PERIYAR UNIVERSITY

PERIYAR PALKALAI NAGAR

SALEM – 636011

B.Sc. COMPUTER SCIENCE

CHOICE BASED CREDIT SYSTEM

OBE REGULATIONS AND SYLLABUS

(SEMESTER PATTERN)

(For Candidates admitted in the Colleges affiliated to Periyar University from 2021 - 2022 onwards)

Outcome Based Education (OBE) REGULATIONS AND SYLLABUS

(With effect from the academic year 2021-2022 onwards)

1. PREAMBLE

The programme prepares under Graduates in **Computer Science** with strong theoretical inputs and practical knowledge, who can be employed in industries. The programme develops requisite professional skills and problem solving abilities to pursue a successful career in software industry and for pursuing higher studies in Computer Science.

2. GRADUATE ATTRIBUTES

1. Computational Knowledge
2. Problem Analysis & Solving
3. Design & Development of Solutions
4. Modern Tool Usage
5. Communication skills
6. Innovation & Entrepreneurship
7. Societal & Environmental concern

3. PROGRAMME SPECIFIC QUALIFICATION ATTRIBUTES

The programme specific qualification attributes meant to be achieved through subjects in the programme in terms of

1. Knowledge and understanding level (K1 and K2)
2. Application level (K3)
3. Analytical level (K4)
4. Evaluation capability level (K5)
5. Scientific or Synthesis level (K6)

4. FOR ADMISSION

A candidate who has passed in Higher Secondary Examination with Mathematics or Business Mathematics or Computer Science or Statistics (Academic stream or Vocational stream) as one of the subject under Board of Higher Secondary Examination, Tamil Nadu as per the norms set by the Government of Tamil Nadu or an Examination accepted as equivalent thereto by the syndicate, subject to such other conditions as may be prescribed , are permitted to appear and qualify for the **Bachelor of Science in Computer Science** degree examination of this university, after a programme of study of three academic years.

5. PROGRAMME OBJECTIVES AND OUTCOMES

1. Programme Educational Objectives (PEOs)

PEO1: Graduates are prepared to be employed in IT industries by providing expected domain Knowledge.

PEO2: Graduates are provided with practical training, hands-on to meet the industrial needs.

PEO3: Graduates are motivated in career and entrepreneurial skill development to become global leaders.

PEO4: Graduates are trained to demonstrate creativity, develop innovative ideas and. to work in teams to accomplish a common goal.

PEO5: Graduates are trained to address social issues and guided to approach problems with solutions.

2. Programme Specific Outcomes(PSOs)

After completion of the programme, the graduates will be able to

PSO1 : Apply domain knowledge and problem solving skills to solve real time problems.

PSO2: Acquire good employability skills which will ensure exceptional career opportunities in IT companies.

PSO3: Get a strong foundation to purse higher education in the field of Computer Science/Applications.

3. Programme Outcomes(POs)

After completion of the programme, the graduates will be able

PO1: To understand the fundamental concepts of computer system, including hardware and software.

PO2: To Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.

PO3: To apply the appropriate technologies, skills and tools in various fields of Computer Science.

PO4: To analyze impacts of computing on individuals, organization and society.

6. DURATION OF THE PROGRAMME

The programme shall extend over a period of three years comprising six semesters with two semesters in one academic year. There shall not be less than 90 working days for each semester. Examination shall be conducted at the end of every semester for the respective subjects.

7. COURSE OF STUDY

The programme of study shall comprise instruction in the following subjects according to the syllabus and books prescribed from time to time. The syllabus for various subjects shall be clearly demarcated into five units in each subject. Part -I, Part-II, Part- III, Part -IV and Part-V subjects are prescribed in the scheme of examination. The Extension Activities are a must for each student to take part at least in any one of the activities such as NSS, YRC, SPORTS and RRC for the fulfillment of the degree.

8. EXAMINATIONS

The theory examination shall be three hour duration for each paper at the end of every semester. The candidate failing in any subject(s) will be permitted to appear in the subsequent examination. The practical examinations for core subjects and SBEC should be conducted at the end of the every semester.

Submission of record note books for practical examinations

Candidates appearing for practical examinations should submit bonafide Record note books prescribed for practical examinations, Otherwise the candidates will not be permitted to appear for the practical examinations. However, in genuine cases of the students who could not submit the record note books, they may be permitted to appear for the practical examinations, provided the concerned Head of the Department certify that the candidate has performed the experiments prescribed for the course. For such candidates zero (0) marks will be awarded for record note books.

9. Revision of Regulations and Curriculum

The University may revise/amend/ change the Regulations and Scheme of Examinations, as and when found necessary.

10 . PASSING MINIMUM

(a) Theory

The candidate shall be declared to have passed the examination if the candidate **secures not less than 40marks** put together out of 100 marks (**CIA+EA). Minimum 40% should be secured (30 out of 75) in EA** of each theory subject**.**

(b) Practical/Project viva voce

The candidate shall be declared to have passed the examination if the candidate **secures not less than 40marks** put together out of 100 marks (**CIA + EA). Minimum 40% should be secured (24 out of 60) in EA** of each Practical subject.

11. Marks Distribution and Question Paper Pattern for B.Sc.,

Theory –Marks Distribution

Maximum Marks : 100 Marks

External [EA] : 75 Marks

Internal [CIA] : 25 Marks

(a). Theory - Question Paper Pattern [External] (Total Marks: 75)

Section	Approaches	Mark Pattern
A	One word (Answer all questions &Three questions from each unit)	15X1 = 15 (Multiple Choice Questions)
B	100 to 200 words (Answer any Two out of five questions & One question from each unit)	2X5 = 10 (Analytical type questions)
C	500 to 1000 words(Answer ALL questions & One question from each unit with Internal Choice)	5X10 = 50 (Essay type questions)

(b). **Theory - Internal Marks Distribution** (Total Marks: 25)

Attendance : 5 Marks

Assignment : 5 Marks

Test : 15 Marks

Practical – Marks Distribution

Maximum Marks : 100 Marks

External [EA] : 60 Marks

Internal [CIA] : 40 Marks

(a) practical-External marks distribution (Total Marks :60)

For each practical question the marks should be awarded as follows **(External)**

i) Algorithm/flowchart - 20%
ii) Writing the program in the main answer book - 30%
iii) Test and debug the program - 30%
iv) Printing the correct output - 20%

(Marks may be proportionately reduced for the errors committed in each of the above)

Practical Question Paper Pattern

Student should attend two questions (either / or pattern)

Note:

(i) Practical I to Practical VII and SBEC Practical have the same pattern

(ii) Core and SBEC Practical Examination must be conducted at the end of every Semester

(b). Practical - Internal Marks Distribution (Total Marks: 40)

- Record : 15 Marks
- Internal Practical examinations : 25 Marks

11.3 Project Evaluation:

Continuous Internal Assessment	: 40 Marks
Evaluation (External)	: 40 Marks
Viva-voce (jointly)	: 20 Marks

12. COMMENCEMENT OF THIS REGULATION :

These regulations shall take effect from the academic year 2021-2022, i.e, for students who are to be admitted to the first year of the programme during the academic year 2021-2022 and thereafter.

Scheme of Examinations from the Academic Year 2021-2022

Credit Distribution as per the University Norms.

SEMESTER	I	II	III	IV	V	VI	Total Credits
PART – I	3	3	3	3	-	-	12
PART – II	3	3	3	3	-	-	12
ALLIED	4	6	4	6	-	-	20
CORE THEORY	5	10	9	4	12	5	45
CORE PRATICAL	2	2	2	2	4	8	20
ELECTIVE	-	-	-	-	4	8	12
SBEC	-	-	3	3	3	3	12
NMEC	-	-	2	2	-	-	4
EVS	-	-	-	-	-	-	-
VALUE EDUCATION	2	-	-	-	-	-	2
ADD-ON COURSE	-	-	-	-	-	-	-
EXTENSION ACTIVITY	-	-	-	-	-	1	1
PROFESSIONAL ENGLISH-PHYSICAL SCIENCE	4	4					8
Cumulative Total Credits	**23**	**28**	**26**	**23**	**23**	**25**	**148**

COURSE OF STUDY AND SCHEME OF EXAMINATION

SEM	PART	SUB CODE	TITLE OF THE SUBJECT	Hrs.		CREDIT	MARKS		
				Lect.	Lab		CIA	EA	TOTAL
SEMESTER – I									
I	I	21UFTA01	Tamil I	6	-	3	25	75	100
	II	21UFEN01	English I	6	-	3	25	75	100
	III	21UCS01	Core I: Problem Solving Through C	6	-	5	25	75	100
	III	21UCSP01	Practical I: C Programming	-	3	2	40	60	100
	III		Allied I	7	-	4	25	75	100
	IV	21UVE01	Value Education	2	-	2	25	75	100
	IV		Professional English- Physical Science I	4	-	4	25	75	100
			Total	**31**	**3**	**23**	**190**	**510**	**700**
SEMESTER – II									
II	I	21UFTA02	Tamil II	6	-	3	25	75	100
	II	21UFEN02	English II	6	-	3	25	75	100
	III	21UCS02	Core II : Data Structure and Algorithms	3	-	5	25	75	100
	III	21UCSP02	Practical II : Data Structure Using C	-	3	2	40	60	100
	III	21UCS03	Core III: Computer Organization and Architecture	4	-	5	25	75	100
	III		Allied II	5	-	4	25	75	100
	III		Allied – Practical	-	2	2	40	60	100
	IV	21UES01	Environmental Studies	1	-	-	25	75	100
	IV		Professional English- Physical Science II	4	-	4	25	75	100
			Total	**29**	**5**	**28**	**255**	**645**	**900**
SEMESTER – III									
III	I	21UFTA03	Tamil – III	6	-	3	25	75	100
	II	21UFEN03	English – III	6	-	3	25	75	100
	III	21UCS04	Core IV: Relational Database Management Systems	3	-	5	25	75	100
	III	21UCSP03	Practical III: SQL and PL / SQL	-	2	2	40	60	100
	III	21UCS05	Core V: Computer Network	3	-	4	25	75	100
	III		Allied III	6	-	4	25	75	100
	III		Allied -Practical	-	-	-	-	-	-
	IV	21UCSSP01	SBEC-I : Office Automation Lab	-	2	3	40	60	100
	IV	NMEC-1	Non -Major Elective Course – I	2	-	2	25	75	100
			Total	**26**	**4**	**26**	**230**	**570**	**800**

SEM	PART	SUB CODE	TITLE OF THE SUBJECT	Hrs.		CREDIT	MARKS		
				Lect.	Lab		CIA	EA	TOTAL
SEMESTER – IV									
IV	I	21UFTA04	Tamil – IV	6	-	3	25	75	100
	II	21UFEN04	English – IV	6	-	3	25	75	100
	III	21UCS06	Core VI : Programming in Java	4	-	4	25	75	100
	III	21UCSP04	Practical IV: Java programming	-	3	2	40	60	100
	III		Allied IV	5	-	4	25	75	100
	III		Allied -Practical Lab	-	2	2	40	60	100
	IV	21UCSSP02	SBEC - II : Image Editing Tool	-	2	3	40	60	100
	IV	NMEC-2	Non -Major Elective – II	2	-	2	25	75	100
	IV	Add-on	Add-on Course Internship Programme	-	-	-	-	-	-
			Total	**23**	**7**	**23**	**245**	**555**	**800**
SEMESTER – V									
V	III	21UCS07	Core VII: Operating Systems	5	-	4	25	75	100
	III	21UCS08	Core VIII: Web Technology	5	-	4	25	75	100
	III	21UCSP05	Practical V : Web Technology Lab	-	3	2	40	60	100
	III	21UCS09	Core IX: Linux and Shell Programming	5	-	4	25	75	100
	III	21UCSP06	Practical VI : Shell Programming	-	4	2	40	60	100
	III	21UCSE01 /02/03	Elective – I	5	-	4	25	75	100
	IV	21UCSSP03	SBEC III-Mobile Application Development Lab	-	3	3	40	60	100
			Total	**20**	**10**	**23**	**220**	**480**	**700**
SEMESTER – VI									
VI	III	21UCS10	Core X: Programming in Python	6	-	5	25	75	100
	III	21UCSP07	Practical VII : Python Programming	-	4	3	40	60	100
	III	21UCSPR01	Mini Project	-	5	5	40	60	100
	III	21UCSE04 /05/06	Elective-II	6	-	4	25	75	100
	III	21UCSE07 /08/09	Elective-III	6	-	4	25	75	100
	IV	21UCSS01	SBEC IV- Quantitative Aptitude	3	-	3	25	75	100
	V	21UEX01	Extension Activities	-	-	1	-	-	-
			Total	**21**	**9**	**25**	**180**	**420**	**600**

Practical Examination should be conducted in the same semester

Subject Title	**PRACTICAL I : C-PROGRAMMING**	**Semester**	**I**
Subject Code	**21UCSP01**	**Specialization**	**NA**
Type	**Core: Practical**	**L:T:P:C**	**45:0:3:2**

COURSE OBJECTIVE:

1. To impart Practical Training in C Programming Language.
2. Familiarize the different control and decision making statements in –C‖.
3. Build programs using arrays and strings.
4. Provide knowledge on working with files and functions.

LIST OF PROGRAMS

1. Develop a C program to print prime numbers within the range of integers given. .
2. Develop a C Program to find the sum and average of given N numbers.
3. Develop a C Program using all decision making and looping statements.
4. Develop a C Program to arrange the given numbers in ascending /descending order.
5. Develop a C Program to perform matrix multiplication.
6. Develop a C Program to manipulate string functions.
7. Develop a C Program to find the Fibonacci series for a give number using recursive function.
8. Develop a C Program to show Call by Value and Call by Reference.
9. Develop a C program to swap two numbers using pointers.
10. Develop a C Program to update the student's details using various file modes.
11. Develop a C Program to copy the content of one file to another file.

COURSE OUTCOME:

1. Study all the Basic Statements in C Programming.
2. Practice the usage of branching and looping statements.
3. Apply string functions and arrays usage.
4. Analysis the use of pointers and files.

Subject Title	**DATA STRUCTURES USING C**	**Semester**	**II**
Subject Code	**21UCSP02**	**Specialization**	**NA**
Type	**Core: Practical**	**L:T:P:C**	**45:0:3:2**

COURSE OBJECTIVE:

1. To impart Practical Training in C Programming Language.
2. Understanding the data structures stack and queues.
3. Apply linked list for other data structures.
4. Analyze the sorting and file organizations.

LIST OF PROGRAMS:

1. Write a C program to create two array list of integers. Sort and store the elements of both of them in third list.
2. Write a C program to multiply two matrices A and B and store the resultant matrix in C using arrays.
3. Write a C program to experiment the operation of STACK using array.
4. Write a C program to create menu driven options to implement QUEUE to perform the following
   (i) Insertion (ii) Deletion (iii) Modification (iv) Listing of elements
5. Write a C program to create Linked list representations of employee records and do the following operations using pointers.
   (i) To add a new record.
   (ii) To delete an existing record.
   (iii) To print the details about an employee.
   (iv) To find the number of employees in the structure.
6. Write a C Program to count the total nodes of the linked list and to insert an element at the end of the linked list.
7. Write a C program to insert an element at the beginning of a doubly linked list.
8. Write a C program to display the hash table, using the mid square method.
9. Write a C program to traverse the given binary tree using all traversal methods.
10. Write a C program to insert an element in a binary tree.

COURSE OUTCOME:

1. Study all the Basic operation of matrices and stack.
2. Practice the usage of branching and looping statements in hash table.
3. Apply arrays for stack and queue.
4. Analysis the use of pointers for linked list, doubly linked list and tree traverse.

Subject Title	**PRACTICAL III – SQL and PL/SQL**	**Semester**	**III**
Subject Code	**21UCSP03**	**Specialization**	**NA**
Type	**Core: Practical**	**L:T:P:C**	**30:0:2:2**

COURSE OBJECTIVE:

1. To impart Practical Training in DDL Commands.
2. Familiarize the different DML Commands.
3. Build queries with SQL Commands.
4. Provide knowledge on working with big tables.

LIST OF PROGRAMS:

NOTE : Demonstrate the following SQL commands and can take any back end RDBMS system for implementation purpose.

1. Data Definition of Base Tables.
2. DDL with Primary key constraints.
3. DDL with constraints and verification by insert command.
4. Data Manipulation of Base Tables and Views.
5. Demonstrate the Query commands.
6. Write a PL/SQL code block that will accept an account number from the user and debit an amount of Rs. 2000 from the account if the account has a minimum balance of 500 after the amount is debited. The Process is to fired on the Accounts table.
7. Write a PL/SQL code block to calculate the area of the circle for a value of radius varying from 3 to 7. Store the radius and the corresponding values of calculated area in a table Areas. Areas – radius, area.
8. Write a PL/SQL block of code for reversing a number. (Example : 1234 as 4321).
9. Create a transparent audit system for a table Client_master (client_no, name, address, Bal_due). The system must keep track of the records that are being deleted or updated. The functionality being when a record is deleted or modified the original record details and the date of operation are stored in the audit client(client_no, name, bal_due, operation, user-id, opdate) table, then the delete or update is allowed to go through.

COURSE OUTCOME:

1. Study all the Basic DDL and DML Commands.
2. Practice the usage of SQL Statements.
3. Apply PL/SQL code usage.
4. Analysis the use of PL/SQL for complex problems.

Subject Title	SBEC I - OFFICE AUTOMATION LAB	Semester	III
Subject Code	21UCSSP01	Specialization	NA
Type	SBEC: Practical	L:T:P:C	30:0:2:3

COURSE OBJECTIVE:

1. To acquire knowledge on editor, spread sheet and slide preparation.
2. To improve creative thinking in presentation software.

LIST OF PROGRAMS:

I. MS-WORD

1. Text Manipulation: Write a paragraph about your institution and Change the font size and type, Spell check, Aligning and justification of Text.
2. Bio data: Prepare a Bio-data.
3. Find and Replace: Write a paragraph about yourself and do the following. Find and Replace - Use Numbering Bullets, Footer and Headers.
4. Tables and manipulation: Creation, Insertion, Deletion (Columns and Rows). Create a mark sheet.
5. Mail Merge: Prepare an invitation to invite your friends to your birthday party. Prepare at least five letters.

II. MS-EXCEL

1. Data sorting-Ascending and Descending (both numbers and alphabets).
2. Mark list preparation for a student.
3. Individual Pay Bill preparation.
4. Invoice Report preparation.
5. Drawing Graphs. Take your own table.

III. MS-POWERPOINT

1. Create a slide show presentation for a seminar.
2. Preparation of Organization Charts.
3. Create a slide show presentation to display percentage of marks in each semester for all students
   (1) Use bar chart (X-axis: Semester, Y-axis: % marks).
   (2) Use different presentation template different transition effect for each slide.

CO Number	CO Statement	Knowledge Level
CO1	Remember the concept of word processing.	K1
CO2	Understanding the tools in Micro soft word.	K2
CO3	Understand and Apply Excel Features.	K3
CO4	Evaluate the EXCEL functions.	K3,K4
CO5	Analyze the different designs of MS Presentations.	K5

Subject Title	**PRACTICAL IV- JAVA PROGRAMMING**	**Semester**	**IV**
Subject Code	**21UCSP04**	**Specialization**	**NA**
Type	**Core: Practical**	**L:T:P:C**	**45:0:3:2**

COURSE OBJECTIVE:

1. To impart Practical Training in JAVA Programming Language.
2. Familiarize the different control and decision making statements in JAVA.
3. Build programs using Packages.
4. Provide knowledge on working with Exception handling functions.

LIST OF PROGRAMS:

1. Write a program to find the Area of Square, Rectangle and Circle using Method Overloading.
2. Write a program to sort the list of numbers using Command Line Arguments.
3. Write a program to multiply the given two matrices.
4. Write a program to design a class to represent a bank account. Include the following:

   Data Members: Name of the depositor, Account number, Type of account, and Balance amount in the account.

   Methods: To assign initial values, To deposit an amount, To withdraw an amount after checking balance, and To display the name and balance.
5. Write a program that import the user defined package and access the Member variable of classes that contained by Package.
6. Write a program to handle the Exception using try and multiple catch blocks.
7. Write a program to illustrate the use of multi threads.
8. Write a program to create student registration form using applet with Name, Address, Sex, Class, Email-id.
9. Write a program to draw the line, rectangle, oval, text using the graphics method.
10. Write a program to create a sequential file that could store details about five products. Details include product code, cost, and number of items available and are provided through the keyboard. Compute and print the total value of all the five products

COURSE OUTCOME:

1. Study all the Basic Statements in java Programming.
2. Practice the usage of branching and looping statements.
3. Apply Packages and Interfaces.
4. Analysis the use of graphics tools in JAVA.

Subject Title	**SBEC II : IMAGE EDITING TOOL**	**Semester**	**IV**
Subject Code	**21UCSSP02**	**Specialization**	**NA**
Type	**SBEC: Practical**	**L:T:P:C**	**45:0:3:3**

COURSE OBJECTIVE:

1. To impart Practical Training in PHOTOSHOP image editing Tool.
2. Familiarize the different text and filter effects.
3. Build programs using stamp tools.
4. Provide knowledge on working with several layouts.

LIST OF PROGRAMS:

1. Design a greeting card for birthday using different text effects.
2. Apply various filter effects to an image.
3. Design the front page of the college calendar using gradient.
4. Create a pattern using pattern stamp tool and clone stamp tool.
5. Design a web page layout.
6. Design a bunch of flowers.
7. Perform/Simulate Plastic Surgery on any part of the face.
8. Create See-through texts
9. Convert Black and White Photo to Color Photo
10. Fill a text with an appropriate image (Example: The word –Flower‖ should be filled with some flower image.)

COURSE OUTCOME:

1. Study all the Basic tools in Photo Shop.
2. Practice the usage of web page creation and useable objects.
3. Apply various effects on image.
4. Analysis the use of coloring on images.

Semester IV: Add-on Course
Internship Programme

OBJECTIVES:

- To make students acquire practical knowledge by going to a company and learn in a live environment
- To make students learn team work and work ethics
- To make students to know the recent trends in Web/Mobile Application Development, Networking or any other area relevant to their study
- To make students analyze their skills and interests
- To help students examine academic and career goals

OUTCOME:

At the end of this internship programme the students will be able to

- apply theory to real life
- work as a part of team
- learn from the company experts
- learn latest trending technologies
- come out with a high morale
- enrich CV

About the internship programme: The internship programme provides students with practical, real-world experience and a valuable complement to their academic training. It enhances the students' skills in problem solving by making him/her work in a live environment in which systematic problem solving methods are practised.

Duration: Internship requires students to spend a minimum of 15 days (during vacation) employed, full-time, as IT interns or trainees during vacation at the end of fourth semester. During this period, they are engaged in work of direct relevance to their programme of study.

Areas: Some of the fields that are open to students include:

- Online Publishing and Editing
- Online Advertising
- Web / Mobile Application Development
- E-Marketing / Online Marketing
- Any other field related to Computer Science / Applications / Information Science

Certificate: A certificate is to be obtained from the organization in which the student undergoes internship programme. This certificate is to be submitted to the college within fifteen days after the college reopens for the next semester.

Credits: The Internship programme does not carry any credit.

Subject Title	**PRACTICAL V : WEB TECHNOLOGY LAB**	**Semester**	**V**
Subject Code	**21UCSP05**	**Specialization**	**NA**
Type	**Core: Practical**	**L:T:P:C**	**45:0:3:2**

COURSE OBJECTIVE:

1. To impart Practical Training in Control panel tools.
2. Familiarize with HTML Tags.
3. Build programs using Java script.
4. Provide knowledge on working with events and methods.

LIST OF PROGRAMS:

1. Create a form having number of elements (Textboxes, Radio buttons, Checkboxes, and so on). Write JavaScript code to count the number of elements in a form.
2. Create a HTML form that has number of Textboxes. When the form runs in the Browser fill the Text boxes with data. Write JavaScript code that verifies that all textboxes has been filled. If a textboxes has been left empty, popup an alert indicating which textbox has been left empty.
3. Develop a HTML Form, which accepts any Mathematical expression. Write JavaScript code to Evaluates the expression and Displays the result.
4. Create a page with dynamic effects. Write the code to include layers and basic animation.
5. Write a JavaScript code to find the sum of N natural Numbers. (Use user-defined function).
6. Write a JavaScript code block using arrays and generate the current date in words, this should include the day, month and year.
7. Create a form for Student information. Write JavaScript code to find Total, Average, Result and Grade.
8. Create a form for Employee information. Write JavaScript code to find DA, HRA, PF, TAX, Gross pay, Deduction and Net pay.
9. Create a form consists of a two Multiple choice lists and one single choice list
   (a)The first multiple choice list, displays the Major dishes available.
   (b) The second multiple choice list, displays the Starters available.
   (c)The single choice list, displays the Soft drinks available.

COURSE OUTCOME:

1. Study all the Basic tools.
2. Practice the usage of web page creation and useable objects.
3. Apply various effects on webpage.
4. Analysis the use of java script and html code.

B.Sc-Computer Science Syllabus under CBCS Pattern with effect from 2021-2022 Onwards

Subject Title	PRACTICAL IV : SHELL PROGRAMMING	Semester	V
Subject Code	21UCSP06	Specialization	NA
Type	Core: Practical	L:T:P:C	60:0:4:2

COURSE OBJECTIVE:

1. To impart Practical Training in file commands.
2. Familiarize with shell script for system configuration.
3. Build programs using filter commands.
4. Provide knowledge on working with simple programs with shell script.

LIST OF PROGRAMS:

1. Write a shell script to stimulate the file commands: rm, cp, cat, mv, cmp, wc, split, diff.

2. Write a shell script to show the following system configuration:

    - Currently logged user and his log name.
    - Current shell, home directory, Operating System type, current Path setting, current working directory.
    - Show currently logged number of users, show all available shells
    - Show CPU information like processor type, speed
    - Show memory information.

3. Write a Shell Script to implement the following: pipes, Redirection and tee commands.

4. Write a Shell script for displaying current date, user name, file listing and directories by getting user choice.

5. Write a Shell script to implement the filter commands.

6. Write a Shell script to remove the files which has file size as zero bytes.

7. Write a Shell script to find the sum of the individual digits of a given number.

8. Write a Shell script to find the greatest among the given set of numbers using command line arguments.

9. Write a Shell script for palindrome checking.

10. Write a Shell script to print the multiplication table of the given argument using for-loop.

COURSE OUTCOME:

1. Study all the Basic commands.
2. Practice the usage of shell script for system configuration.
3. Apply various effects piping and redirection process.
4. Analysis the use of shell script for simple process.

Subject Title	**SBEC III : MOBILE APPLICATION DEVELOPMENT LAB**	**Semester**	**V**
Subject Code	**21UCSSP03**	**Specialization**	**NA**
Type	**SBEC: Practical**	**L:T:P:C**	**45:0:3:3**

COURSE OBJECTIVE:

1. To impart Practical Training in android developer tools.
2. Build programs using eclipse environment.
3. Provide knowledge on working with simple android apps.

LIST OF PROGRAMS:

1. Sample application about Layouts.
2. Sample application about Internets.
3. Sample application about User Interfaces.
4. Sample application about Animations.
5. Create calculator app in Android.
6. Create sample android Camera Application.
7. Create basic list view demo in Android.
8. Create Google map in Android.

COURSE OUTCOME:

1. Study all the Basic Tools.
2. Practice the usage of control panel objects.
3. Apply various commands for layouts and animations.
4. Analysis the use of SQLite I.

Subject Title	**PYTHON PROGRAMMING**	**Semester**	**VI**
Subject Code	**21UCSP07**	**Specialization**	**NA**
Type	**Core: Practical**	**L:T:P:C**	**60:0:4:3**

COURSE OBJECTIVE:

1. To impart Practical Training in basic python statements.
2. Familiarize with control flow tools.
3. Build programs using data structure concepts.
4. Provide knowledge on working with exception and string handling.

LIST OF PROGRAMS:

1. Create a simple calculator to do all the arithmetic operations.
2. Write a program to use control flow tools like if.
3. Write a program to use for loop.
4. Data structures
    a. use list as stack.
    b. use list as queue.
    c. tuple, sequence.
5. Create new module for mathematical operations and use in your program.
6. Write a program to read and write files, create and delete directories.
7. Write a program with exception handling.
8. Write a program using classes.
9. Connect with MySQL and create address book.
10. Write a program using string handling and regular expressions.

COURSE OUTCOME:

1. Study all the Basic commands.
2. Practice the usage of control flow statements.
3. Apply various commands in files and directories.
4. Analysis the use of MYSQL to connect database.

PRACTICAL – VIII MINI PROJECT III YEAR / VI SEM

OBJECTIVES:

The aim of the mini project is that the student has to understand the real time software development environment. The student should gain a thorough knowledge in the problem and language / software which he/she has selected for their project work.

Project Planning:

B.Sc (Computer Science / Information Science)/BCA Mini Project is an involved exercise, which has to be planned well in advance. The topic should be chosen in the beginning of final year itself. Related reading training and discussions of project should be completed in the first term of final year.

I Selection of Team

To meet the stated objectives, it is imperative that mini project is done through a team effort. Though it would be ideal to select the team members at random and this should be strongly recommended, due to practical consideration students may also be given the choice of forming themselves into teams with Two members. A team leader shall be selected. Team shall maintain the minutes of meeting of the team members and ensure that tasks have been assigned to every team member in writing. Team meeting minutes shall form a part of the project report. Even if students are doing project as groups, each one must independently take different modules of the work and must submit the report.

II Selection of Tools

No restrictions shall be placed on the students in the choice of platform/tools/languages to be utilized for their project work, though open source is strongly recommended, wherever possible. No value shall be placed on the use of tools in the evaluation of the project.

III Project Evaluation:

Continuous Internal Assessment	:	40 Marks
Evaluation (External)	:	40 Marks
Viva-voce (jointly)	:	20 Marks

There shall be a common written examination conducted for all the candidates in each group together for a minimum of 10 minutes.

(i) Requirement Specification of Project
(ii) Design of Project
(iii) Testing and Implementation of Project

IV REGULATIONS OF PROJECT WORK

- Three copies of the project report must be submitted by each student..
- The final outer dimensions of the project report shall be 21cm X 30 cm.
- Only hard binding should be done. The text of the report should be set in 12 pt, Times New Roman, 1.5 spaced.
- Headings should be set as follows: CHAPTER HEADINGS 16 pt, Arial, Bold, All caps, Centered.

- Section Headings 14 pt Bookman old style, Bold, Left adjusted.
- Section Sub-heading 12 pt, Bookman old style.
- Title of figures tables etc are done in 12 point, Times New Roman, Italics, centered.
- Only 1.5 space need be left above a section or subsection heading and no space may be left after them.
- References shall be IEEE format (see any IEEE magazine for detail) While doing the project keep note of all books you refer, in the correct format and include them in alphabetical order in your reference list.
- The Candidate should submit the filled in format as given in Annexure-I to the department for approval during the First Week of December.
- Periodically the project should be reviewed.
- A Sample format is enclosed in Annexure-II.
- Format of the Title page and Certificate are enclosed in Annexure III.
- The students may use power point presentation during their viva voce examination.

ANNEXURE - I

PERIYAR UNIVERSITY

Name of the College :

Programme :

Name of the Student :

Register Number :

Title of the Project Work :

Address of Organization / Institution :

Name of the Internal Guide :

Qualification :

Place :

Date : Signature of Internal Guide

ANNEXURE II

CONTENTS

ANNEXURE III

A. Format of the title page

TITLE OF THE PROJECT WORK

A Project Work submitted in partial fulfillment of

the requirements for the degree of

Bachelor of Science in Computer Science / Information Science

to the

Periyar University, Salem - 11

By

NAME OF THE STUDENT

REG. NO.

College emblem

COLLEGE NAME

(AFFILIATED TO PERIYAR UNIVERSITY)

PLACE with Pin Code

MONTH – YEAR

B. Format of the Certificate

Name and Address of the Internal Guide

Date

CERTIFICATE

This is to certify that the Project Work entitled _____

submitted in partial fulfillment of the requirements of the degree of Bachelor of Science in Computer Sciences to the Periyar University, Salem is a record of bonafide work carried out by .....…… Reg. No. ..... under my supervision and guidance.

Internal Guide

Head of the Department

Date of Viva-voice:

Internal Examiner External Examiner

Subject Title	OFFICE AUTOMATION LAB	Semester	II/IV
Subject Code	21UCSAP01	Specialization	NA
Type	Allied: Practical	L:T:P:C	30:0:2:2

COURSE OBJECTIVE:

1. To enable the students to design and develop the Office applications.
2. To qualify the students working in editor, spread sheet and slide preparation.
3. To improve creative thinking in presentation software.

LIST OF PROGRAMS

I. MS-WORD

1. Text Manipulation: Write a paragraph about your institution and Change the font size and type, Spell check, Aligning and justification of Text.
2. Bio data: Prepare a Bio-data.
3. Find and Replace: Write a paragraph about yourself and do the following. Find and Replace - Use Numbering Bullets, Footer and Headers.
4. Tables and manipulation: Creation, Insertion, Deletion (Columns and Rows). Create a mark sheet.
5. Mail Merge: Prepare an invitation to invite your friends to your birthday party. Prepare at least five letters.

II. MS-EXCEL

1. Data sorting-Ascending and Descending (both numbers and alphabets).
2. Mark list preparation for a student.
3. Individual Pay Bill preparation.
4. Invoice Report preparation.
5. Drawing Graphs. Take your own table.

III. MS-POWERPOINT

1. Create a slide show presentation for a seminar.
2. Preparation of Organization Charts.
3. Create a slide show presentation to display percentage of marks in each semester for all students.
4. Use bar chart (X-axis: Semester, Y-axis: % marks).
5. Use different presentation template different transition effect for each slide.

COURSE OUTCOME:

On successful completion of the course, the students will

1. Understand the features in MS Word.
2. Select and apply worksheet and functions in MS EXCEL.
3. Combine multiple features in MS POWER POINT to prepare presentations.

PERIYAR UNIVERSITY

PERIYAR PALKALAI NAGAR SALEM 636 011

MASTER OF SCIENCE IN COMPUTER SCIENCE

SEMESTER PATTERN

Under Choice Based Credit System

REGULATIONS AND SYLLABUS

FOR AFFILIATED COLLEGES

(Effective from the Academic year 2021 - 2022 onwards)

PERIYAR UNIVERSITY

PERIYAR PALKALAI NAGAR SALEM 638 011

Regulations
Effective from the Academic year 2021 - 2022

1. OBJECTIVE OF THECOURSE

To Develop the Post Graduate in Computer Science with strong knowledge of theoretical computer science and who can be employed in research and development units of industries and academic institutions.

2. CONDITION FORADMISSION

A candidate who has passed in B.Sc Computer Science / B.C.A / B.Sc Computer Technology / B.Sc Information Science / B.Sc Information Technology degree of this University or any of the degree of any other University accepted by the syndicate as equivalent thereto subject to such conditions as may be prescribed therefore shall be permitted to appear and qualify for the M. Sc Computer Science degree examination of this University after a course of study of two academicyears.

3. DURATION OF THE COURSE

The programme for the degree of Master of Science in Computer Science shall consist of two Academic years divided into four semesters.

4. EXAMINATIONS

The examination shall be of three hours duration for each course at the end of each semester. The candidate failing in any subject(s) will be permitted to appear in the subsequent examination.

The practical / project should be an individual work. The University examination for practical / project work will be conducted by the internal and external examiners jointly at the end of each semester.

5. STRUCTURE OF M. Sc (Computer Science) PROGRAMME UNDER CBCS PATTERN FOR AFFILIATED COLLEGES

CURRICULUM AND SCHEME OF EXAMINATIONS

Courses	Number of Credits	Hours Per Week	Exam Duration (Hrs.)	Marks		
				CIA	EA	Total
Semester-I						
Core Course-I- Design and Analysis of Algorithms	4	4	3	25	75	100
Core Course-II- Distributed Operating System	4	4	3	25	75	100
Core Course-III-Advanced Java Programming	4	4	3	25	75	100
Core Course-IV- Internet of Things	4	4	3	25	75	100
Elective Course – I	4	4	3	25	75	100
Core Course-V - Lab - I - Advanced Java Programming Lab	2	5	3	40	60	100
Core Course-VI - Lab - II Algorithms Using C++ Lab	2	5	3	40	60	100
Semester-II						
Core Course-VII-Advanced Web Technology	4	4	3	25	75	100
Core Course - VIII - Complier Design	4	4	3	25	75	100
Core Course - IX-Data Mining	4	4	3	25	75	100
Elective Course II	4	4	3	25	75	100
EDC –I	4	4	3	25	75	100
Core Course-X-Lab – III Web Technology Lab	2	4	3	40	60	100
Core Course - XI-Lab – IV Data Mining Lab	2	4	3	40	60	100
Human Rights	-	2	3	25	75	100*

Courses	Number of Credits	Hours Per Week	Exam Duration (hrs)	Marks		
				CIA	EA	Total
Semester-III						
Core Course - XII - Open Source Computing	4	4	3	25	75	100
Core Course - XIII - Digital Image Processing	4	4	3	25	75	100
Core Course - XIV - Big Data Analytics	4	4	3	25	75	100
Elective Course III	4	4	3	25	75	100
Elective Course IV	4	4	3	25	75	100
Core Course-XV - Digital Image Processing Lab	2	5	3	40	60	100
Core Course-XVI – Mini Project Using Open Source	4	5	3	40	60	100
Add On Course - SWAYAM/MOOC/SOFT SKILL	3					
Semester-IV(Option I)						
Core Course - XVII – Machine Learning	4	5	3	25	75	100
Elective Course V	4	5	3	25	75	100
Core Course-XVII - Project Work and Viva-Voce	8	-	-	50	150	200
Total Core EDC	66			590	1410	2000
Elective	04			25	75	100
Add On Course	20			125	375	500
Human Rights	03			-	-	-
	-			25	75	100*
Grand Total	93			765	1935	2700
Semester-IV(Option II)						
Core Course-XVII - Project Work and Viva-Voce	16	-	-	100	300	400
Total Core EDC	70			615	1485	2100
Elective	04			25	75	100
Add On Course	16			100	300	400
Human Rights	03			-	-	-
	-			25	75	100*
Grand Total	93			765	1935	2700

ELECTIVES

Elective Course–I

Advanced Computer Architecture
Optimizing Techniques
Embedded Systems

Elective Course–II

Soft Computing
Advanced Database Management System
Advanced Computer Networks

Elective Course–III

Object Oriented System Development
Cloud Computing
Artificial Intelligence

Elective Course–IV

WAP and XML
Mobile Computing
Gird Computing

Elective Course–V

Web Services
Wireless Networks
Cryptography and Network Security

EDC-EXTRA DISCIPLINARY COURSE

Students are expected to opt EDC (Non major elective) offered to other departments.

1. Principles of Information Technology
2. Fundamentals of Computers and Communications
3. E-Commerce

CIA – CONTINUOUS INTERNAL ASSESSMENT
EA – EXTERNAL ASSESSMENT

6. EXAMINATIONS

THEORY

EVALUATION OF CONTINUOUS INTERNAL ASSESSMENT

Test	:10 Marks
Seminar	:05 Marks
Assignment	:05 Marks
Attendance	:05 Marks
Total	:25 Marks

(No passing minimum)

EVALUATION OF EXTERNAL ASSESMENT QUESTION PAPER PATTERN

Time: 3 Hours Max. Marks: 75

PART- A: 15x1 = 15 marks
Answer all the questions
Three questions from each unit (Multiple Choice Questions)

PART- B: 2x5 = 10 marks
Answer any TWO questions
One question from each unit

PART- C: 5x10 = 50 marks
Answer all the questions
One question from each unit (either or type)

The Passing minimum shall be 50% out of 75 marks (38 marks)

PRACTICAL / SOFTWARE DEVELOPMENT
EVALUATION OF CONTINUOUS INTERNAL ASSESSMENT

Test1	:	15 Marks
Test2	:	15 Marks
Record	:	10 Marks
Total	:	40 Marks

(Record Note must be compulsorily submitted while attending the Practical Examination and No passing minimum)

EVALUATION OF EXTERNAL ASSESSMENT

I) PRACTICAL

QUESTION PAPER PATTERN

Time: 3Hours Max. Marks:60

There will be two questions with or without subsections to be given for the practical examination. Every question should be chosen from the question bank prepared by the examiner(s).

Distribution of Marks

Each question : 30 Marks Problem Understanding : 05 Marks Program writing : 10 Marks
Debugging : 10 Marks
For Correct Results : 05 Marks

II) SOFTWARE DEVELOPMENT

Viva-voce (jointly) : 30 Marks Modification : 30Marks

Students should write about their software development briefly.

i. Aim
ii. Features
iii. Modules
iv. Modification

III) PROJECT WORK

Continuous Internal Assessment : 50 Marks Evaluation & Viva-Voce (Jointly) : 150Marks

7. REGULATIONS FOR THE PROJECT WORK

- **OPTION – I for IV SEMESTER**
  - Students should do their Project work in the Institution along with one Core Course and one Elective Course
- **OPTION – II for IV SEMESTER**
  - Students should do their Project work in Government/Government Aided / Multinational Company

- **Common instruction for the project work (For both OPTION – I and OPTION – II) of IV SEMESTER**
  - The Candidate should submit the filled in format as given in Annexure-I to the department for approval during the 1st Week of December.
  - Periodically the project should be reviewed.
  - The Student should submit three copies of their Project work.
  - A Sample format is enclosed in Annexure-II.
  - Format of the Title page and Certificate are enclosed in Annexure-III.
  - The students may use power point presentation during their viva voce examination.

8. PASSING MINIMUM

The candidate shall be declared to have passed in the Theory / Practical / Project Work examination, if the candidate secures not less than 50% marks in EA and also in total of the prescribed marks. However submission of a record note book is a must.

9. CLASSIFICATION OF SUCCESSFUL CANDIDATES

Candidates who obtain 75% and above in the aggregate shall be deemed to have passed the examination in **First Class with Distinction** provided they pass all the examinations prescribed for the programme at the first appearance. Candidates, other than the above, who secure not less than 60% of the aggregate marks in the whole examinations, shall be declared to have passed the examination in **First Class**. The remaining successful candidates shall be declared to have passed in **Second Class**.

Candidates who pass all the examinations prescribed for the programme in first instance and within a period of two academic years from the year of admission are only eligible for **University Ranking.**

10. MAXIMUM DURATION FOR THE COMPLETION OF THE PROGRAMME

The maximum duration to complete the programme shall be three academic years after normal completion of the programme.

11. COMMENCEMENT OF THIS REGULATION

These regulations shall take effect from the academic year 2021-22, that is, for students who are admitted to the first year of the programme during the academic year 2021-22 and thereafter.

12. TRANSITORY PROVISION

Candidates who were admitted to the M.Sc., Computer Science programme of study before 2021-2022 shall be permitted to appear for the examinations under those regulations for a period of three years after completion of the programme. Thereafter, they will be permitted to appear for the examination only under the regulations then in force.

ANNEXURE - I

PERIYAR UNIVERSITY

Name of the College :

Programme :

Name of the Student :

Register Number :

Title of the Project Work :

Address of Organization / Institution:

Name of the External Guide :

Designation :

Place :

Date: Signature of External Guide

(With seal)

Name of the Internal Guide :

Qualification :

Teaching Experience :

Place :

Date: Signature of Internal Guide

Principal [Approved or not Approved]

[University Use]

ANNEXURE II

CONTENTS

ANNEXURE III

A. Format of the title page

TITLE OF THE PROJECT WORK

A Project Work submitted in partial fulfillment of the requirements for the degree of

Master of Science in Computer Science

To the

Periyar University, Salem - 11

By

NAME OF THE STUDENT

REG. NO.

College emblem

COLLEGE NAME

(AFFILIATED TO PERIYAR UNIVERSITY)

Place with Pin Code

MONTH – YEAR

B. Format of the Certificate

Name and Address of the Internal Guide

Place

Date

CERTIFICATE

This is to certify that the Project Work entitled …….....……

…… submitted in partial fulfillment of the requirements of the degree of Master of Science in Computer Sciences to the Periyar University, Salem is a record of bonafide work carried out by .....…… Reg. No. ..... under my supervision and guidance.

Internal Guide

Head of the Department

Date of Viva-Voce:

Internal Examiner External Examiner

SEMESTER I

Core Course-V - Lab – I - ADVANCED JAVA PROGRAMMING LAB

1. Implementation of Multi-threading and Exception handlingconcepts
2. Write a program to read, write and copy a file using bytestreams.
3. Write a program to read, write and copy a file using characterstreams.
4. Develop a programs using AWT to display the personal detail of anemployee.
5. Develop a banking system using Swing.
6. Write a program to handle Mouse and Key events.
7. Implement TCP/IP protocol for message communication.
8. Implement UDP protocol for message communication.
9. Using JDBC develop a student information system.
10. Implement client/server communication using servlets.
11. Develop a web page using JSP.
12. Implementation of RMI.

SEMESTER I

Core Course-VI- 17PCSP02- Lab - II ALGORITHMS USING C++ LAB

1. Apply the Divide and Conquer technique to arrange a set of numbers using Merge Sort method.
2. Perform Strassen's matrix multiplication using Divide and Conquer method.
3. Solve the Knapsack problem using Dynamic Programming.
4. Construct a Minimum Spanning Tree using Greedy method.
5. Perform Warshall's Algorithm using Dynamic Programming.
6. Solve Dijkstra's Algorithm using Greedy Technique.
7. Solve Subset Sum problem using Backtracking
8. Implement the 8-Queens Problem using Backtracking.
9. Implement Knapsack Problem using Backtracking.
10. Find the solution of Traveling Salesperson Problem using Branch and Bound technique.

OBJECTIVES:

SEMESTER II

Core Course - X- Lab – III WEB TECHNOLOGY LAB

1. Create minimum two simple applications using controls. Eg: Calculator, Drawing Pictures using GDI, Animation and Trainer Kit.

2. Create a program to perform validation using validation controls.

3. Develop a website using ADO.Net to implement online Banking with login page, account details, deposit, withdraw, fund transfer and report of transaction with following options –last 10 days, last 1 month, last 6 month, last 1 year.

Note: create menu for navigation and also maintain session that expires after inactive of 5min.

4.Write a simple ASP.NET program to display the following Web Controls:

• A button with text "click me". The button control must be in the center of the form.

• A label with a text hello

• A checkbox.

The form name must be Web Controls.

5.Write an application that simulates sending a SOAP message as a request and receiving another as a response.

6. Develop a web page to insert, update, delete student details using web service for accessing database.

7. Write a simple ASP.NET program using COM component.

8. Write a simple ASP.NET program to check whether a given string is palindrome or not using custom controls.

9. Create a Web Page and add Enable Caching attribute by the concept of Caching in ASP.Net.

10. Write a simple ASP.Net program to perform Form Authentication.

SEMESTER II

Core Course – XI-Lab – IV DATA MINING LAB

Develop **R** Script for the following:

1. To get the input from user and perform numerical operations (MAX, MIN, AVG, SUM, SQRT, ROUND).
2. To perform data import/export (.CSV, .XLS, .TXT) operations using dataframes.
3. To get the input matrix from user and perform Matrix addition, subtraction, multiplication, inverse transpose and division operations using vector concept.
4. To perform statistical operations (Mean, Median, Mode and Standarddeviation).
5. To perform data pre-processing operations
    i) Handling Missing data ii) Min-Maxnormalization
6. To perform dimensionality reduction operation using PCA.
7. To perform Simple Linear Regression and Multi Linear Regression.
8. To perform K-Means clustering operation and visualize it.
9. Write R script to diagnose any disease using KNN classification.
10. To perform market basket analysis using Apriori algorithm.

SEMESTER III

Core Course – XV - Lab – IV DIGITAL IMAGE PROCESSING LAB

1. Choose two grayscale images or RGB images that you will first have to grayscale (with rgb2gray() function) . Display original images and the same images after their **QUANTIZATION** with different number of bits (1 to 8) using MATLAB.

2. Perform Histogram Equalization on a Color image using MATLAB.

3. Using Spatial Domain technique, write a program in MATLAB to perform Smoothening operation in an image.

4. Write a MATLAB code to transform 1-D FIR Filter to 2-D FIR Filter using Frequency Transformation Method. **(FIR-Finite Impulse Response).**

5. Find the Boundaries of Objects within an image by Sobel operator method in MATLAB.

6. Write a MATLAB program to detect the edges within the image and compare the results of both Canny and Prewitt Methods.

7. Write a program to Compress an image using Huffman coding method in MATLAB.

8. Implement Discrete Cosine Transformation method to compress an image using MATLAB.

9. Write a MATLAB code for Image Segmentation to convert to a binary image to improve the legibility of text Using thresholding technique.

10. Compute the Watershed Transform of the Segmentation function in an image at foreground and background marker pixels using Marker-Controlled Watershed Segmentation in MATLAB.

SEMESTER III

Core Course – XVI - Lab – IV MINI PROJECT USING OPEN SOURCE

The student must submit a report to the Guide allotted to them and appear for viva-voce examination. The project report may contain the following:

1. Introduction
2. Data Collection / system study
3. System development
4. Implementation
    - Source code
    - Sample input
    - Sample output
5. Conclusion