriate method of solving algebraic, transcendental differential equations numerically and integration of functions and finding missing values of a given</p>
20.	23UCYS31	Skill Enhancement Course- V: (Entrepreneurial Skill)- Software Testing	<p>CO1[K1]: describe various types of software testing</p> <p>CO2[K2]: explain the concepts of software testing</p> <p>CO3[K3]: write the required steps to perform various testing</p> <p>CO4[K4]: analyze different testing methods</p> <p>CO5[K5]: assess the appropriate testing method for a given scenario</p>
21.	23UCYS3P	Skill Enhancement Course - VI: Web Designing	<p>CO1[K2]: demonstrate various HTML tags</p> <p>CO2[K3]: apply the required HTML tags and attributes to design a website</p> <p>CO3[K4]: analyze the appropriate HTML tags and CSS to create a neat website.</p> <p>CO4[K5]: choose the required tags, CSS and Ajax technology to create a website.</p>



SEMESTER- IV

22.	23UTAG41	Podhu Tamil / Hindi – IV	<p>CO1[K1]: சங்க இலக்கியத்தில் காணப்பெறும் அறக்கருத்துக்களை அறிந்து கொள்வர்.</p> <p>CO2[K2]: சங்க இலக்கியங்கள் மற்றும் நாடக இலக்கியம் வாயிலாக மக்களின் வாழ்க்கை முறையினை எடுத்துரைப்பர்.</p> <p>CO3[K3]: நாடக இலக்கியம் மூலம் நடிப்பாற்றலையும், கலைத்தன்மையையும், படைப்பாற்றலையும் கற்பர். மேலும் மொழிபெயர்ப்பு ஆற்றலையும் பெறுவர்.</p> <p>CO4[K4]: கலைச்சொற்களைக் கண்டறிந்து அவற்றோடு தொடர்புடைய சொல்லைப்பகுப்பர்.</p>
23.	23UENL41	General English – IV	<p>CO1 [K1]: state ideas effectively and appropriately in real life situations.</p> <p>CO2 [K2]: demonstrate speaking skills in appreciating literature.</p> <p>CO3 [K3]: use grammar and pronunciation effectively and appropriately.</p> <p>CO4 [K4]: examine the literary works to develop language skills.</p> <p>CO5 [K6]: construct grammatically correct and meaning full sentences.</p>
24.	23UCYC41	Core Course - VII: Industry Module- Java Programming	<p>CO1[K1]: describe the various concepts of Java programming</p> <p>CO2[K2]: explain the Java Programming paradigms in detail</p> <p>CO3[K3]: apply the required Java techniques to solve simple problem.</p> <p>CO4[K4]: analyze the concepts of Inheritance, Multithreading, Exception handling and Swings</p> <p>CO5[K5]: choose appropriate java constructs to solve a basic problem</p>



25.	23UCYC4P	Core Course - VIII: Practical: Java Programming	<p>CO1[K2]: demonstrate the constructs of Java</p> <p>CO2[K3]: apply the required concepts of Java to solve a simple problem</p> <p>CO3[K4]: analyze various control statements in java</p> <p>CO4[K5]: examine the working Java statements, exception, threading and Swing controls</p> <p>CO5[K6]:create a simple java program</p>
26.	23UCYA41	Elective Course Generic/ Discipline Specific -IV: Computer Networks	<p>CO1[K1]: define the basics of computer network architecture, OSI and TCP/IP reference models</p> <p>CO2[K2]: explain the working and performance of telephone systems and satellite communications</p> <p>CO3[K3]: state the concept of elementary data link protocols</p> <p>CO4[K4]: analyze the characteristics of routing and congestion control algorithms</p> <p>CO5[K5]: discuss about network security and various protocols such as</p>
27.	23UCYS4P	Skill Enhancement Course - VII: PHP Programming	<p>CO1[K2]: demonstrate the PHP server side scripts</p> <p>CO2[K3]: apply required PHP constructs to create a server side script</p> <p>CO3[K4]: examine the possible PHP constructs to solve a server side application</p> <p>CO4[K5]: choose PHP scripts to handle HTML forms</p> <p>CO5[K6]: develop dynamic web pages using PHP</p>



28.	23UCYS41	Skill Enhancement Course – VIII: Cyber Forensics	CO1[K1]: recall the concepts of cyber forensics CO2[K2]: explain the cyber forensics fundamentals CO3[K3]: apply the methods for data recovery, evidence collection and data seizure. CO4[K4]: analyze various computer forensic systems CO5[K5]: evaluate the different types of computer forensics technology
29.	23UESR41	Environmental Studies	CO1[K1]: recognize the importance of environment and role of Individuals in its protection. CO2[K2]: explain the key concepts of Ecosystem, biodiversity and climatic change CO3[K3]: apply the right measures for the sustainable use of natural resources. CO4[K4]: analyse the ethical, cross-cultural, and historical context of environmental issues and the links between Human and natural Systems. CO5[K5]: evaluate the impact of human action on the biological environment

SEMESTER- V



30.	23UCYC51	Core Course - IX: Machine Learning	CO1[K1]: appreciate the importance of visualization in the data analytics solution CO2[K2]: apply structured thinking to unstructured problems CO3[K3]: understand a very broad collection of machine learning algorithms and problems CO4[K4]: learn algorithmic topics of machine learning and mathematically deep enough to introduce the required theory CO5[K5]: develop an appreciation for what is involved in learning from
31.	23UCYC52	Core Course - X: Cloud Computing	CO1[K1]: describe the terminologies of Cloud computing. CO2[K2]: explain the services given by cloud computing. CO3[K3]: use the cloud in designing an application. CO4[K4]: examine the cloud application in benchmarking and tuning. CO5[K5]: evaluate the application of cloud in various fields tuning
32.	23UCYC5P	Core Course - XI: Practical: Cloud Computing	CO1[K2]: demonstrate the concept of Cloud computing. CO2[K3]: apply the services given by cloud computing. CO3[K4]: analyze to design and cloud application CO4[K5]: evaluate the cloud application. CO5[K6]: integrate the application of cloud in various fields.



33.	23UCYJ51	Core Course - XII: Project with Viva-Voce	CO1[K2]: express their views with ppt illustrations and critical support CO2[K3]: organize the views and solutions as modules of the project CO3[K4]: analyze the various possible solutions of the chosen problem domain CO4[K5]: evaluate the adopted solution with various testing CO5[K6]: compile the development of solution as Documentation
34.	23UCY051	Elective Courses Generic/ Discipline Specific -V: Operating Systems	CO1[K1]: describe the fundamentals of OS, process life cycle, Scheduling algorithms, Deadlock and Memory management CO2[K2]: summarize the process involving threads and semaphores CO3[K3]: apply respective algorithms for handling deadlock CO4[K4]: analyze various methods to schedule the process and managing memory CO5[K5]: determine memory management and organization



35.	23UCY052	Elective Courses Generic/ Discipline Specific -V: .NET Programming	<p>CO1[K1]: describe CLR, C# Fundamental, IDE, Data Reader, Adapter and dataBinding, XML Classes in .NET Framework</p> <p>CO2[K2]: summarize Web Form Controls, File Stream Classes, File Mode & its Operations, Data Controls and its Operations in Web application creation</p> <p>CO3[K3]: use Web Form and HTML controls in a Web Application, File streamoperations, Grid View control in Database operation.</p> <p>CO4[K4]: examine various conditional and looping statements, authentication and Authorization properties in Web application creation</p> <p>CO5[K5]: choose conditional and looping statements, HTML and Web form controlsand Validation controls in creating Web applications</p>
36.	23UCY053	Elective Courses Generic/ Discipline Specific -VI: Big Data Analytics	<p>CO1[K1]: recognize the evolution of big data.</p> <p>CO2[K2]: discuss the classification and clustering,</p> <p>CO3[K3]: apply and split data using classification and clustering.</p> <p>CO4[K4]: analyze data streams clustering</p> <p>CO5[K5]: evaluate the usage of NOSQL in Big Data</p>



37.	23UCY054	Elective Courses Generic/ Discipline Specific -VI: Introduction to Data Science	C01[K1]: describe data, data science process, machine learning algorithms andHadoop C02[K2]: explain data, data science process, machine learning algorithms andHadoop C03[K3]: write about data science process, machine learning algorithms And Hadoop C04[K4]: analyze different data science process and machine learning Algorithms C05[K5]: justify appropriate data science process and machine learning
38.	23UVED51	Value Education	C01[K1]: identify the basic human values and ethics necessary for harmonious humanrelationship C02[K2]: explain the significance of social values and religious tolerance to live in peace C03[K3]: articulate the life-changing principles of brotherhood, honesty, loyalty andcommunity solidarity C04[K4]: analyse emotional, social, spiritual attribute to acquire well balancedpersonality C05[K5]: assess the importance of harmonious living in the multi-cultural pluralistic society



39.	23UCYJ52	Internship/Industrial Training	<p>C01[K1]: identify different career paths within the industry and gain insights into potential future roles.</p> <p>C02[K3]: apply theoretical concepts and academic knowledge to real-world situations and challenges encountered during the internship.</p> <p>C03[K4]: analyse problems, generate innovative solutions, and make informed decisions.</p> <p>C04[K5]: evaluate how to manage time effectively and prioritize tasks to meet deadlines and deliver quality work.</p> <p>C05[K6]: create a portfolio of the work, projects, and achievements during the internship.</p>
SEMESTER- VI			
40.	23UCYC61	Core Course – XIII: Cyber Security	<p>C01[K1]: describe the concepts of cyber security</p> <p>C02[K2]: explain the features of cyber security</p> <p>C03[K3]: apply cyber security algorithms to solve simple real world problem</p> <p>C04[K4]: differentiate various governing bodies of cyber laws</p> <p>C05[K5]: evaluate various privacy policies for an organization</p>



41.	23UCYC62	Core Course - XIV: Cryptography & Network Security	CO1[K1]: describe process of the cryptographic algorithms CO2[K2]: illustrate encryption and decryption techniques CO3[K3]: apply security techniques to solve network security problem CO4[K4]: compare and apply different encryption and decryption techniques to solve problems related to confidentiality and authentication CO5[K5]: evaluate the use of appropriate security techniques to solve network security problem
42.	23UCYC6P	Core Course - XV: PRACTICAL : Cryptography & Network Security	CO1[K2]: recall the basic concepts of Cryptography and Network security. CO2[K3]: use Symmetric and Asymmetric key algorithms for cryptography and Network Security. CO3[K4]: examine the various malware attacks and analyze various encryption and decryption techniques. CO4[K5]: evaluate the uses of different encryption and decryption techniques. CO5[K6]: develop simple digital signature scheme and cryptographic algorithms.



43.	23UCY061	Elective Courses Generic/ Discipline Specific -VII: Information Security	CO1[K1]: describe information security, computer security, cryptographic techniques and program security CO2[K2]: describe information security, computer security, cryptographic techniques and program security CO3[K3]: write about information security, computer security, cryptographic techniques and program security CO4[K4]: analyze information security, computer security, cryptographic techniques CO5[K5]: assess information security, computer security, cryptographic techniques
44.	23UCY062	Elective Courses Generic/ Discipline Specific -VII: Human Computer Interaction	CO1[K1]: explain the fundamentals of Human Computer Interaction CO2[K2]: describe the Human Computer Interaction design and software process technologies CO3[K3]: write about design & software process, models and theories, mobile HCI CO4[K4]: analyze various Human Computer Interaction CO5[K5]: assess the various types of Web Interface Design



45.	23UCY063	Elective Courses Generic/ Discipline Specific -VIII: Ethical Hacking	<p>CO1[K1]: describe about fundamentals of security, hacking, malware threats and session hijacking, web server hacking and attacks</p> <p>CO2[K2]: explain about security, hacking, malware threats and session hijacking, web server hacking and attacks</p> <p>CO3[K3]: write about hacking, malware threats and session hijacking, web server hacking and attacks</p> <p>CO4[K4]: analyse security fundamentals, hijacking</p> <p>CO5[K5]: assess the various security threats, hacking, malware threats and session hijacking</p>
46.	23UCY064	Elective Courses Generic/ Discipline Specific -VIII: Database Security	<p>CO1[K1]: describe the various database security issues</p> <p>CO2[K2]: explain the concepts of database security</p> <p>CO3[K3]: write about security models, software security design, various models of new generation security design</p> <p>CO4[K4]: analyze security models, software security design, various models of new generation security design</p> <p>CO5[K5]: assess security models and software security design</p>
47.	23UCYS6P	Skill Enhancement Course - IX: Professional Competency Skill: Enterprise Resource	<p>CO1[K2]: show the basic concepts of ERP.</p> <p>CO2[K3]: apply different technologies used in ERP</p> <p>CO3[K4]: analyze different ERPs</p> <p>CO4[K5]: evaluate the benefits of ERP</p> <p>CO5[K6]: create a simple module in ERP.</p>



48.	-	Extension	<p>CO1 [K1]: recognize the importance of community service through training and education</p> <p>CO2 [K2]: interpret ecological concerns, consumer rights, gender issues & legal protection</p> <p>CO3 [K3]: develop team spirit, verbal/nonverbal communication and organizational ethics by participating in community service</p> <p>CO4 [K4]: examine the necessity of professional skills & community-oriented services for a holistic development</p> <p>CO5 [K6]: create awareness on human rights, legal rights, First Aid,</p>
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