FACULTY OF IT & COMPUTER SCIENCE

COURSE CURRICULUM

Course Title: Software Engineering
(Code: SECAM110-1C)

IT and CS Programmes in which this course is offered	Semester in which offered
Bachelor of Computer Applications (BCA)	Fourth Semester

Course Objectives -

 To study pioneer of Software Development Life Cycle, Development models and Agile Softwaredevelopment.

 To study fundamental concepts in software testing, including software testing objectives, process, criteria, strategies and methods.

 To discuss various software testing issues and solutions in software unit test; integration, regressionand system testing.

Teaching and Examination Scheme –

Content Hours per Week			Course Credits		Examination Marks				
L	T	P	T	P	Theory Marks		Practical Marks		150
			3	2	E	M	I	EV	
3	0	2	4		60	40	30	20	

*E - External Examination, M- Mid Semester Examination, I- Internal Submission & Viva, EV - External Viva

DETAILED COURSE CONTENTS -

Sr.	Topic	Teaching Hrs.
1	**INTRODUCTION TO SOFTWARE AND SOFTWARE ENGINEERING** 1. Evolution of software 2. Definition of software 3. Software Characteristics 4. Software Applications	08

	SOFTWARE PROCESS AND PROCESS MODEL 1. Software Engineering as layered technology 2. Waterfall Model 3. Linear Sequential Model 4. Prototyping Model 5. RAD Model 6. Evolutionary Software Process Model 1. Incremental Model 2. Spiral Model	
2	**SYSTEM REQUIREMENT SPECIFICATIONS** 1. An Example: What is the need? 2. Role and Tasks of System Analyst 3. Data Dictionary 4. Feasibility Analysis 5. Data Flow Diagrams 1. Context Diagram 2. Logical Data Flow Diagram 3. Physical Data Flow Diagram	08
3	**SOFTWARE PROJECT PLANNING** 1. Software Scope 2. Resources 3. Estimation Techniques 4. Empirical Estimation Model utsourcing **RISK MANAGEMENT** 1. Risk Strategies 2. Software Risks 3. Risk Identification 4. Risk Projection 5. RMMM Plan	08
4	**SOFTWARE TESTING METHODS** 1. Software Testing Fundamentals 2. Test CASE Design 3. White Box Testing 4. Basis Path Testing 5. Control Structure Testing 6. Black Box Testing 7. Unit Testing 8. Integration Testing 9. Validation Testing 10. System Testing 11. What is CASE?	08

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests(Summative/MCQ) etc.

Revised Bloom's Taxonomy

Distribution of Theory Marks					
Remember	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Create**
07	**07**	**11**	**-**	**-**	**-**

*Legends: R = Remembrance; U = Understanding; A = Application N :Analyze and E :EvaluateC :Create and Above Levels (Revised Bloom's Taxonomy)

SUGGESTED LEARNING RESOURCES

A. List of Books

SR NO.	TITLE OF BOOKS	AUTHOR NAME	PUBLICATION
1	Software Engineering	Somerville	Pearson education PHI
2	Software Engineering	Roger S. Pressman	MGH
3	Fundamentals of Software Engineering	Rajib Mall,	PHI
4	Object Oriented Modeling and design with UML, second edition	Michael R Blaha and James R Rambaugh	Pearson Prentice Hall

B. List of Software/Learning Websites

1. https://www.geeksforgeeks.org/software-engineering/
2. https://www.tutorialspoint.com/software_engineering/
3. https://www.javatpoint.com/software-engineering/
4. Edraw UML Diagram (Tool used to draw UML diagrams)

COURSE OUTCOMES:

Sr. No.	CO statement	Marks % Weightage
CO-1	**To understand software development lifecycles and apply various software process models, including Waterfall, Prototyping, RAD, and Evolutionary models like Incremental and Spiral, to analyze and design software solutions.**	**15**
CO-2	**To elicit, analyze, and document system requirements using various techniques, including data dictionaries, feasibility analysis, and data flow diagrams, to effectively specify system needs.**	**30**
CO-3	**To plan and manage software projects by defining scope, estimating resources and effort, applying risk management strategies, and understanding outsourcing considerations.**	**30**
CO-4	**To understand and apply various software testing methods, including white box, black box, unit, integration, validation, and system testing techniques, along with test case design principles and the use of CASE tools.**	**25**

SUGGESTED LIST OF PRACTICAL/EXERCISES

S.No.	PracticalExercises (Outcomes'inPsychomotorDomain)	Hrs.required
1	Identifythedevelopmentmodelforsoftwarewithproperexplanation	02
2	Gatherrequirementforsoftware.	04

3	PrepareSRSDocumentforSoftware	04
4	DesignActivityDiagramforsystem	02
5	DesignUse-caseDiagramforsystem	02
6	DesignDataDictionaryofsystem	04
7	PrepareE-RDiagramof System	02
8	DesignDataFlowDiagram ofsystem	04
9	PrepareGanttchartofsystem	02
10	Preparesuitabletest caseforsystemtesting.	02

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SWAMINARAYAN UNIVERSITY
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FACULTY OF IT AND COMPUTER SCIENCE

COURSE CURRICULUM

Course Title: COMPUTER ORGANIZATION AND ARCHITECTURE
(Code: MDC103-1C-D)

IT and CS Programmes in which this course is offered	Semester in which offered
Bachelor of Computer Applications-(B.C.A)	Fourth Semester

Course Objectives –

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning out comes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

i. Describe the organization of a computer system in terms of its main components.

ii. Identify various parts of a system memory hierarchy.

iii. Interface digital circuits to microprocessor systems.

iv. Relate design principles in instruction set design including RISC architectures.

Teaching and Examination Scheme –

Content Hours per Week			Course Credits		Examination Marks				
L	T	P	T	P	Theory Marks		Practical Marks		100
			3	2	E	M	I	EV	
3	0	2	4		25	25	25	25	

*E - External Examination, M- Mid Semester Examination, I- Internal Submission & Viva, EV - External Viva

DETAILED COURSE CONTENTS -

Sr.	Topic	Teaching Hrs.
1	**Computer Data Representation** • Basic computer data types, Complements, Fixed point representation, • Register Transfer and Micro-operations: Floating point representation, Register Transfer language, Register Transfer, Bus and Memory Transfers (Tree-State Bus Buffers, Memory	08

	Transfer), Arithmetic MicroOperations, Logic Micro-Operations, Shift Micro-Operations, Arithmetic logical shift unit	
2	**Basic Computer Organization and Design** • Instruction codes, Computer registers, computer instructions, Timing and Control, Instruction cycle, Memory-Reference Instructions, Input-output and interrupt, Complete computer description, Design of Basic computer, Design of Accumulator Unit. **Assembly Language Programming** • Introduction, Machine Language, Assembly Language Programming: Arithmetic and logic operations, looping constructs, Subroutines, I-O Programming. **Micro programmed Control Organization:** • Control Memory, Address sequencing, Micro program example, Design of Control Unit	12
3	**Central Processing Unit** • Introduction, General Register Organization, Stack Organization, Instruction format, Addressing Modes, Data transfer and manipulation, Program control, Reduced Instruction Set Computer (RISC) & Complex Instruction Set Computer (CISC)	14
4	**Computer Arithmetic** • Introduction, Addition and subtraction, Multiplication Algorithms (Booth Multiplication Algorithm), Division Algorithms, Floating Point Arithmetic operations, Decimal Arithmetic Unit. **Memory Organization** • Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory.	14

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

Revised Bloom's Taxonomy

Distribution of Theory Marks					
Remember	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Create**
07	**07**	**11**	**-**	**-**	**-**

*Legends: R = Remembrance; U = Understanding; A = Application N :Analyze andE :EvaluateC :Create and Above Levels (Revised Bloom's Taxonomy)

SUGGESTED LEARNING RESOURCES

A. List of Books

SR NO.	**TITLE OF BOOKS**	**AUTHOR NAME**	**PUBLICATION**
1	Computer Organization, 5th edition,	McGraw Hill	Carl Hamacher, ZvonksVranesic
2	Computer System Architecture	M. Moris Mano	Pearson/PHI, India:

3	Computer Architecture and Organization	John P. Hayes	Tata McGrawHill

B. List of Software/Learning Websites

http://www.ddegjust.ac.in/studymaterial/msc-cs/ms-07.pdf
2.http://www.iitg.ernet.in/asahu/cs222/Lects/3http://www.srmuniv.ac.in/downloads/computer_architecture.pdf

Course Outcomes:

Sr. No.	CO statement	Marks % Weightage
CO-1	**to understand and apply various data representation methods, including fixed-point, floating-point, and complement representations, and perform register transfer and micro-operations within computer systems.**	**20**
CO-2	**to understand the fundamental principles of computer organization and design, including instruction sets, computer arithmetic, control unit design, and assembly language programming.**	**25**
CO-3	**to understand the architecture and functionality of CPU, including register organization, instruction formats, addressing modes, data manipulation, program control, and the differences between RISC and CISC architectures.**	**30**
CO-4	**to understand and apply computer arithmetic operations and memory organization concepts, including various algorithms and memory types.**	**25**

SUGGESTED LIST OF PRACTICAL/EXERCISES

Sr. No	Practical/ Exercises	Approx Hrs. Required
1.	Implement Booth's Algorithm	02
2.	Write the working of 8085 simulator GNUsim8085 and basic architecture of 8085 along with small introduction.	06
3.	Write an assembly language code in GNUsim8085 to store numbers in reverse order in memory location	08
4.	Write an assembly language code in GNUsim8085 to implement arithmetic instruction	02
5.	Write an assembly language code in GNUsim8085 to find the factorial of a number	02
6.	Write an assembly language code in GNUsim8085 to implement logical instructions	08
7.	Design ALU using Logisim.	04
8.	To study Verilog HDL	10

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FACULTY OF IT AND COMPUTER SCIENCE

COURSE CURRICULUM

Course Title: MODERN INDIAN LANGUAGE
(Code: AEC104-1C-E)

IT and CS Programmes in which this course is offered	Semester in which offered
Bachelor of Computer Applications-(B.C.A)	Fourth Semester

Course Objectives –

- Develop basic conversational skills in the target language. Understand and use fundamental grammar and vocabulary. Read and comprehend simple texts in the target language. Write basic sentences and paragraphs in the target language.
- **કોઈ પણ વિદ્યાશાખા કે વિષયના વિદ્યાર્થીઓ ગુજરાતિ સાહિત્યના સૌંદયાનો આસ્વાદ માણી સાહિત્ય પ્રત્યે અભિમુખ થશે,**
- हिन्दी नाटक के बारे में विस्तार से जानकारी देना
- हिन्दी भाषा के व्यवहारिक ज्ञान से अवगत कराना

Teaching and Examination Scheme –

Content Hours per Week			Course Credits		Examination Marks				
			T	P	Theory Marks		Practical Marks		
L	T	P	2	0	E	M	I	EV	50
2	0	0	2		25	25	0	0	

*E - External Examination, M- Mid Semester Examination, I- Internal Submission & Viva, EV - External Viva

DETAILED COURSE CONTENTS -

Sr.	Topic	Teaching Hrs.
1	**કૃતિ – વિનોદ ભટ્ટ - શ્રેષ્ઠ હાસ્યરચનાઓ - સંપા. વિનોદ ભટ્ટ** એકમ - 1. વિનોદ ભટ્ટ - શ્રેષ્ઠ શ્રેષ્ઠ હાસ્યરચનાઓ (સંપા. વિનોદ ભટ્ટ)નો કૃતિલક્ષી અભ્યાસ (પસંદગીની રચનાઓનો અભ્યાસ) **વિનોદ ભટ્ટ - શ્રેષ્ઠ હાસ્યરચનાઓ** **પહેલું સુખ તે મૂંગી નાર**	12

	આંખ આડા કાન **ભૂલચૂક લેવી-દેવી** **અમદાવાદ એટલે અમદાવાદ**	
2	**रचनाकार और रचना का मूल्याांकन** जयशंकर प्रसादः वयक्तित्व और कृतित्व 'ध्रुवस्वामिनी' नाटक का कथानक और उद्देश्य ध्रुवस्वामिनी का चरित्र , रामगुप्त का चरित्र	12

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

SUGGESTED LEARNING RESOURCES

A. List of Books

SR NO.	TITLE OF BOOKS	AUTHOR NAME	PUBLICATION
1	**વિનોદ ભટ્ટ - શ્રેષ્ઠ હાસ્યરચનાઓ** **પહેલું સુખ તે મૂંગી નાર** **આંખ આડા કાન** **ભૂલચૂક લેવી-દેવી** **અમદાવાદ એટલે અમદાવાદ**	**વિનોદ ભટ્ટ**	-
2	'ध्रुवस्वाहमनी' (नाटक)	जयशांकर प्रसाद	ध्रुमिल प्रकाशन, अिमदाबाद

B. List of Software/Learning Websites

https://www.youtube.com/watch?v=seDBeQ_ITdk
https://www.youtube.com/watch?v=kKaGU0kYaq4

Revised Bloom's Taxonomy

Distribution of Theory Marks					
Remember	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Create**
07	**07**	**11**	**-**	**-**	**-**

*Legends: R = Remembrance; U = Understanding; A = Application N :Analyze and E :Evaluate C : Create and Above Levels (Revised Bloom's Taxonomy)

Course Outcomes:

Sr. No.	CO statement	Marks % Weightage
CO-1	• **વિદ્યાર્થીઓ કૃતિ દ્વારા સમાજ અને સંસ્કૃતિને ઓળખી શકશે. વિદ્યાર્થીઓ સપર્ધાત્મક પરીક્ષાની તૈયારીના ભાગરૂપે કેટલીક સાહિત્યિક બાબતો વિશે જાણશે**	**50**
CO-2	**छात्र नाटक के तत्त्व को समझकर अलोचना करना सीखेंगे**	**50**

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FACULTY OF IT AND COMPUTER SCIENCE

COURSE CURRICULUM

Course Title: OFFICE AUTOMATION & IT TOOLS
(Code: SEC104-1C-E)

IT and CS Programmes in which this course is offered	Semester in which offered
Bachelor of Computer Applications-(B.C.A)	Fourth Semester

Course Objectives –

This course gives a practical introduction to the DOS and WINDOWS operatingsystem .It makes the students proficient in the use of MS OFFICE packagesnamely WORD, EXCEL & POWER POINT

Teaching and Examination Scheme –

Content Hours per Week			Course Credits		Examination Marks				
L	T	P	T	P	Theory Marks		Practical Marks		50
			0	2	E	M	I	EV	
0	0	4	2		0	0	25	25	

*E - External Examination, M- Mid Semester Examination, I- Internal Submission & Viva, EV - External Viva

DETAILED COURSE CONTENTS -

Sr.	Topic	Teaching Hrs.
1	**MICROSOFT WORD** • Creating a New Office Document • Creating a Document Using a Wizard or Template • Entering Text • Turning on Paragraph marks on • Opening and Editing Documents • Finding and Replacing Text	12

	• Using Print Layout View, Outline View, Web Layout View • Making Documents Look Great • Changing Font, Font Size, Boldfacing, Italicizing, Underlying, Expanding and Condensing Character spacing, Changing the Case of Text, Using special Font Effects • Selecting Paragraphs, Using the ruler to Indent Paragraphs, Setting a Different First Line Indent, Indent Using paragraph Dialog Box, Double Spacing Paragraphs, Centering and Justifying Paragraphs, Setting tabs, Addling Bullets to Paragraphs, Setting Tabs, Adding bullets to Paragraphs, Numbering Paragraphs • Finding And Replacing Formatting, Using Style, Choosing Text Style, Creating a Paragraph style, Modifying a paragraph Style, Creating a character style • Changing the Page size and Orientation, Changing Margins, Setting up Headers and Footers, Creating Multiple Sections, Paginating the Document, Numbering Pages, Setting up Multiple Columns, Auto Formatting a Document • Creating A tables, Drawing a table, Entering, Aligning, Totaling Data in a Table, Turning on Borders and Shading, Converting Text to Table and vice a versa	
2	**MICROSOFT EXCEL** • Creating New Workbooks and Worksheets • Moving within a sheet, Entering, Editing Cells, Filling an Entry Range, Auto filling a range, Entering a Simple Calculations, Building a Simple Formula, Summing Columns and Rows, Sum Function, Copying Formulas, Average Functions, Function Wizard • Enlarging Columns and Rows, Inserting Rows and Columns, Inserting and Deleting Cells, Moving & Copying Data, Freezing the Headings • Building a Better Worksheet • Enlarging Columns and Rows, Inserting Rows and Columns, Inserting and Deleting Cells, Moving & Copying Data, Freezing the Headings • Making Your Worksheet Look Great • Choosing an AutoFormat, Formatting Text, Centering a Title Above a Range, Formatting numbers, Adding Borders & Shading to Range, Applying Conditional Formatting • From Numbers to Pictures: All About Charts • Creating a Default Chart, Creating a Chart using Chart Wizard, Modifying: Chart, Chart Type, Chart Area, Plot Area, Gridlines, Titles, Axes, Legend, a Data Series • Adding data to a chart, adding data Tables and Trend lines • Extra Special Excel Tricks • Changing to Another Sheet, Naming Sheets, Referring to Data • From Other Sheets in Formulas, Consolidating to a Sheet, Naming Ranges, Auditing a Workbook, Seeking Goals, Tracking Changes, Reviewing Changes, Inserting Comments, Protecting and Sharing a workbook, merging workbooks	12

	• Making a Bill in Excel **MICROSOFT POWERPOINT** • Creating New Presentation • Using Auto content Wizard, Using a Design Template, Using Sample Presentation, Changing Views, Adding Slides • Outlining the Presentation • Creating Text Slides • Making Great Looking Presentation • Selecting new design, Changing Color Scheme, Switching to Slide and Title Master Views, Changing the Background color and shading, Text Fonts, Header and Footer Information, Adding logo to Background, Reordering Slides, Duplicating and deleting Slides. 2.2.2 Drawing shapes, lines, Adding Predefined shapes and Text boxes, Adding Shadows and 3-D Effects, Making text conform to shapes, Grouping and Ungrouping Shapes, Rearranging and Rotating Shapes • Showtime ! Presenting on Paper, In Person and on the Wave • Adding Transition Effects, Adding Preset Animation, Creating Custom Animations, setting up the show, Displaying the Show • Making on Organization Structure in Power Point • Starting an organization chart, Entering names and Titles, Adding Members, Formatting the Boxes, Text and Lines, Rearranging the Org Chart, Finishing the Chart	

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

Revised Bloom's Taxonomy

Distribution of Theory Marks					
Remember	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Create**
07	**07**	**11**	**-**	**-**	**-**

*****Legends: R = Remembrance; U = Understanding; A = Application N :Analyze andE :EvaluateC :Create and Above Levels (Revised Bloom's Taxonomy)

SUGGESTED LEARNING RESOURCES

A. List of Books

SR NO.	TITLE OF BOOKS	AUTHOR NAME	PUBLICATION
1	Microsoft Office for windows ('O' Level DOEACC)	Sagman Pub	Pearson Education ISBN 81-7808-341-8
2	World Wide Web Design with HTML	C. Xavier	TMH
3	Mastering MS OFFICE - 2000 COURTERTECHMEDIA Professional addition	Herbert Schild	-

COURSE OUTCOMES:

Sr. No.	CO statement	Marks % Weightage
CO-1	**Students will be able to create, edit, format, and manage office documents using various tools and techniques.**	**20**
CO-2	**Students will format documents effectively using paragraphs, styles, page layout options, and tables.**	**25**
CO-3	**Students will be able to create, format, and manipulate Excel workbooks, including data entry, calculations, charting, and advanced features like consolidation and protection.**	**30**
CO-4	**Students will be able to create, format, and present effective PowerPoint presentations, including organizational charts, using various design and animation techniques.**	**25**

SUGGESTED LIST OF PRACTICAL/EXERCISES

Sr. No	Practical/ Exercises	Approx Hrs. Required
1.	• Creating a New Office Document • Creating a Document Using a Wizard or Template • Opening and Editing Documents Finding and Replacing Text Using Print Layout View, Outline View, Web Layout View • Changing Font, Font Size, Boldfacing, Italicizing, Underlying, Expanding and Condensing Character spacing, Changing the Case of Text, Using special Font Effects • Changing Font, Font Size, Boldfacing, Italicizing, Underlying, Expanding and Condensing Character spacing, Changing the Case of Text, Using special Font Effects	08
2.	• Selecting Paragraphs, Using the ruler to Indent Paragraphs, Setting a Different First Line Indent, Indent Using paragraph Dialog Box, Double Spacing Paragraphs, Centering and Justifying Paragraphs, Setting tabs, Addling Bullets to Paragraphs, Setting Tabs, Adding bullets to Paragraphs, Numbering ParagraphS. • Finding And Replacing Formatting, Using Style, Choosing Text Style, Creating a Paragraph style, Modifying a paragraph Style, Creating a character style. • Changing the Page size and Orientation, Changing Margins, Setting up Headers and Footers, Creating Multiple Sections, Paginating the Document, Numbering Pages, Setting up Multiple Columns, Auto Formatting a Document. • Creating A tables, Drawing a table, Entering, Aligning, Totaling Data in a Table, Turning on Borders and Shading, Converting Text to Table and vice a versa	08
3.	• Creating New Workbooks and Worksheets • Moving within a sheet, Entering, Editing Cells, Filling an Entry Range, Auto filling a range, Entering a Simple Calculations, Building a Simple Formula, Summing Columns and Rows, Sum Function, Copying Formulas, Average Functions, Function Wizard • Enlarging Columns and Rows, Inserting Rows and Columns,	18

	Inserting and Deleting Cells, Moving & Copying Data, Freezing the Headings • Building a Better Worksheet Enlarging Columns and Rows, Inserting Rows and Columns, Inserting and Deleting Cells, Moving & Copying Data, Freezing the Headings • Making Your Worksheet Look Great Choosing an AutoFormat, Formatting Text, Centering a Title Above a Range, Formatting numbers, Adding Borders & Shading to Range, Applying Conditional Formatting • From Numbers to Pictures: All About Charts Creating a Default Chart, Creating a Chart using Chart Wizard, Modifying: Chart, Chart Type, Chart Area, Plot Area, Gridlines, Titles, Axes, Legend, a Data Series • Adding data to a chart, adding data Tables and Trend lines • Extra Special Excel Tricks Changing to Another Sheet, Naming Sheets, Referring to DataFrom Other Sheets in Formulas, Consolidating to a Sheet, Naming Ranges, Auditing a Workbook, Seeking Goals, Tracking Changes, Reviewing Changes, Inserting Comments, Protecting and Sharing a workbook, merging workbooks • Making a Bill in Excel	
4.	• Creating New Presentation • Using Auto content Wizard, Using a Design Template, Using Sample Presentation, Changing Views, Adding Slides • Outlining the Presentation Creating Text SlidesMaking Great Looking Presentation Selecting new design, Changing Color Scheme, Switching to Slide and Title Master Views, Changing the Background color and shading, Text Fonts, Header and Footer Information, Adding logo to Background, Reordering Slides, Duplicating and deleting Slides. • Drawing shapes, lines, Adding Predefined shapes and Text boxes, Adding Shadows and 3-D Effects, Making text conform to shapes, Grouping and Ungrouping Shapes, Rearranging and Rotating Shapes • Show time Presenting on Paper, In Person and on the Wave Adding Transition Effects, Adding Preset Animation, Creating Custom Animations, setting up the show, Displaying the Show • Making on Organization Structure in Power Point • Starting an organization chart, Entering names and Titles, Adding Members, Formatting the Boxes, Text and Lines, Rearranging the Org Chart, Finishing the Chart	14

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SWAMINARAYAN UNIVERSITY
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FACULTY OF IT AND COMPUTER SCIENCE

COURSE CURRICULUM

Course Title: AYURVEDA AND NUTRITION
(Code: CVA104-1C-E)

IT and CS Programmes in which this course is offered	Semester in which offered
Bachelor of Computer Applications-(B.C.A)	Fourth Semester

Course Objectives –

- Evaluate changing food patterns and lifestyle over the years NIL
- Understand Indian Knowledge Systems (IKS) and key Vedic principles with respect to Food and Nutrition
- Apply basic tenets of traditional diets for health and disease
- Prepare selected healthy recipes based on Ayurvedic principles

Teaching and Examination Scheme –

Content Hours per Week			Course Credits		Examination Marks				
L	T	P	T	P	Theory Marks		Practical Marks		50
			2	0	E	M	I	EV	
2	0	0	2		25	25	0	0	

*E - External Examination, M- Mid Semester Examination, I- Internal Submission & Viva, EV - External Viva

DETAILED COURSE CONTENTS -

Sr.	Topic	Teaching Hrs.
1	**Introduction to Ayurvedic Nutrition** • Ayurveda and Indian food cultures • Nutrition and lifestyle transition over the years • Regional Food Traditions of India • Basic principles of Food and Nutrition and Ayurveda • Understanding rich sources of nutrients • Concept of Doshas& assessment • Ayurvedic Principles of food habits and factors determining quality of food (Aharavidhivisheshaayatana) • FSSAI regulations on AyurvedicAahar	12

2	**Ayurvedic Diets** • Principles of Diet: Aharavidhividhan, Sattvic, Rajasi, Tamasic foods • Incompatible food (ViruddhaAhara), Pathya; Apathya; VipritaAhaar • Lifestyle Management with Dincharya and Ritucharya • Application of Ayurvedic diets to stress linked food behaviour	12

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

SUGGESTED LEARNING RESOURCES

A. List of Books

SR NO.	TITLE OF BOOKS	AUTHOR NAME	PUBLICATION
1	Ayurvedic Science of Food and Nutrition	Rastogi S (2014)	ASIN: BOOHWMV094, Springer: ISBN-13:978-1461496274
2	Building bridges between Ayurveda and modern science	Rastogi S (2010)	Int J Ayurveda Res. 1(1):41-46.
3	FSSAI regulations on Ayurveda Aahar Regulations 2022.		Gazette of India CG-DL-E-07052022-235642. New Delhi

Revised Bloom's Taxonomy

Distribution of Theory Marks					
Remember	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Create**
07	**07**	**11**	**-**	**-**	**-**

*Legends: R = Remembrance; U = Understanding; A = Application N :Analyze and E :Evaluate C : Create and Above Levels (Revised Bloom's Taxonomy)

Course Outcomes:

Sr. No.	CO statement	Marks % Weightage
CO-1	**Students will understand Ayurvedic nutrition principles, Indian food cultures, and regional traditions to apply them to modern dietary contexts.**	**25**
CO-2	**Students will understand Ayurvedic principles of food, doshas, nutrient sources, and FSSAI regulations for Ayurvedic Aahar.**	**25**
CO-3	**Students will be able to analyze Ayurvedic dietary principles, classify foods, and identify compatible and incompatible food combinations.**	**25**
CO-4	**Students will be able to apply Ayurvedic principles of Dincharya, Ritucharya, and diet to manage lifestyle and stress-related eating habits.**	**25**

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FACULTY OF IT AND COMPUTER SCIENCE

COURSE CURRICULUM

Course Title: PYTHON PROGRAMMING
(Code: PPCAM108-1C)

IT and CS Programmes in which this course is offered	Semester in which offered
Bachelor of Computer Applications-(B.C.A)(Hons.)	Fourth Semester

Course Objectives –
This course introduces students the fundamentals of core python programming language and to use it for different applications development.

Teaching and Examination Scheme –

Content Hours per Week			Course Credits		Examination Marks				
			T	P	Theory Marks		Practical Marks		
L	T	P	2	2	E	M	I	EV	100
2	0	4	4		25	25	25	25	

*E - External Examination, M- Mid Semester Examination, I- Internal Submission & Viva, EV - External Viva

DETAILED COURSE CONTENTS -

Sr.	Topic	Teaching Hrs.
1	**Beginning with Python, Datatypes, Operators, I/O andControl statements** **Introduction to Python** Python, Features of Python, Viewing of Byte Code, Flavoursof Python, PVM, Memory Management in Python, Garbagecollection in python, Comparisons between C-Java-Python,Writing first Python program, Execution of a Python program(using command line, IDLE window and system prompt). **Datatypes in Python** Built-in datatypes, None types, Numeric types, Explicitconversion of datatypes, Sequences in Python, str, bytes,bytearray, List, Tuple, range, Sets, set datatype, frozenset,mapping types, Determining the	08

	datatype of a variable,Identifiers and reserved words, Naming conventions inPython. **Operators, I/O and control statements** Membership operators, Identity operators, Outputstatements, Input statements, Command line arguments, Aword on Indentation, The if-elif-else statement, Infinite loops,Nested Loops, The else Suite, break, continue, pass, assertand return statements.	
2	**Modules, Arrays, Functions, List, Tuples andDictionaries** **Modules, Arrays and Functions** Creating our own modules in python, Advantages of Array,Creating an Array, Importing the array module, Indexing-Slicing and Processing the arrays, Difference between afunction and a method, Defining-calling and returning(singleand multiple) results from a function, Pass by ObjectReference, Positional arguments, Keyword arguments,Default arguments, Variable length arguments, AnonymousFunctions, Function Decorators. **List and Tuples** Exploring List, Creating lists using range() function, Updatingthe elements of the list, Concatenation of two lists, Repetitionof lists, Membership in lists, Aliasing and Cloning lists,Methods to process List, Nested Lists, Tuples, Creating andaccessing Tuple elements, Basic operations on Tuples,Functions to process tuples, Nested Tuples and its sorting. **Dictionaries** Introduction to Dictionaries, Operations on Dictionaries,Dictionary methods, Converting List into Dictionary, Passingdictionaries to functions.	12
3	**Classes, Inheritance and Polymorphism** **Classes** Creating a class, The Self variable, Constructor, Types ofvariables, Types of methods, Passing members of one class toanother. **Inheritance** Implementing inheritance, Constructors in inheritance,Overriding Super class constructors and methods, Thesuper() method, Types of Inheritance, Single and multiple,problems in multiple inheritance, Method resolutionorder(MRO). **Polymorphism** Introduction to polymorphism, Duck Typing Philosophy ofPython, Operator overloading, method overloading, methodoverriding.	14
4	**Exception Handling, Standard Library, CreatingVirtual Environment and Python Database connectivity** **Exception Handling and Standard Library** Exceptions, Exception handling, Types of exceptions,Operating System Interface, File wildcards, Command linearguments, String pattern matching, mathematics , internetaccess, dates and times, data compression, performancemeasurement. **Creating virtual environment** Introduction, generating virtual environments, managingpackages with pip(Python Package Index). **Python and MySQL** Installing MySQL Connector, Verifying the ConnectorInstallation, Using MySQL from Python, Retrieving all rowsfrom a table,	08

	Inserting rows into a table, Deleting rows from	

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

Revised Bloom's Taxonomy

Distribution of Theory Marks					
Remember	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Create**
07	**07**	**11**	**-**	**-**	**-**

*Legends: R = Remembrance; U = Understanding; A = Application N :Analyze andE :EvaluateC :Create and Above Levels (Revised Bloom's Taxonomy)

SUGGESTED LEARNING RESOURCES

A. List of Books

SR NO.	TITLE OF BOOKS	AUTHOR NAME	PUBLICATION
1	Core Python Programming	By, Dr. R. Nageswara Rao,	2017 edition

B. List of Major Equipment/ Software

- Python 3.4.1 or higher
- IDE: IDLE
- Database: MySQL

C. List of Software/Learning Websites

1. https://www.python.org/about/apps/
2. https://www.w3schools.com/python/default.asp
3. https://www.tutorialspoint.com/python3/index.htm
4. https://www.programiz.com/python-programming/tutorial

Course Outcomes:

Sr. No.	CO statement	Marks % Weightage
CO-1	**To recognize why python is extensively used by developers and also study and employ different datatypes, operators, I/O and control statements.**	**20**
CO-2	**To define & implement class and different levels of inheritance.**	**30**
CO-3	**To learn creating modules and data structures like List, Tuples and Dictionaries**	**25**
CO-4	**To handle exceptions and work with the built in standard libraries.**	**25**

SUGGESTED LIST OF PRACTICAL/EXERCISES

Sr. No	Practical/ Exercises	Approx Hrs. Required
1.	Write a program to swap two numbers without taking atemporary variable.	02
2.	Write a program to display sum of two complex numbers.	02
3.	Write a program to create a byte type array, read, modify,and display the elements of the array	02
4.	Create a sequence of numbers using range datatype todisplay 1 to 30, with an increment of 2.	02
5.	Write a program to find out and display the common andthe non common elements in the list using membershipoperators	02
6.	Create a program to display memory locations of twovariables using id() function, and then use identityoperators two compare whether two objects are same ornot.	02
7.	Write a program that evaluates an expression given bythe user at run time using eval() function. Example: *Enter and expression: 10+8-9*2-(10*2)* *Result: -20*	02
8.	Write a python program to find the sum of even numbersusing command line arguments.	02
9.	Write a menu driven python program which perform thefollowing: Find area of circle Find area of triangle Find area of square and rectangle Find Simple Interest Exit.(Hint: Use infinite while loop for Menu)	02
10.	Write a program to assert the user enters a numbergreater than zero.	02
11.	Write a program to create one array from another array.	02
12.	Create a program to retrieve, display and update only arange of elements from an array using indexing andslicing in arrays.	02
13.	Write a program to understand various methods of arrayclass mentioned: append, insert, remove, pop, index,tolist and count.	02
14.	Write a program to sort the array elements using bubblesort technique.	02
15.	Create a program to search the position of an element inan array using index() method of array class.	02
16.	Write a program to create a Student class with name,age and marks as data members. Also create a methodnamed display() to view the student details. Create anobject to Student class and call the method using theobject.	02
17.	Write a program to create Student class with aconstructor having more than one parameter.	02
18.	Write a program to demonstrate the use of instance	02

	andclass/static variables.	
19.	Write a program to store data into instances usingmutatormethods and to retrieve data from the instancesusing accessor methods.	02
20.	Write a program to use class method to handle thecommon features of all the instance of Student class.	02
21.	Write a program to handle some built in exceptions like*ZeroDivisionError*.	02
22.	Write a program to handle multiple exceptions like*SyntaxError*and *TypeError*	02
23.	Write a program to import "*os*" module and to print thecurrent working directory and returns a list of all moduleFunctions	02
24.	Write a program to provide a function for making file listsfrom directory wildcard searches.	02
25.	Write a program to import *datetime*module and formatthe date as required. Also use the same module tocalculate the difference between your birthday and todayin days.	02

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COURSE CURRICULUM

Course Title: BIG DATA ANALYTICS
(Code: COCAE103-1C)

IT and CS Programmes in which this course is offered	Semester in which offered
Bachelor of Computer Applications-(B.C.A)	Fourth Semester

Course Objectives –To provide knowledge about scalable, reliable and distributed storage environment for huge amount of data.To provide insights of data analysis in distributed environment.To optimize business decisions and create competitive advantage with Big Dataanalytics .To introduce programming tools PIG & HIVE in Hadoop echo system. To able to realistically assess the application of big data analytics technologiesfor different usage scenarios

Today's world is a data-driven world. Increasingly, the efficient operation of organizations across sectors relies on the effective use of vast amounts of data. Big data analytics helps us to examine these data to uncover hidden patterns, correlations, and other insights. It is a fast-growing field and skills in the area are some of the most in-demand today.

Teaching and Examination Scheme –

Content Hours per Week			Course Credits		Examination Marks				
L	T	P	T	P	Theory Marks		Practical Marks		150
			3	2	E	M	I	EV	
3	0	2	4		60	40	30	20	

*E - External Examination, M- Mid Semester Examination, I- Internal Submission & Viva, EV - External Viva

DETAILED COURSE CONTENTS -

Sr.	Topic	Teaching Hrs.
1	**Introduction to Big Data** • Introduction– distributed file system–Big Data and its importance, Four Vs,Drivers for Big data, Big data analytics, Big data applications. Algorithmsusing map reduce **Introduction to Hadoop and its Architecture** • Big Data – Apache Hadoop & Hadoop EcoSystem, Moving Data in and out of Hadoop – Understanding inputs and outputs of MapReduce –Data Serialization	8
2	**HDFS, HIVE AND HIVEQL, HBASE** • HDFS-Overview, • Installation and Shell, • Java API; • Hive Architecture andInstallation, • Comparison with Traditional Database, HiveQL Querying Data,Sorting And Aggregating, Map Reduce Scripts, Joins & Sub queries, HBaseconcepts, • Advanced Usage, • Schema Design, • Advance Indexing, • PIG, • Zookeeper , how it helps in monitoring a cluster, HBase uses Zookeeper andhow to Build Applications with Zookeeper	10
3	**SPARK** • Introduction to Data Analysis with Spark, • Downloading Spark and GettingStarted, • Programming with RDDs, • Machine Learning with MLlib	8
4	**NoSQL** • What is it?, • Where It is Used Types of NoSQL databases, • Why NoSQL?, • Advantages of NoSQL, Use of NoSQL in Industry, • SQL vs NoSQL, • NewSQL	10
5	**Database for the Modern Web** • Introduction to MongoDB key features, • Core Server tools, • MongoDBthrough the JavaScript's Shell, • Creating and Querying through Indexes, • Document-Oriented, principles of schema design, Constructing queries onDatabases, • collections and Documents, • MongoDB Query Language	12

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

Revised Bloom's Taxonomy

Distribution of Theory Marks					
Remember	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Create**
07	**07**	**11**	**-**	**-**	**-**

*Legends: R = Remembrance; U = Understanding; A = Application N :Analyze andE :EvaluateC :Create and Above Levels (Revised Bloom's Taxonomy)

SUGGESTED LEARNING RESOURCES

A. List of Books

SR NO.	TITLE OF BOOKS	AUTHOR NAME	PUBLICATION
1	Intelligent Data Analysis	Michael Berthold, David J. Hand	Springer
2	Taming The Big Data Tidal Wave: Finding Opportunities In Huge Data Streams With Advanced Analytics	Bill Franks	Wiley
3	Professional Hadoop Solutions	Boris lublinsky, Kevin t. Smith, Alexey Yakubovich	Wiley.
4	Understanding Big data	Chris Eaton and Paul C. Zikopoulos	TMH
5	Big Data and Analytics	Seema Acharya, SubhashiniChhellappan	Willey,
6	MongoDB in Action	Kyle Banker, PiterBakkum , Shaun Verch	DreamTech,

B. List of Software/Learning Websites

http://in.reuters.com/tools/rss

http://www.altova.com/xmlspy.html

https://www.w3.org/RDF/

Course Outcomes:

Sr. No.	CO statement	Marks % Weightage
CO-1	**To understand the fundamentals of Big Data, including its characteristics, drivers, and applications, and apply**	**15**

	MapReduce algorithms within the Hadoop ecosystem for data processing and analysis.	
CO-2	**To implement and utilize HDFS for distributed file storage, perform data querying and analysis with Hive and HiveQL, and design and interact with NoSQL databases using HBase, leveraging related technologies like Pig and Zookeeper for cluster management and application development**	**20**
CO-3	**Students will be able to use Apache Spark to perform data analysis, manipulate Resilient Distributed Datasets (RDDs), and apply basic machine learning algorithms using MLlib.**	**20**
CO-4	**To understand the core concepts of NoSQL databases, differentiate various NoSQL database types, and evaluate their advantages, disadvantages, and appropriate use cases in comparison to SQL and NewSQL databases.**	**25**
CO-5	**Able to design, implement, and query document-oriented databases using MongoDB, leveraging its key features, core tools, and JavaScript shell for modern web applications.**	**20**

SUGGESTED LIST OF PRACTICAL/EXERCISES

Sr. No	**Practical/ Exercises**	**Approx Hrs. Required**
1.	**Case Study:** **Stage 1:** Selection of case study topics and formation of small working groups of 2/3 students per group. Students engage with the cases, read through background material provided in the session and work through an initial set of questions to deepen the understanding of the case. Sample applications and data will be provided to help students familiarize themselves with the cases and available (big) data. **Stage 2:** The groups are given a specific task relevant to the case in question and are expected to develop a corresponding big data concept using the knowledge gained in the course and the parameters set by the case study scenario. A set of questions that help guide through the scenarios will be provided. **Stage 3:** Each group prepares a short 2 – 5 page report on their results and a 10 min oral presentation of their big data concept.	**06**
2.	To draw and explain Hadoop Architecture and Ecosystem with the help of a casestudy using WorkCount example. To define and install Hadoop.	**02**
3.	To understand the overall programming architecture using Map Reduce API.	**02**
4.	To implement the following file management tasks in Hadoop System (HDFS):Adding files and directories, Retrieving files, Deleting files.	**02**
5.	Store the basic information about students such as roll no, name,	**02**

	date of birth ,and address of student using various collection types such as List, Set and Map.	
6.	Basic CRUD operations in MongoDB.	**02**
7.	To perform NoSQL database using MongoDB to create, update and insert.	**02**
8.	Retrieve various types of documents from students collection.	**02**
9.	To find documents from Students collection.	**02**
10.	To run a basic Word Count MapReduce program to understand MapReduce	**02**
11.	Paradigm: To count words in a given file, To view the output file, and To calculate	**02**

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