GANDHI INSTITUTE OF TECHNOLOGY AND MANAGEMENT(GITAM)
(Deemed to be University)
VISAKHAPATNAM * HYDERABAD * BENGALURU

Accredited by NAAC with A^{+} Grade

CURRICULUM AND SYLLABUS

OF

UMGMT04: BBA (Business Analytics)

w.e.f 2021-22 admitted batch

(Updated up to Sep 2022)

Academic Regulations

Applicable for the Undergraduate Programmes in the Schools of Business, Humanities & Social Sciences, Science, Technology

https://www.gitam.edu/academic-regulations

VISION AND MISSION OF THE UNIVERSITY

VISION

To become a global leader in higher education.

MISSION

To impart futuristic and comprehensive education of global standards with a high sense of discipline and social relevance in a serene and invigorating environment.

UMGMT04: BBA (Business Analytics)

VISION AND MISSION OF THE SCHOOL

VISION

To be a world class business school through transformative education, research, Innovation and entrepreneurship.

MISSION

1. To achieve excellence in academic program design and academic delivery.
2. To pursue research that adds value to scholarship and improves business practice.
3. To undertake entrepreneurial and social initiatives to address social, economic, and environmental challenges to create societal impact and sustainability.

UMGMT04: BBA (Business Analytics)

(w.e.f. 2021-22 admitted batch)

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO 01 To develop individuals with conceptual knowledge in the multiple disciplines of analytics comprising of mathematics, statistics, information technology and management

PEO 02 To develop individuals who can pursue career in the area of analytics and continue their professional development by obtaining masters degree specializing in different domains related to analytics.

PEO 03 To develop individuals who can apply analytics tools and techniques to solve business analytics problems.

PEO 04 To imbibe value-based education to the students that will help them to function effectively in their business analytics career.

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Mapping of the Mission of the School with the PEOs

	PEO1	PEO2	PEO3	PEO4
M1	H	H	M	M
M2	H	M	H	M
M3	L	L	L	M

H – High, M – Medium, L – Low

UMGMT04: BBA (Business Analytics)

PROGRAMME OUTCOMES(POs) AND PROGRAMME SPECIFIC OUTCOMES(PSOs):

At the end of the Programme the students would be able to:

PO1	Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.
PO2	Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.
PO3	Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.
PO4	Effective Citizenship: Demonstrate empathetic social concern and equity centered national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.
PO5	Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
PO6	Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.
PO7	Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context of socio-technological changes.
PSO1	Understand the fundamental theories and practices of management.
PSO2	Examine the business situations from an analytics perspective
PSO3	Ability to apply analytics techniques for decision making.
PSO4	Evaluate business situations using analytics tools (Business Analytics)

Curriculum Structure

(Flexible Credit System)

UNIVERSITY CORE (UC)								
Course code	**Level**	**Course title**	**L**	**T**	**P**	**S**	**J**	**C**
CSEN1001	1	IT Productivity Tools^	0	0	2	0	0	1*
CLAD1001	1	Emotional Intelligence & Reasoning Skills (Soft Skills 1)	0	0	2	0	0	1
CLAD1011	1	Leadership Skills & Quantitative Aptitude (Soft Skills 2)	0	0	2	0	0	1
CLAD1021	1	Verbal Ability & Quantitative Ability (Soft Skills 3)	0	0	2	0	0	1
CLAD1031	1	Practicing Verbal Ability & Quantitative Aptitude (Soft Skills 4)	0	0	2	0	0	1
CLAD20XX	2	Soft skills 5A/5B/5C	0	0	2	0	0	1
CLAD20XX	2	Soft skills 6A/6B/6C	0	0	2	0	0	1
DOSP10XX	1	Sports 1#	0	0	0	2	0	2*
DOSL10XX	1	Club Activity#	0	0	0	2	0	2*
DOSL10XX	1	Community Service#	0	0	0	0	2	2*
ENVS1001	1	Environmental Studies^	3	0	0	0	0	3*
FINA3001	3	Personal Financial Planning#	0	0	2	0	0	1*
LANG1001	1	Communication Skills in English - Beginners	0	0	4	0	0	2*
LANG1011	1	Communication Skills in English	0	0	4	0	0	2
LANG1021	1	Advanced Communication Skills in English	0	0	4	0	0	2
MFST1001	1	Health and Wellbeing#	0	0	2	0	0	1*
POLS1001	1	Indian Constitution and History	2	0	0	0	0	2*
PHPY1001	1	Gandhi for the 21st Century	2	0	0	0	0	2*
VEDC1001	1	Venture Development	0	0	0	2	0	2

* Pass/Fail courses

Opt any three courses among the five

^ Online/Swayam/NPTEL Courses

Soft skills courses 5 and 6								
Course code	**Level**	**Course title**	**L**	**T**	**P**	**S**	**J**	**C**
CLAD2001	2	Preparation for Campus Placement-1 (Soft skills 5A)	0	0	2	0	0	1
CLAD2011	2	Preparation for Higher Education (GRE/ GMAT)-1 (Soft skills 5B)	0	0	2	0	0	1
CLAD2021	2	Preparation for CAT/ MAT - 1 (Soft skills 5C)	0	0	2	0	0	1
CLAD2031	2	Preparation for Campus Placement-2 (Soft skills 6A)	0	0	2	0	0	1
CLAD2041	2	Preparation for Higher Education (GRE/ GMAT)-2 (Soft skills 6B)	0	0	2	0	0	1
CLAD2051	2	Preparation for CAT/ MAT - 2 (Soft skills 6C)	0	0	2	0	0	1

Sports Courses								
Course code	**Level**	**Course title**	**L**	**T**	**P**	**S**	**J**	**C**
DOSP1001	1	Badminton	0	0	0	2	0	2
DOSP1011	1	Chess	0	0	0	2	0	2
DOSP1021	1	Carrom	0	0	0	2	0	2
DOSP1031	1	Football	0	0	0	2	0	2
DOSP1041	1	Volleyball	0	0	0	2	0	2
DOSP1051	1	Kabaddi	0	0	0	2	0	2
DOSP1061	1	Kho Kho	0	0	0	2	0	2
DOSP1071	1	Table Tennis	0	0	0	2	0	2
DOSP1081	1	Handball	0	0	0	2	0	2
DOSP1091	1	Basketball	0	0	0	2	0	2
DOSP1101	1	Tennis	0	0	0	2	0	2
DOSP1111	1	Throwball	0	0	0	2	0	2

Club Activity Courses								
Course code	**Level**	**Course title**	**L**	**T**	**P**	**S**	**J**	**C**
DOSL1001	1	Club Activity (Participant)	0	0	0	2	0	2
DOSL1011	1	Club Activity (Member of the Club)	0	0	0	2	0	2
DOSL1021	1	Club Activity (Leader of the Club)	0	0	0	2	0	2
DOSL1031	1	Club Activity (Competitor)	0	0	0	2	0	2
Community Service courses								
Course code	**Level**	**Course title**	**L**	**T**	**P**	**S**	**J**	**C**
DOSL1041	1	Community Services - Volunteer	0	0	0	0	2	2
DOSL1051	1	Community Services - Mobilizer	0	0	0	0	2	2

Faculty Core (FC)								
Course code	**Level**	**Course title**	**L**	**T**	**P**	**S**	**J**	**C**
IENT1001	1	Business Economics	3	0	0	0	0	3
ACCN1011	1	Financial Accounting and Analysis	4	0	0	0	0	4
IENT1011	1	Indian Business Environment	3	0	0	0	0	3
HRMG1001	1	Principles and Practice of Management	3	0	0	0	0	3
LANG1XXX	1	Telugu/Sanskrit Hindi/Special English	3	0	0	0	0	3
HRMG1021	1	Human Resource Management	3	0	0	0	0	3
MKTG1001	1	Marketing Management	3	0	0	0	0	3
IENT2001	2	Entrepreneurship	2	0	0	0	0	2
FINA2001	2	Essentials Financial Management	3	0	0	0	0	3

Second Language Courses								
Course code	**Level**	**Course title**	**L**	**T**	**P**	**S**	**J**	**C**
LANG1081	1	Special English	3	0	0	0	0	3
LANG1091	1	Hindi	3	0	0	0	0	3
LANG1101	1	Sanskrit	3	0	0	0	0	3
LANG1111	1	Telugu	3	0	0	0	0	3

Programme Core/ Major Core (PC/MaC)								
Course code	**Level**	**Course title**	**L**	**T**	**P**	**S**	**J**	**C**
OPTS1011	1	Calculus - 1	4	0	0	0	0	4
BUAN1001	1	Programming in C++	3	0	0	0	0	3
OPTS1061	1	Calculus - 2	4	0	0	0	0	4
BUAN1011	1	Data Structures with C++	3	0	0	0	0	3
BUAN1021	1	Data Analysis with MS Excel	3	0	0	0	0	3
OPTS2011	2	Discrete Mathematics	3	0	0	0	0	3
OPTS2021	2	Statistical Methods	4	0	0	0	0	4
BUAN2021	2	Data Visualization with Tableau	3	0	0	0	0	3
BUAN2031	2	Data Analysis with R	4	0	0	0	0	4
BUAN2041	2	Predictive Analytics and Decision Making	4	0	0	0	0	4
BUAN2051	2	Artificial Intelligence	3	0	0	0	0	3
BUAN2061	2	Data Analysis with Python	3	0	0	0	0	3
OPTS2031	2	Business Research Methodology	3	0	0	0	0	3
OPTS3001	3	Operations Research	4	0	0	0	0	4
BUAN3001	2	Machine Learning	3	0	0	0	0	3
BUAN3011	3	Database Management Systems	3	0	0	0	0	3
BUAN3021	3	Business Analysis	3	0	0	0	0	3
BUAN3031	3	Web Analytics	3	0	0	0	0	3
OPTS3011	3	Statistical Quality Control and Six Sigma	3	0	0	0	0	3
BUAN3041	3	Big Data Analytics	4	0	0	0	0	4
INTN2777	3	Internship	0	0	2	0	0	2
VIVA3999	3	Comprehensive Viva Voce	0	0	2	0	0	2

Credit Distribution Table

Description	Number of Credits	% of Credits
University Core (UC)	12	10%
Faculty Core (FC)	27	22.5%
Program Core (PC)	72	60%
Open Elective (OE)	9	7.5%
Total	120	100

CO PO Mapping

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO 1	PSO 2	PSO 3	PSO 4
IENT1001	Business Economics	H	H	M	H	H	M	M	M	H	H	H
ACCN1011	Financial Accounting and Analysis	H	H	H	M	H	H	H	H	H	H	H
IENT1011	Indian Business Environment	H	H	H	H	H	H	M	H	H	H	H
HRMG1001	Principles and Practice of Management	H	H	H	H	M	M	H	H	H	H	H
LANG1081	Telugu/Sanskrit Hindi/Special English	H	H	H	H	M	M	H	H	H	H	H
HRMG1021	Human Resource Management	H	H	H	H	M	M	H	H	H	H	H
MKTG1001	Marketing Management	H	H	H	M	H	H	H	H	H	H	H
IENT2001	Entrepreneurship	H	H	H	H	M	M	H	H	H	H	H
FINA2001	Essentials Financial Management	H	M	M	M	L	H	M	L	H	M	H
LANG1081	Special English	H	H	H	H	M	M	H	H	H	H	H
LANG1091	Hindi	H	M	M	M	L	H	M	L	H	M	H
LANG1101	Sanskrit	H	H	H	H	M	M	H	H	H	H	H
LANG1111	Telugu	H	M	M	M	L	H	M	L	H	M	H
OPTS1011	Calculus - 1	H	M	M	M	L	H	M	L	H	M	H
BUAN1001	Programming in C++	H	H	H	H	M	M	H	H	H	H	H
OPTS1061	Calculus - 2	H	H	H	H	M	M	H	H	H	H	H
BUAN1011	Data Structures with C++	H	M	M	L	L	M	L	H	H	M	H
BUAN1021	Data Analysis with MS Excel	H	H	H	H	M	M	H	H	H	H	H
OPTS2011	Discrete Mathematics	H	H	H	H	M	M	H	H	H	H	H
OPTS2021	Statistical Methods	H	H	H	H	M	M	H	H	H	H	H
BUAN2021	Data Visualization with Tableau	H	H	H	H	M	M	H	H	H	H	H
BUAN2031	Data Analysis with R	H	H	H	H	M	M	H	H	H	H	H
BUAN2041	Predictive Analytics and Decision Making	H	H	H	H	M	M	H	H	H	H	H
BUAN2051	Artificial Intelligence	H	H	H	H	M	M	H	H	H	H	H
BUAN2061	Data Analysis with Python	H	H	H	H	M	M	H	H	H	H	H
OPTS2031	Business Research Methodology	H	H	H	H	M	M	H	H	H	H	H
OPTS3001	Operations Research	H	H	H	H	M	M	H	H	H	H	H
BUAN3001	Machine Learning	H	H	H	H	M	M	H	H	H	H	H
BUAN3011	Database Management Systems	H	H	H	H	M	M	H	H	H	H	H
BUAN3021	Business Analysis	H	M	M	M	L	H	M	M	H	M	M
BUAN3031	Web Analytics	H	H	H	M	H	L	L	L	H	M	M
OPTS3011	Statistical Quality Control and Six Sigma	H	H	H	H	M	M	H	H	H	H	H
BUAN3041	Big Data Analytics	H	H	H	M	H	L	L	L	H	M	M
INTN2777	Internship	H	H	H	H	M	M	H	H	H	H	H
VIVA3999	Comprehensive Viva Voce	H	H	H	M	H	L	L	L	H	M	M

Syllabus

University Core

CSEN1001	IT PRODUCTIVITY TOOLS	L	T	P	S	J	C
		0	0	2	0	0	1
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	Familiarity with Computer system and its operation.						

Course Description:

This course introduces all software tools that improve the productivity of a student in enhancing his learning experience with all the activities taken up as part of his coursework.

Course Educational Objectives:

- to impart the skill in preparing technical documents of professional quality using docs, sheets and forms
- to involve the student in preparation of websites, analyzing data and acquaint the student with the skill of processing audio, images, documents etc.

10 hours

List of Experiments:

1. Create a typical document consisting of text, tables, pictures, multiple columns, with different page orientations.
2. Create a technical paper / technical report consisting of table of contents, table of figures, table of tables, bibilography, index, etc.
3. Compose and send customized mail / e-mail using mail-merge.
4. Create / modify a power point presentation with text, multimedia using templates with animation.
5. Create spreadsheet with basic calculations with relative reference, absolute reference and mixed reference methods.
6. Simple report preparation using filtering tool / advanced filtering commands / pivot tables in spreadsheet application.
7. Analyze the results of a examination student wise, teacher wise, course wise, institute-wise.
8. Collecting and consolidating data using collaborative tools like google docs, sheets, forms.
9. Create charts / pictures using online tools like: www.draw.io or smartdraw
10. Create a website of his interest.

Textbooks:

1. Katherin Murray, 'Microsoft Office 365 Connect and collaborate virtually anywhere, anytime', Microsoft Press, ISBN: 978-0-7356-5694-9
2. EXCEL 2021 The Comprehensive Beginners to Advanced Users Guide to Master Microsoft Excel 2021. Learn the Essential Functions, New Features, Formulas, Tips and Tricks, and Many More

3. https://drawio-app.com/tutorials/video-tutorials/
   Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics Fourth Edition ISBN-13: 978-1449319274

References

1. https://www.coursera.org/learn/introduction-to-computers-and-office-productivity-software
2. https://www.coursera.org/projects/analyze-data-pivot-tables-crosstabs-google-sheets
3. https://www.coursera.org/learn/excel-advanced#syllabus
4. https://www.coursera.org/learn/how-to-create-a-website
5. https://support.microsoft.com/en-us/office
6. https://www.diagrams.net/
7. https://edu.google.com/

Course Outcomes:

1. Create / alter documents / Technical Paper / Project report with text, pictures, graphs of different styles.
2. Create / modify power point presentations with text, multimedia and to add animation using / creating templates.
3. Perform basic calculations / retrieve data / create pivot tables / chart using a spreadsheet application.
4. Create simple diagrams / charts using online tools like: www.draw.io .
5. Manage documents, presentations, spreadsheets and websites in collaborative mode.

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1					2				1	1	
CO2					2				1	1	
CO3	2	1	1		2				1	1	
CO4					2				1	1	
CO5					2				3	3	

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :06-09-2021 **ACADEMIC COUNCIL:17-09-201**

SDG No. & Statement:4

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

SDG Justification:

Emotional Intelligence and reasoning skills are essential for achieving inclusive and equitable education and lifelong learning opportunities for oneself and others.

CLAD1001	EMOTIONAL INTELLIGENCE & REASONING SKILLS (SOFT SKILLS 1)	L	T	P	S	J	C
		0	0	2	0	0	1
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Emotional intelligence is a set of skills that are thought to contribute to the appraisal of emotions in oneself and others. It can also help contribute to the effective regulation of emotions as well as feelings (Salovey & Mayer, 1990). In terms of emotional intelligence, self-awareness and self- management have to do with our ability to relate to ourselves. Social awareness and relationship management have to do with our ability to relate to others. Similarly, the ability to solve questions on Analytical Reasoning and Data Sufficiency is a critical area tested in almost all competitive examinations and admission tests. Upon completion, students should be able (1) to deal with theirown emotions as well as the emotions of others and relate better with both. Using better knowledgeof EI, students will also be able to set more meaningful goals for themselves, choose suitable time management techniques that work best for them and work in teams more effectively. (2) to apply different concepts, ideas, and methods to solve questions in reasoning and data sufficiency

Course Educational Objectives:

- Use EI to relate more effectively to themselves, their colleagues and to others. Apply self-awareness and self-assessment (SWOT) to better understand and manage their own emotions. Apply social awareness to empathize with others and build stronger relationships with others.
- Set meaningful goals based on their strengths and weaknesses and apply time management techniques, such as Q4 organizing to put first things first.
- Manage conflicts and work in teams in an emotionally intelligent manner.
- Solve questions on non-verbal and analytical reasoning, data sufficiency and puzzles

List of Activities & Tasks for Assessment:

Unit	Topics	Hours
1	Self-Awareness & Self-Regulation: Introduction to Emotional Intelligence, *Self-Awareness:* Self-Motivation, Accurate Self-Assessment (SWOT Analysis),Self-Regulation: *Self Control, Trustworthiness & Adaptability*	3

2	Importance, Practising Social Awareness, Building Relationships, Healthy andUnhealthy Relationships, Relationship Management Competencies-Influence, Empathy, Communication, Types of Conflicts, Causes, Conflict Management	3
3	Social Media: Creating a blog, use of messaging applications, creating awebsite to showcase individual talent, creation of a LinkedIn Profile	2
4	Goal Setting & Time Management: Setting SMART Goals, Time Wasters, Prioritization, Urgent Vs Important, Q2 Organization	3
5	Teamwork: Team Spirit, Difference Between Effective and Ineffective Teams, Characteristics of High Performance Teams, Team Bonding, Persuasion, Team Culture, Building Trust, Emotional Bank Account	4
6	Verbal Reasoning: Introduction, Coding-decoding, Blood relations, Ranking Directions, Group Reasoning	6
7	Analytical Reasoning: Cubes and Dices, Counting of Geometrical figures	3
8	Logical Deduction: Venn diagrams, Syllogisms, Data Sufficiency, Binary logic	4
9	Spatial Reasoning: Shapes, Paper Cutting/Folding, Mirror images, Water images and Rotation of figures	2

References:

1. Verbal Ability & Reading Comprehension by Arun Sharma and Meenakshi Upadhyay
2. Study material for CAT, SAT, GRE, GMAT by TIME, Career Launcher and IMS etc.
3. Quantitative Aptitude by R S Agarwal S Chand Publications
4. Quantitative Aptitude by Pearson Publications

Course Outcomes:

1. Students will be able to relate more effectively to themselves, their colleagues and to others
2. Students will be able to set their short term and long term goals and better manage their time
3. Students will be able to manage conflicts in an emotionally intelligent manner and work inteams effectively
4. Students will be able to solve questions based on non-verbal and analytical reasoning, datasufficiency and puzzle

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1		3	3				3				
CO2		3	3				3				
CO3		3	3				3				
CO4	3						3				
CO5											

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :17-09-2021 **ACADEMIC COUNCIL:17-09-201**

SDG No. & Statement:4

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

SDG Justification:

Emotional Intelligence and reasoning skills are essential for achieving inclusive and equitable education and lifelong learning opportunities for oneself and others.

CLAD1011	LEADERSHIP SKILLS & QUANTITATIVE APTITUDE (SOFT SKILLS 2)	L	T	P	S	J	C
		0	0	2	0	0	1
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Communication Skills is having the ability to convey information to others so that messages are understood, and outcomes delivered. Some essential qualities of Communication Skills include understanding the needs of others, clearly communicating messages, adapting the communication style, and using a range of communication methods. Presentation Skills is having the ability to confidently deliver an engaging messageto a group of people which achieves the objectives. Some essential qualities of Presentation Skills include a thorough preparation of content, structuring content logically, managing nerves, engaging your audience, delivering presentation objectives, positively influencing the audience, and responding to audience needs.Tackling questions based on numbers, arithmetic, data interpretation and puzzles requires the application of different rules and concepts of numerical computation, numerical estimation, and data estimation.

Course Educational Objectives:

- Learn and apply, through different individual and group activities, different ideas, and skills tocommunicate in a positive and impressive manner.
- Apply the goal setting process (based on SWOT) and Q2 organizing for effective time management.
- Apply different concepts in numbers, numerical computation, and numerical estimation to solvequestions that often appear in various competitive examinations and admission tests.
- Apply different concepts for tackling questions based on data interpretation, progression and series thatare frequently given in various competitive examinations and admission tests.

List of Activities & Tasks for Assessment:

Unit	Topics	Hours
1	Communication Skills: The Communication Process, Elements of Interpersonal Communication, Non-Verbal Communication: Body Language, Posture, Eye Contact, Smile, Tone of Voice, Barriers to	5

	Communication. Effective Listening Skills: Active Listening, Passive Listening, Asking Questions, Empathizing, Being Non-Judgmental, Being Open Minded, Mass Communication: Design of Posters, Advertisements, notices, writing formal and informal invitations	
2	Focus on Audience Needs, focus on the Core Message, Use Body Language andVoice, Start Strongly, Organizing Ideas & Using Visual Aids: SPAM Model, EffectiveOpening and Closing Techniques, Guy Kawasaki's Rule (10-20-30 Rule), Overcoming Stage Fear, Story Telling	3
3	Problem Solving & Decision Making: Difference Between the Two, Steps in RationalApproach to Problem Solving: Defining the Problem, Identifying the Root Causes, Generating Alternative Solutions, Evaluating and Selecting Solutions, Implementingand Following-Up, Case Studies	3
4	Group Discussion: Understanding GD, Evaluation Criteria, Nine Essential Qualities for Success, Positive and Negative Roles, Mind Mapping, structuring a Response, Methods of Generating Fresh Ideas	4
5	Number Theory: Number System, Divisibility rules, Remainders and LCM & HCF	3
6	Numerical Computation and Estimation - I: Chain Rule, Ratio Proportions, Partnerships & Averages, Percentages, Profit-Loss & Discounts, Mixtures, Problem on Numbers & ages	6
7	Data Interpretation: Interpretation and analysis of data in Tables, Caselets, Line- graphs, Pie-graphs, Boxplots, Scatterplots and Data Sufficiency	3
8	Mental Ability: Series (Number, Letter and Alphanumeric), Analogy (Number, Letter and Alphanumeric) and Classifications	3

References:

1. Verbal Ability & Reading Comprehension by Arun Sharma and Meenakshi Upadhyay
2. Study material for CAT, SAT, GRE, GMAT by TIME, Career Launcher and IMS etc.
3. Quantitative Aptitude by R S Agarwal S Chand Publications
4. Quantitative Aptitude by Pearson Publications

Course Outcomes:

1. Students will be able to communicate 'one-on-one' and 'one-on-many' confidently using both verbal and non-verbal messages and deliver impressive talks/

presentations to a group both with and without the use of PPTs and create posters, advertisements, etc.

2. Students will be able to apply the rational model of problem solving and decision makingin their problem solving and decision-making efforts.
3. Students will be able to solve questions based on numbers and arithmetic given in various competitive examinations
4. Students will be able to solve questions based on data interpretation, progressions, and series.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1		3	3				3				
CO2		3	3				3				
CO3	3						2				
CO4	3						2				
CO5											

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :17-09-2021 **ACADEMIC COUNCIL:17-09-2021**

SDG No. & Statement:4

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

SDG Justification:

Leadership and quantitative aptitude skills are essential skills for achieving inclusive and equitable education and lifelong learning opportunities for oneself and others.

CLAD1021	VERBAL ABILITY & QUANTITATIVE ABILITY (SOFT SKILLS 3)	L	T	P	S	J	C
		0	0	2	0	0	1
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Vocabulary is an important part of verbal ability. An understanding of word formation, prefixes, suffixes, and roots is necessary to remember and use a vast repository of words. Approaching words through word families and other ways of groupings is an effective way of gaining mastery over vocabulary. Understanding and getting acquainted with the different rules and exceptions in the use of grammar and structure, especially from the relevant examination point of view, is crucial to cracking questions given in many competitive tests. Similarly, improving reading comprehension skills and test taking abilities in this area takes time and effort, especially given the fact that most students do not possess strong reading habits. In so far as quantitative aptitude is concerned, students need to develop a strong foundation on the basic mathematical concepts of numerical estimation, geometry, mensuration, data sufficiency, etc. to be able to crack different round 1 tests of major recruiters and admission tests of top Indian and foreign universities.

Course Educational Objectives:

- List and discuss the different word formation methods, word denotation, connotation, collocation, etc. and introduce selected high frequency words, their antonyms, synonyms, etc.
- Apply different advanced reading skills to solve questions based on author's tone, main ideas and sub-ideas, inferences, Para jumbles, etc. that are frequently asked in various competitive exams and admission tests.
- Solve different types of questions based on vocabulary, such as word analogy; structure, grammar, and verbal reasoning; introduce common errors and their detection and correction.
- Solve questions on numerical estimation, mensuration, data sufficiency based on quantitative aptitude. This includes questions on time and work, time and distance, pipes and cisterns, lines and angles, triangles, quadrilaterals, polygons and circles, 2- & 3-dimensional mensuration.

List of Activities & Tasks for Assessment:

1. **Vocabulary Builder:** Understanding Word Formation, Prefixes, Suffixes and Roots, Etymology, Word Denotation, Connotation and Collocation, Synonyms and Antonyms
2. **Reading Comprehension:** Advanced Reading Comprehension: Types of RC passages, Types of Text Structures, Types of RC Questions: Distinguishing Between Major Ideas and Sub Ideas, Identifying the Tone and Purpose of the Author, Reading Between the Lines and Beyond the Lines, Techniques for Answering Different Types of Questions
3. **Para Jumbles:** Coherence and Cohesion, Idea Organization Styles, Concept of Mandatory Pairs and Its Application: Transitional Words, Antecedent-Pronoun Reference, Article Reference, Cause and Effect, Chronological Order, General to Specify, Specify to General, Idea-Example, Idea-Explanation, Etc.
4. **Grammar Usage:** Rules Governing the Usage of Nouns, Pronouns, Adjectives, Adverbs, Conjunctions, Prepositions and Articles
5. **Numerical Computation and Estimation - II:** Time and Work, Pipes and Cisterns, Time and Distance, Problems on Trains, Boats and Streams, Races and Games of Skill, Simple Interest& Compound Interest
6. **Geometry:** Lines and Angles, Triangles, Quadrilaterals & Polygons, and Circles
7. **Mensuration:** 2-Dimensional Mensuration (Triangles, Quadrilaterals and Circles), 3-Dimensional Mensuration (Cubes, Cuboids, Cylinder, Cone, Sphere)

References:

1. Verbal Ability & Reading Comprehension by Arun Sharma and Meenakshi Upadhyay
2. Study material for CAT, SAT, GRE, GMAT by TIME, Career Launcher and IMS etc.
3. Quantitative Aptitude by R S Agarwal S Chand Publications
4. Quantitative Aptitude by Pearson Publications

Course Outcomes:

1. List and discuss word formation methods, selected high frequency words, their antonyms, synonyms, etc.
2. Analyze reading passages and quickly find out the correct responses to questions asked, including para jumbles, by using reading skills like skimming, scanning, reading between the lines, etc.
3. Solve different types of questions based on vocabulary, structure, grammar and verbal reasoning
4. Solve questions on numerical estimation, mensuration, data sufficiency based on quantitative aptitude

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1		2					2				
CO2		2					2				
CO3	3						2				
CO4	3						2				
CO5											

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :17-09-2021 **ACADEMIC COUNCIL:17-09-2021**

SDG No. & Statement:4

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

SDG Justification:

English language and quantitative aptitude skills are essential skills for achieving inclusive and equitable education and lifelong learning opportunities for oneself and others.

CLAD1031	PRACTICING VERBAL ABILITY & QUANTITATIVE APTITUDE (SOFT SKILLS 4)	L	T	P	S	J	C
		0	0	2	0	0	1
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

A sound knowledge of the rules of English grammar, structure and style and its application in detecting errors in writing are important areas of Verbal Ability frequently tested as a part of the written test in many competitive examinations and admission tests of major recruiters and universities respectively. This module focuses on all important areas of grammar and structure commonly asked in major tests, such as GMAT, CAT, XLRI, CRT, etc. Similarly, in the area of Quantitative Aptitude, different kinds of questions are asked from Combinatorics (Permutations & Combinations, Probability], Cryptarithmetic & Modular Arithmetic (Cryptarithmetic, Application of base system (7, 24), Clocks (Base 24), Calendars (Base 7), and Mental Ability (Number series, Letter series & Alpha numeric series, Analogies (Numbers, letters), Classifications, Algebra (Exponents, Logarithms, Problems related to Equations, Special Equations, and Statistics) . This module focuses on all these areas by building on what the students already learnt in their earlier studies.

Course Educational Objectives:

- Apply the rules of grammar to solve questions in Error Detection, Sentence Correction and Sentence Improvement.
- Apply the rules of structure to solve questions in Error Detection, Sentence Correction and Sentence Improvement, Fill-in-blanks and Cloze Passages.
- Explain methods of solving problems in Combinatorics (Permutations & Combinations, Probability], Cryptarithmetic & Modular Arithmetic (Cryptarithmetic, Application of basesystem (7, 24), Clocks (Base 24), Calendars (Base 7)]
- Explain how to solve questions in Mental Ability (Number series, Letter series & Alpha numeric series, Analogies, Numbers, letters, Classifications] and Algebra (Exponents, Logarithms, Problems related to Equations, Special Equations, Statistics)

List of Activities & Tasks for Assessment:

1. Error Detection: Pronouns, Conjunctions, Prepositions and Articles
2. Error Detection: Tenses and their Uses
3. Sentence Correction: Subject-Verb Agreement, Antecedent-Pronoun Agreement, Conditional Clauses

4. Sentence Correction: Modifiers (Misplaced and Dangling) & Determiners, Parallelism & WordOrder, and Degrees of Comparison
5. Combinatorics: Permutations & Combinations, Probability
6. Crypt arithmetic & Modular Arithmetic: Crypt arithmetic, Application of Base System (7, 24),Clocks (Base 24), Calendars (Base 7)
7. Algebra: Exponents, Logarithms, Word-problems related to equations, Special Equations,Progressions, Statistics

References:

1. Verbal Ability & Reading Comprehension by Arun Sharma and Meenakshi Upadhyay
2. Study material for CAT, SAT, GRE, GMAT by TIME, Career Launcher and IMS etc.
3. Quantitative Aptitude by R S Agarwal S Chand Publications
4. Quantitative Aptitude by Pearson Publications

Course Outcomes:

1. Identify and correct errors in English grammar and sentence construction
2. Identify and correct errors in Structure, Style and Composition
3. Solve problems in Combinatorics, Cryptarithmetic, and Modular Arithmetic
4. Solve problems in Mental Ability and Algebra

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1							3				
CO2							3				
CO3	3						3				
CO4	3						3				
CO5											

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :17-09-2021 **ACADEMIC COUNCIL:17-09-2021**

SDG No. & Statement:4

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

SDG Justification:

English language and quantitative aptitude skills are essential skills for achieving inclusive and equitable education and lifelong learning opportunities for oneself and others.

CLAD2001	PREPARATION FOR CAMPUS PLACEMENT -1 (SOFT SKILLS 5A)	L	T	P	S	J	C
		0	0	2	0	0	1
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

The course addresses all relevant areas related to campus placements and readies them to ace their upcoming/ ongoing recruitment drives. Specifically, it focuses on students' career preparedness, interview skills, test preparedness, etc.

Course Educational Objectives:

Prepare the students for their upcoming/ ongoing campus recruitment drives.

List of Activities & Tasks for Assessment:

1. Career Preparedness: Resume & Cover Letter Writing, Interview Skills: Elevator Pitch, Making the First Impression, Being Other-Oriented, Being Positive and Curious, communicating with Confidence and Poise, Frequently Asked Questions & How to Answer Them, Pitfalls to Avoid, Etc. Etiquette: Hygiene, Courtesy, Culture differences, Workplace, use of cell phone, Profanity, Slang, Protocol.
2. Verbal Ability: Practicing Reading Comprehension, Error Detection, Sentence Completion, MCQs, FIBs, Para jumbles, Cloze Test, Critical Reasoning.
3. Quantitative Aptitude: Number Systems, Algebra, Geometry, Data Handling, Data Sufficiency, Word Problems
4. Reasoning: Logical and Verbal Reasoning

References:

1. Verbal Ability & Reading Comprehension by Arun Sharma and MeenakshiUpadhyay
2. Study material for CAT, SAT, GRE, GMAT by TIME, CareerLauncher and IMSetc.
3. Quantitative Aptitude by R S Agarwal S Chand Publications
4. Quantitative Aptitude by Pearson Publications

Course Outcomes:

1. Write a power resume and covering letter
2. Answer interview questions with confidence and poise
3. Exhibit appropriate social mannerisms in interviews
4. Solve placement test questions on verbal ability, quantitative aptitude and reasoning

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1		1					3				
CO2		3					3				
CO3	3						3				
CO4	3						3				
CO5											

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :17-09-2021 **ACADEMIC COUNCIL:17-09-2021**

SDG No. & Statement:4

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

SDG Justification:

Quantitative aptitude, reasoning, verbal and language skills practiced during the preparation for campus placement tests provide essential skills for achieving inclusive and equitable education and lifelong learning opportunities for oneself and others.

CLAD2011	PREPARATION FOR HIGHER EDUCATION (GRE/ GMAT)-1 (SOFT SKILLS 5B)	L	T	P	S	J	C
		0	0	2	0	0	1
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

The course offers a special track for students who aspire to go abroad in pursuit of their higher education for which a GRE/ GMAT score is a prerequisite. It covers all four topical areas of these tests and includes fully solved mock tests as well.

Course Educational Objectives:

- Prepare the students to solve questions from all four broad areas of GRE/ GMAT
- Orient the students for GRE/ GMAT through mock tests

List of Activities & Tasks for Assessment:

1. Verbal Reasoning: Reading Comprehension, Sentence Equivalence, TextCompletion, Sentence Correction, Critical Reasoning
2. Quantitative Reasoning: Arithmetic, Algebra, Geometry, Data Analysis
3. Analytical Writing Assessment: Issue/ Argument
4. Integrated Reasoning

References:

1. Verbal Ability & Reading Comprehension by Arun Sharma and MeenakshiUpadhyay
2. Study material for CAT, SAT, GRE, GMAT by TIME, CareerLauncher and IMSetc.
3. Quantitative Aptitude by R S Agarwal S Chand Publications
4. Quantitative Aptitude by Pearson Publications

Course Outcomes:

1. Solve questions from all four broad areas of GRE/ GMAT
2. Practice answering several mock tests

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3			2			3				
CO2	3			2			3				
CO3											
CO4											
CO5											

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :17-09-2021 **ACADEMIC COUNCIL:17-09-2021**

SDG No. & Statement:4

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

SDG Justification:

Quantitative aptitude, reasoning, verbal and language skills practiced during the preparation for GRE/GMAT tests provide essential skills for achieving inclusive and equitable education and lifelong learning opportunities for oneself and others.

CLAD2021	PREPARATION FOR CAT/ MAT – 1 (SOFT SKILLS 5C)	L	T	P	S	J	C
		0	0	2	0	0	1
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

The course offers a special track for UG students who aspire to go for higher education in business management in India for which cracking CAT/ MAT/ other related test is mandatory. It covers all four topical areas of these tests and includes fully solved mock testsas well.

Course Educational Objectives:

- Prepare the students to solve questions from all four relevant areas of CAT/ XAT/MAT, etc.
- Orient the students for CAT/ XAT, etc. through mock tests

List of Activities & Tasks for Assessment:

1. Quantitative Ability: Arithmetic, Algebra, Geometry, Mensuration, Calculus, Trigonometry
2. Data Interpretation: Data Interpretation and Data Sufficiency
3. Logical Reasoning: Data Management, Deductions, Verbal Reasoning and Non-Verbal Reasoning
4. Verbal Ability: Critical Reasoning, Sentence Correction, Para Completion, Para Jumbles, Reading Comprehension

References:

1. Verbal Ability & Reading Comprehension by Arun Sharma and Meenakshi Upadhyay
2. Study material for CAT, SAT, GRE, GMAT by TIME, Career Launcher andIMS etc.
3. Quantitative Aptitude by R S Agarwal S Chand Publications
4. Quantitative Aptitude by Pearson Publications

Course Outcomes:

1. Solve questions from all four relevant areas of CAT/ MAT as listed above
2. Practice test-cracking techniques through relevant mock tests

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3			2			3				
CO2	3			2			3				
CO3											
CO4											
CO5											

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :17-09-2021 **ACADEMIC COUNCIL:17-09-2021**

SDG No. & Statement:4

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

SDG Justification:

Quantitative aptitude, reasoning, verbal and language skills practiced during the preparation for CAT/ MAT tests provide essential skills for achieving inclusive and equitable education and lifelong learning opportunities for oneself and others.

CLAD2031	PREPARATION FOR CAMPUS PLACEMENT-2 (SOFT SKILLS 6A)	L	T	P	S	J	C
		0	0	2	0	0	1
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course builds on the previous course and focuses on all four major areas of campus placements, including career preparedness, mock interviews, verbal ability, quantitative aptitude, and logical reasoning.

Course Educational Objectives:

- To comprehensively prepare all eligible and aspiring students for landing their dream jobs.
- To sharpen the test-taking skills in all four major areas of all campus drives

List of Activities & Tasks for Assessment:

1. Career Preparedness II: Mock Interviews, Feedback and Placement Readiness
2. Verbal Ability II: Practising Reading Comprehension, Error Detection, Sentence Completion, MCQs, FIBs, Para jumbles, Cloze Test, Critical Reasoning
3. Quantitative Aptitude II: Number Systems, Algebra, Geometry, Data Handling,Data Sufficiency, Word Problems
4. Reasoning II: Logical and Verbal Reasoning

References:

1. Verbal Ability & Reading Comprehension by Arun Sharma and Meenakshi Upadhyay
2. Study material for CAT, SAT, GRE, GMAT by TIME, CareerLauncher and IMSetc.
3. Quantitative Aptitude by R S Agarwal S Chand Publications
4. Quantitative Aptitude by Pearson Publications

Course Outcomes:

1. Demonstrate career preparedness and confidence in tackling campus interviews
2. Solve placement test questions of a higher difficulty level in verbal ability, quantitative aptitude and logical reasoning.
3. Practice test-taking skills by solving relevant questions accurately and within time.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1		3	3				3				
CO2							3				
CO3							3				
CO4											
CO5											

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :17-09-2021 **ACADEMIC COUNCIL:17-09-2021**

SDG No. & Statement:4

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

SDG Justification:

Quantitative aptitude, reasoning, verbal and language skills practiced during the preparation for campus placement tests provide essential skills for achieving inclusive and equitable education and lifelong learning opportunities for oneself and others.

CLAD2041	PREPARATION FOR HIGHER EDUCATION (GRE/GMAT)-2 (SOFT SKILLS 6B)	L	T	P	S	J	C
		0	0	2	0	0	1
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

The course offers a special track for students who aspire to go abroad in pursuit of theirhigher education for which a GRE/ GMAT score is a prerequisite. It covers all four topical areas of these tests at a higher difficulty-level and includes fully solved mock tests as well.

Course Educational Objectives:

- Prepare the students to solve higher level questions from all four broad areas of GRE/ GMAT
- Orient the students for GRE/ GMAT through mock tests

List of Activities & Tasks for Assessment:

1. Verbal Reasoning II: Reading Comprehension, Sentence Equivalence, Text Completion, Sentence Correction, Critical Reasoning
2. Quantitative Reasoning II: Arithmetic, Algebra, Geometry, Data Analysis
3. Analytical Writing Assessment II: Issue/ Argument
4. Integrated Reasoning II

References:

1. Verbal Ability & Reading Comprehension by Arun Sharma and MeenakshiUpadhyay
2. Study material for CAT, SAT, GRE, GMAT by TIME, CareerLauncher and IMSetc.
3. Quantitative Aptitude by R S Agarwal S Chand Publications
4. Quantitative Aptitude by Pearson Publications

Course Outcomes:

1. Solve higher level questions from all four broad areas of GRE/ GMAT
2. Practice answering several mock tests

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2						3				
CO2	2						3				
CO3											
CO4											
CO5											

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :17-09-2021 **ACADEMIC COUNCIL:17-09-2021**

SDG No. & Statement:4

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

SDG Justification:

Quantitative aptitude, reasoning, verbal and language skills practiced during the preparation for GRE/GMAT tests provide essential skills for achieving inclusive and equitable education and lifelong learning opportunities for oneself and others.

CLAD2051	PREPARATION FOR CAT/ MAT – 2 (SOFT SKILLS 6C)	L	T	P	S	J	C
		0	0	2	0	0	1
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

The course offers a special track for UG students who aspire to go for higher education in business management in India for which cracking CAT/ MAT/ other related test is mandatory. It covers all four topical areas of these tests at a higher level of difficulty and includes fully solved mock tests as well.

Course Educational Objectives:

- Prepare the students to solve all types of questions from all four relevant areas of CAT/ XAT/ MAT, etc.

List of Activities & Tasks for Assessment:

1. Quantitative Ability II: Arithmetic, Algebra, Geometry, Mensuration, Calculus, Trigonometry
2. Data Interpretation II: Data Interpretation and Data Sufficiency
3. Logical Reasoning II: Data Management, Deductions, Verbal Reasoning and Non-Verbal Reasoning
4. Verbal Ability II: Critical Reasoning, Sentence Correction, Para Completion, Para Jumbles, Reading Comprehension

References:

1. Verbal Ability & Reading Comprehension by Arun Sharma and MeenakshiUpadhyay
2. Study material for CAT, SAT, GRE, GMAT by TIME, CareerLauncher and IMSetc.
3. Quantitative Aptitude by R S Agarwal S Chand Publications
4. Quantitative Aptitude by Pearson Publications

Course Outcomes:

1. Solve higher difficulty level questions from all four relevant areas of CAT/ MAT aslisted above
2. Practice test-cracking techniques through relevant mock tests

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2			2			3				
CO2	2			2			3				
CO3											
CO4											
CO5											

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :17-09-2021 **ACADEMIC COUNCIL:17-09-2021**

SDG No. & Statement:4

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

SDG Justification:

Quantitative aptitude, reasoning, verbal and language skills practiced during the preparation for CAT/ MAT tests provide essential skills for achieving inclusive and equitable education and lifelong learning opportunities for oneself and others.

DOSL1001	CLUB ACTIVITY – PARTICIPANT	L	T	P	S	J	C
		0	0	0	2	0	2
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course recognizes student participation in multiple activities organized by various student organizations that pursue specific co-curricular and extra-curricular interests. These activities allow students to engage in and identify and pursue their personal interests and hobbies.

Course Educational Objectives:

- Create opportunities for students to participate in a variety of non-academic experiences
- Interact with and learn from peers in a setting without an external performance pressure
- Allow exploration of interesting activities and reflection about these experiences
- Learn to manage time effectively

List of Student Club Activities:

1. Music (vocals, instruments, technical, recording, mixing, production, management)
2. Dance (Indian classical, western, jazz, latin, contemporary, folk, production, event management)
3. Theatre (classical, experimental, one-act, street, production, direction, casting, etc.)
4. Arts (fine arts, painting, calligraphy, sketching, caricaturing, etc)
5. Craft (origami, model making, sculpture, pottery, etc)
6. Cooking (home-style, baking, confectionery, Indian, intercontinental, etc.)
7. Graffiti (street, mural, collage, multi media, etc)
8. Workshops, quizzes, debates, elocution, etc
9. Filmmaking (adventure, drama, film appreciation, documentary, etc)
10. Photography (conventional, immersive (360), landscape, portrait, technical, editing, etc.)
11. College Fests
12. Designing (graphic design, landscape, interior, etc)
13. Competitive coding
14. Recreational sports activities
15. Other club activities organized by student clubs

List of Activities:

1. Participation in various club-based activities
2. Weekly reflection paper
3. Portfolio (on social media using an Instagram account)
4. Two learning papers (one per semester)

Textbooks:

1. Small move: big Change (Caroline Arnold)
2. How to Win at College: Surprising Secrets for Success from the Country's Top Students (Cal Newport)

References:

1. Making the most of college: Students speak their minds (author - Richard Light)
2. Failing Forward: Turning Mistakes into Stepping Stones for Success (John C Maxwell)
3. The Last Lecture (Randy Pausch)
4. Lean in (Sheryl Sandberg)
5. YouTube- Introduction to various club activities

Course Outcomes:

Upon successful completion of the course, student will be able to

1. Identify personal interest areas
2. Learn from diverse perspectives and experiences
3. Gain exposure to various activities and opportunities for extra-curicular activities
4. Learn to manage time effectively
5. gain confidence

CO-PO Mapping:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	3	3	3	3	2		2				
CO2	3		3		2		2				
CO3		3	2		3	2					
CO4		3	3		2		3				
CO5	3		3		2		3				

Note: 1 - Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :19-07-2021 **ACADEMIC COUNCIL:19-07-2021**

SDG No. & Statement:

SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

SDG Justification:

This course recognizes student participation in non-academic events and activities which focus on inclusive partnerships and collaborations with all stakeholders by using all sustainable means to promote lifelong learning.

DOSL1011	CLUB ACTIVITY – MEMBER OF THE CLUB	L	T	P	S	J	C
		0	0	0	2	0	2
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course encourages and acknowledges student members' work in organizing events and activities organized by various student organizations that pursue specific co-curricular and extra- curricular interests. These activities allow students to actively learn from the process of conceptualizing and organizing such activities as part of a team.

Course Educational Objectives:

- Create opportunities for students to learn from organizing club activities
- Learn teamwork, leadership, planning and management of events and activities
- Learn to appreciate multiple perspectives, cultures, and individual capabilities
- Learn to manage time effectively

List of Student Club Activities:

1. Music (vocals, instruments, technical, recording, mixing, production, management)
2. Dance (Indian classical, western, jazz, latin, contemporary, folk, production, event management)
3. Theatre (classical, experimental, one-act, street, production, direction, casting, etc.)
4. Arts (fine arts, painting, calligraphy, sketching, caricaturing, etc)
5. Craft (origami, model making, sculpture, pottery, etc)
6. Cooking (home-style, baking, confectionery, Indian, intercontinental, etc.)
7. Graffiti (street, mural, collage, multi media, etc)
8. Workshops, quizzes, debates, elocution, etc
9. Filmmaking (adventure, drama, film appreciation, documentary, etc)
10. Photography (conventional, immersive (360), landscape, portrait, technical, editing, etc.)
11. College Fests
12. Designing (graphic design, landscape, interior, etc)
13. Competitive coding
14. Recreational sports activities
15. Other club activities organized by student clubs

List of Activities:

1. Be a member of a club and organize activities in that particular interest area
2. Learn from diverse perspectives and experiences
3. Learn to design and execute extra-curricular activities
4. Develop management skills through hands on experience
5. Explore different managerial roles and develop competencies

Textbooks:

1. Small move: big Change (Caroline Arnold)
2. How to Win at College: Surprising Secrets for Success from the Country's Top Students (Cal Newport)

References:

1. Making the most of college: Students speak their minds (author - Richard Light)
2. Failing Forward: Turning Mistakes into Stepping Stones for Success (John C Maxwell)
3. The Last Lecture (Randy Pausch)
4. Lean in (Sheryl Sandberg)
5. Youtube- Introduction to various club activities

Course Outcomes:

Upon successful completion of the course, student will be able to

- Be a member of a club and organize activities in that particular interest area
- Learn from diverse perspectives and experiences
- Learn to design and execute extra-curricular activities
- Develop management skills through hands on experience
- Explore different managerial roles and develop competencies

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	2		2				
CO2	3		3		2		2				
CO3		3	2		3	2					
CO4		3	3		2		3				
CO5	3		3		2		3				

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :19-07-2021 **ACADEMIC COUNCIL:19-07-2021**

SDG No. & Statement:

SDG 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

SDG17 : Strengthen the means of implementation and revitalize the global partnership for sustainable development

SDG Justification:

This course recognizes student participation in community service endeavours focussing on sustainable development, service to communities. This allows students to develop empathy, citizenship behaviour and inclusive community values.

DOSL1021	CLUB ACTIVITY – LEADER OF THE CLUB	L	T	P	S	J	C
		0	0	0	2	0	2
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course encourages and recognizes student members' work in leading the student organizationsthrough various leadership roles. As leaders they work not just to organize events and activities in specific co-curricular and extra-curricular interests, but also lead the teams that form the core members of the clubs. These activities allow students to learn and practice leadership and management skills through real world experience.

Course Educational Objectives:

- Create opportunities for students to learn from organizing club activities
- Learn teamwork, leadership, planning and management of events and activities
- Learn to appreciate multiple perspectives, cultures, and individual capabilities
- Learn to manage time effectively

List of Student Club Activities:

1. Music (vocals, instruments, technical, recording, mixing, production, management)
2. Dance (Indian classical, western, jazz, latin, contemporary, folk, production, event management)
3. Theatre (classical, experimental, one-act, street, production, direction, casting, etc.)
4. Arts (fine arts, painting, calligraphy, sketching, caricaturing, etc)
5. Craft (origami, model making, sculpture, pottery, etc)
6. Cooking (home-style, baking, confectionery, Indian, intercontinental, etc.)
7. Graffiti (street, mural, collage, multimedia, etc)
8. Workshops, quizzes, debates, elocution, etc
9. Filmmaking (adventure, drama, film appreciation, documentary, etc)
10. Photography (conventional, immersive (360), landscape, portrait, technical, editing, etc.)
11. College Fests
12. Designing (graphic design, landscape, interior, etc)
13. Competitive coding
14. Recreational sports activities
15. Other club activities organized by student clubs

List of Activities:

1. Be the leader of the club and implement the charter, vision and mission of the club
2. Learn from diverse perspectives and experiences
3. Learn to lead the team, design and execute extra-curricular activities
4. Develop management skills through hands on experience
5. Explore different managerial roles and develop competencies

Textbooks:

1. Small move: big Change (Caroline Arnold)
2. How to Win at College: Surprising Secrets for Success from the Country's Top Students(Cal Newport)

References:

1. Making the most of college: Students speak their minds (author - Richard Light)
2. Failing Forward: Turning Mistakes into Stepping Stones for Success (John C Maxwell)
3. The Last Lecture (Randy Pausch)
4. Lean in (Sheryl Sandberg)
5. Youtube- Introduction to various club activities

Course Outcomes:

Upon successful completion of the course, student will be able to

- Be the leader of the club and implement the charter, vision and mission of the club
- Learn from diverse perspectives and experiences
- Learn to lead the team, design and execute extra-curricular activities
- Develop management skills through hands on experience
- Explore different managerial roles and develop competencies

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	2		2				
CO2	3		3		2		2				
CO3		3	2		3	2					
CO4		3	3		2		3				
CO5	3		3		2		3				

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :19-07-2021 **ACADEMIC COUNCIL:19-07-2021**

SDG No. & Statement:

SDG 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

SDG17 : Strengthen the means of implementation and revitalize the global partnership for sustainable development

SDG Justification:

This course recognizes student participation in community service endeavours focussing on sustainable development, service to communities. This allows students to develop empathy, citizenship behaviour and inclusive community values.

DOSL1031	CLUB ACTIVITY – COMPETITOR	L	T	P	S	J	C
		0	0	0	2	0	2
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course encourages and recognizes student members' work in leading the student organizationsthrough various leadership roles. As leaders they work not just to organize events and activities in specific co-curricular and extra-curricular interests, but also lead the teams that form the core members of the clubs. These activities allow students to learn and practice leadership and management skills through real world experience.

Course Educational Objectives:

- Create opportunities for students to learn from organizing club activities
- Learn teamwork, leadership, planning and management of events and activities
- Learn to appreciate multiple perspectives, cultures, and individual capabilities
- Learn to manage time effectively

List of Student Club Activities:

1. Music (vocals, instruments, technical, recording, mixing, production, management)
2. Dance (Indian classical, western, jazz, latin, contemporary, folk, production, event management)
3. Theatre (classical, experimental, one-act, street, production, direction, casting, etc.)
4. Arts (fine arts, painting, calligraphy, sketching, caricaturing, etc)
5. Craft (origami, model making, sculpture, pottery, etc)
6. Cooking (home-style, baking, confectionery, Indian, intercontinental, etc.)
7. Graffiti (street, mural, collage, multimedia, etc)
8. Workshops, quizzes, debates, elocution, etc
9. Filmmaking (adventure, drama, film appreciation, documentary, etc)
10. Photography (conventional, immersive (360), landscape, portrait, technical, editing, etc.)
11. College Fests
12. Designing (graphic design, landscape, interior, etc)
13. Competitive coding
14. Recreational sports activities

15. Other club activities organized by student clubs

List of Activities:

1. Be the leader of the club and implement the charter, vision and mission of the club
2. Learn from diverse perspectives and experiences
3. Learn to lead the team, design and execute extra-curicular activities
4. Develop management skills through hands on experience
5. Explore different managerial roles and develop competencies

Textbooks:

1. Small move: big Change (Caroline Arnold)
2. How to Win at College: Surprising Secrets for Success from the Country's Top Students (Cal Newport)

References:

1. Making the most of college: Students speak their minds (author - Richard Light)
2. Failing Forward: Turning Mistakes into Stepping Stones for Success (John C Maxwell)
3. The Last Lecture (Randy Pausch)
4. Lean in (Sheryl Sandberg)
5. Youtube- Introduction to various club activities

Course Outcomes:

Upon successful completion of the course, student will be able to

1. Be the leader of the club and implement the charter, vision and mission of the club
2. Learn from diverse perspectives and experiences
3. Learn to lead the team, design and execute extra-curricular activities
4. Develop management skills through hands on experience
5. Explore different managerial roles and develop competencies

CO-PO Mapping:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	3	3	3	3	2		2				
CO2	3		3		2		2				
CO3		3	2		3	2					
CO4		3	3		2		3				
CO5	3		3		2		3				

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :19-07-2021 **ACADEMIC COUNCIL:19-07-2021**

SDG No. & Statement:

SDG 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

SDG17 : Strengthen the means of implementation and revitalize the global partnership for sustainable development

SDG Justification:

This course recognizes student participation in community service endeavours focussing on sustainable development, service to communities. This allows students to develop empathy, citizenship behaviour and inclusive community values.

DOSL1041	COMMUNITY SERVICES - VOLUNTEER	L	T	P	S	J	C
		0	0	0	0	2	2
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course recognizes student participation in Community service activities organized by various student organizations and other Government and non-government organizations that exist for providing service to communities. These activities allow students to develop empathy, citizenship behaviour and community values.

Course Educational Objectives:

- To help students develop empathy and citizenship behavior
- Enable students to develop an altruistic attitude and community development sensibility
- Allow exploration of community service activities and reflect about these experiences
- Learn to work in small and large teams for achieving community objectives

List of Community Service Activities:

1. Community Health Services
2. Swachh Bharat Abhiyan and other Cleanliness drives
3. Tree Plantation and similar environmental conservation initiatives
4. Rain water harvesting awareness and implementation
5. Fundraising and visits to Orphanages, Old-age homes, etc.
6. Health and disease awareness programs
7. Working with NGOs
8. Disaster mitigation and management training and relief work
9. Rural Upliftment projects
10. Campus awareness and action projects (cleanliness, anti-ragging, blood donation, etc)
11. Community investigations and surveys for development research
12. Educational support for underprivileged (remedial classes, coaching, training, etc)
13. Service camps
14. Advocacy and information literacy initiatives
15. Other activities serving local communities

List of Activities:

1. Participation in various community service activities
2. Weekly reflection paper
3. Portfolio (on social media using an instagram account)
4. Two learning papers (one per semester)

Text Books:

1. Soul of a citizen: living with conviction in Challenging times (author: Paul Rogat Loeb)
2. Community Services intervention: Vera Lloyd

References:

1. A path appears: Transforming lives, creating opportunities (Nicholas Kristof and SherylWuDunn)
2. The story of My Experiments with Truth (author: M. K. Gandhi)

Course Outcomes:

1. Experience of volunteering in a variety of Community service activities
2. Gaining empathy for lesser privileged sections of society by experience
3. Understanding the process of generating community awareness
4. Understanding Disaster management and relief through training and experience
5. Developing environmental and sustainability awareness

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	3					2				
CO2		3	3				2				
CO3				3	3	2	2				
CO4		3	3								
CO5	3		3				3				

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :19-07-2021 **ACADEMIC COUNCIL:19-07-2021**

SDG No. & Statement:

SDG 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

SDG17 : Strengthen the means of implementation and revitalize the global partnership for sustainable development

SDG Justification:

This course recognizes student participation in community service endeavours focussing on sustainable development, service to communities. This allows students to develop empathy, citizenship behaviour and inclusive community values.

DOSL1051	COMMUNITY SERVICES - MOBILIZER	L	T	P	S	J	C
		0	0	0	0	2	2
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course recognizes student leadership in mobilizing community service activities as members of various student organizations or other Government and non-government organizations that existfor providing service to communities. These activities allow students to develop leadership, management skills, empathy, citizenship behavior and community values.

Course Educational Objectives:

- To help students understand leadership in a community environment
- Enable students to develop an altruistic attitude and community development sensibility
- Allow deep understanding of community service through practical experience
- Learn to lead small and large teams for achieving community objectives

List of Community Service Activities:

1. Community Health Services
2. Swachh Bharat Abhiyan and other Cleanliness drives
3. Tree Plantation and similar environmental conservation initiatives
4. Rain water harvesting awareness and implementation
5. Fundraising and visits to Orphanages, Old-age homes, etc.
6. Health and disease awareness programs
7. Working with NGOs
8. Disaster mitigation and management training and relief work
9. Rural Upliftment projects
10. Campus awareness and action projects (cleanliness, anti-ragging, blood donation, etc)
11. Community investigations and surveys for development research
12. Educational support for underprivileged (remedial classes, coaching, training, etc)
13. Service camps
14. Advocacy and information literacy initiatives
15. Other activities serving local communities

List of Activities:

1. Organizing and leading teams in various community service activities
2. Fortnightly reflection paper
3. Portfolio (on social media using an 45nstagram account)
4. Two learning papers (one per semester)

Textbooks:

1. Soul of a citizen: living with conviction in Challenging times (author: Paul Rogat Loeb)
2. Community Services intervention: Vera Lloyd

References:

1. A path appears: Transforming lives, creating opportunities (Nicholas Kristof and SherylWuDunn)
2. The story of My Experiments with Truth (author: M. K. Gandhi)
3. List of student run and other Government and non- government community service organizations

Course Outcomes:

1. Experience of mobilizing and executing Community service activities
2. Providing opportunities for community service volunteering for other fellowstudents
3. Understanding the process of mobilizing cash, kind and volunteer support
4. Building leadership and management skills
5. Building empathy and citizenship behavior

CO-PO Mapping:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	3	3					2				
CO2		3	3				2				
CO3				3	3	2	2				
CO4		3	3								
CO5	3		3				3				

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :19-07-2021 **ACADEMIC COUNCIL:19-07-2021**

SDG No. & Statement:

SDG 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

SDG17 : Strengthen the means of implementation and revitalize the global partnership for sustainable development

SDG Justification:

This course recognizes student participation in community service endeavours focussing on sustainable development, service to communities. This allows students to develop empathy, citizenship behaviour and inclusive community values.

DOSP1001	BADMINTON	L	T	P	S	J	C
		0	0	0	2	0	2
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course provides instruction and the opportunity for participation in sports and physical fitness activities. Skills, strategies, rules, and personal wellness goals are included as appropriate. This course will provide students with an understanding of the fundamental concepts of the physiological functions and training principles associated with the chosen sport.

Course Educational Objectives:

- Understand training principles used in the sport
- Demonstrate knowledge of the game in a recreational /competitive play setting
- Organize an event around the sport
- Demonstrate concepts of warm up, game conditioning, training plans

List of Activities:

1. Watch a sport documentary / training video / game history
2. On field coaching and demonstration session
3. Guided practice and play
4. Event management & game officiating
5. Friendly competitions and structured matches

Instructional Plan:

1. Introduction to Badminton - History and development
2. Rules of the Game, Play Area & dimensions
3. Fundamental Skills - Badminton: Grips - Racket, shuttle
4. Sports Specific fitness and warmup drills
5. Stances and footwork
6. Badminton Gameplay: Service, Forehand, Backhand
7. Preparatory Drills and Fun Games
8. Game Variations: Singles/ Doubles/ Mixed

References:

1. Handbook of the Badminton World Federation (BWF)

Course Outcomes:

1. Learn to play Badminton
2. Understanding of the fundamental concepts such as rules of play, game variations
3. Understanding of the governing structure and administration of the sport
4. Understand the event management of the sport
5. Apply sport concepts into an active physical lifestyle

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2				3				
CO2							2				
CO3							2				
CO4		3	3		2		2				
CO5				3	2		3				

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :19-07-2021 **ACADEMIC COUNCIL:19-07-2021**

SDG No. & Statement:4

Good Health and Well-being: Ensure healthy lives and promote well-being for all at all ages.

SDG Justification:

The nature of the course facilitates students to engage in various forms of fitness activities and sports-related movements that work on their overall health and wellness. The course focuses on inculcating active living as a lifestyle by making sports fun, engaging and meaningful.

OSP1011	CHESS	L	T	P	S	J	C
		0	0	0	2	0	2
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course provides instruction and the opportunity for participation in sports and physical fitness activities. Skills, strategies, rules, and personal wellness goals are included as appropriate. This course will provide students with an understanding of the fundamental concepts of the physiological functions and training principles associated with the chosen sport.

Course Educational Objectives:

- Understand training principles used in the sport
- Demonstrate knowledge of the game in a recreational /competitive play setting
- Organize an event around the sport
- Demonstrate concepts of warm up, game conditioning, training plans

List of Activities:

1. Watch a sport documentary / training video / game history
2. On field coaching and demonstration session
3. Guided practice and play
4. Event management & game officiating
5. Friendly competitions and structured matches

Instructional Plan:

1. Introduction to Chess - History and development
2. Rules of the Game, Play Area & dimensions
3. Fundamental Skills - Chess: Pieces & functions, basic play
4. Chess board moves & terminology
5. Chess Gameplay: Openings, castling, strategies & tactics
6. Preparatory Drills and Fun Games
7. Game Variations & Officiating

References:

1. International Chess Federation (FIDE) Handbook

Course Outcomes:

1. Learn to play Chess
2. Understanding of the fundamental concepts such as rules of play, game variations
3. Understanding of the governing structure and administration of the sport
4. Understand the event management of the sport
5. Apply sport concepts into an active physical lifestyle

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2				3				
CO2							2				
CO3							2				
CO4		3	3		2		2				
CO5				3	2		3				

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :19-07-2021 **ACADEMIC COUNCIL:19-07-2021**

SDG No. & Statement:4

Good Health and Well-being: Ensure healthy lives and promote well-being for all at all ages.

SDG Justification:

The nature of the course facilitates students to engage in various forms of fitness activities and sports-related movements that work on their overall health and wellness. The course focuses on inculcating active living as a lifestyle by making sports fun, engaging and meaningful.

DOSP1021	CARROM	L	T	P	S	J	C
		0	0	0	2	0	2
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course provides instruction and the opportunity for participation in sports and physical fitness activities. Skills, strategies, rules, and personal wellness goals are included as appropriate. This course will provide students with an understanding of the fundamental concepts of the physiological functions and training principles associated with the chosen sport.

Course Educational Objectives:

- Understand training principles used in the sport
- Demonstrate knowledge of the game in a recreational /competitive play setting
- Organize an event around the sport
- Demonstrate concepts of warm up, game conditioning, training plans

List of Activities:

1. Watch a sport documentary / training video / game history
2. On field coaching and demonstration session
3. Guided practice and play
4. Event management & game officiating
5. Friendly competitions and structured matches

Instructional Plan:

1. Introduction to Carrom - History and development
2. Rules of the Game, Board components & dimensions
3. Fundamental Skills - Carrom: - Striking
4. Gameplay – General
5. Preparatory Drills and Fun Games
6. Game Variations: Singles/ Doubles/ Mixed
7. Preparatory Drills and Fun Games

References:

1. Indian Carrom Federation Handbook - Laws

Course Outcomes:

1. Learn to play Carrom
2. Understanding of the fundamental concepts such as rules of play, game variations
3. Understanding of the governing structure and administration of the sport
4. Understand the event management of the sport
5. Apply sport concepts into an active physical lifestyle

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2				3				
CO2							2				
CO3							2				
CO4		3	3		2		2				
CO5				3	2		3				

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :19-07-2021 **ACADEMIC COUNCIL:19-07-2021**

SDG No. & Statement:4

Good Health and Well-being: Ensure healthy lives and promote well-being for all at all ages.

SDG Justification:

The nature of the course facilitates students to engage in various forms of fitness activities and sports-related movements that work on their overall health and wellness. The course focuses on inculcating active living as a lifestyle by making sports fun, engaging and meaningful.

DOSP1031	FOOTBALL	L	T	P	S	J	C
		0	0	0	2	0	2
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course provides instruction and the opportunity for participation in sports and physical fitness activities. Skills, strategies, rules, and personal wellness goals are included as appropriate. This course will provide students with an understanding of the fundamental concepts of the physiological functions and training principles associated with the chosen sport.

Course Educational Objectives:

- Understand training principles used in the sport
- Demonstrate knowledge of the game in a recreational /competitive play setting
- Organize an event around the sport
- Demonstrate concepts of warm up, game conditioning, training plans

List of Activities:

1. Watch a sport documentary / training video / game history
2. On field coaching and demonstration session
3. Guided practice and play
4. Event management & game officiating
5. Friendly competitions and structured matches

Instructional Plan:

1. Introduction to Football - History and development
2. Rules of the Game, Play Area & dimensions
3. Fundamental Skills - Kicking, heading, ball control, Keeping
4. Movement, throwins, tackling, defense, scoring, defense
5. Gameplay- Formations, passing, FKs, CKs, PK, tactics
6. Preparatory Drills and Fun Games
7. Game Variations: Small sided games, 7v7, 11v11

References:

1. FIFA Laws of the Game

Course Outcomes:

1. Learn to play Football
2. Understanding of the fundamental concepts such as rules of play, game variations
3. Understanding of the governing structure and administration of the sport
4. Understand the event management of the sport
5. Apply sport concepts into an active physical lifestyle

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2				3				
CO2							2				
CO3							2				
CO4		3	3		2		2				
CO5				3	2		3				

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :19-07-2021 **ACADEMIC COUNCIL:19-07-2021**

SDG No. & Statement:4

Good Health and Well-being: Ensure healthy lives and promote well-being for all at all ages.

SDG Justification:

The nature of the course facilitates students to engage in various forms of fitness activities and sports-related movements that work on their overall health and wellness. The course focuses on inculcating active living as a lifestyle by making sports fun, engaging and meaningful.

DOSP1041	VOLLEYBALL	L	T	P	S	J	C
		0	0	0	2	0	2
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course provides instruction and the opportunity for participation in sports and physical fitness activities. Skills, strategies, rules, and personal wellness goals are included as appropriate. This course will provide students with an understanding of the fundamental concepts of the physiological functions and training principles associated with the chosen sport.

Course Educational Objectives:

- Understand training principles used in the sport
- Demonstrate knowledge of the game in a recreational /competitive play setting
- Organize an event around the sport
- Demonstrate concepts of warm up, game conditioning, training plans

List of Activities:

1. Watch a sport documentary / training video / game history
2. On field coaching and demonstration session
3. Guided practice and play
4. Event management & game officiating
5. Friendly competitions and structured matches

Instructional Plan:

1. Introduction to Volley - History and development
2. Rules of the Game, Play Area & dimensions
3. Fundamental Skills - Striking, Ball control, Lifting
4. Sports Specific fitness and warmup drills
5. Stances and footwork
6. Preparatory Drills and Fun Games
7. Gameplay: Jumps, strikes, layoffs, attack, defense

References:

1. FIVB - Official Volleyball Rules

Course Outcomes:

1. Learn to play Volleyball
2. Understanding of the fundamental concepts such as rules of play, game variations
3. Understanding of the governing structure and administration of the sport
4. Understand the event management of the sport
5. Apply sport concepts into an active physical lifestyle

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2				3				
CO2							2				
CO3							2				
CO4		3	3		2		2				
CO5				3	2		3				

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :19-07-2021 **ACADEMIC COUNCIL:19-07-2021**

SDG No. & Statement:4

Good Health and Well-being: Ensure healthy lives and promote well-being for all at all ages.

SDG Justification:

The nature of the course facilitates students to engage in various forms of fitness activities and sports-related movements that work on their overall health and wellness. The course focuses on inculcating active living as a lifestyle by making sports fun, engaging and meaningful.

DOSP1051	KABADDI	L	T	P	S	J	C
		0	0	0	2	0	2
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course provides instruction and the opportunity for participation in sports and physical fitness activities. Skills, strategies, rules, and personal wellness goals are included as appropriate. This course will provide students with an understanding of the fundamental concepts of the physiological functions and training principles associated with the chosen sport.

Course Educational Objectives:

- Understand training principles used in the sport
- Demonstrate knowledge of the game in a recreational /competitive play setting
- Organize an event around the sport
- Demonstrate concepts of warm up, game conditioning, training plans

List of Activities:

1. Watch a sport documentary / training video / game history
2. On field coaching and demonstration session
3. Guided practice and play
4. Event management & game officiating
5. Friendly competitions and structured matches

Instructional Plan:

1. Introduction to Kabaddi - History and development
2. Rules of the Game, Play Area & dimensions
3. Fundamental Skills - Raiding, catching
4. Sports Specific fitness and warmup drills
5. Stances and footwork
6. Preparatory Drills and Fun Games
7. Gameplay: Chain system movement

References:

1. Amateur Kabaddi Federation of India (AKFI) - Official Rules
2. Rules of Kabaddi - International Kabaddi Federation

Course Outcomes:

1. Learn to play Kabaddi
2. Understanding of the fundamental concepts such as rules of play, game variations
3. Understanding of the governing structure and administration of the sport
4. Understand the event management of the sport
5. Apply sport concepts into an active physical lifestyle

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2				3				
CO2							2				
CO3							2				
CO4		3	3		2		2				
CO5				3	2		3				

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :19-07-2021 **ACADEMIC COUNCIL:19-07-2021**

SDG No. & Statement:4

Good Health and Well-being: Ensure healthy lives and promote well-being for all at all ages.

SDG Justification:

The nature of the course facilitates students to engage in various forms of fitness activities and sports-related movements that work on their overall health and wellness. The course focuses on inculcating active living as a lifestyle by making sports fun, engaging and meaningful.

DOSP1061	KHO KHO	L	T	P	S	J	C
		0	0	0	2	0	2
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course provides instruction and the opportunity for participation in sports and physical fitness activities. Skills, strategies, rules, and personal wellness goals are included as appropriate. This course will provide students with an understanding of the fundamental concepts of the physiological functions and training principles associated with the chosen sport.

Course Educational Objectives:

- Understand training principles used in the sport
- Demonstrate knowledge of the game in a recreational /competitive play setting
- Organize an event around the sport
- Demonstrate concepts of warm up, game conditioning, training plans

List of Activities:

1. Watch a sport documentary / training video / game history
2. On field coaching and demonstration session
3. Guided practice and play
4. Event management & game officiating
5. Friendly competitions and structured matches

Instructional Plan:

1. Introduction to Kho Kho - History and development
2. Rules of the Game, Play Area & dimensions
3. Fundamental Skills: Sitting, giving Kho, Pole dive
4. Sports Specific fitness and warmup drills
5. Stances and footwork: Running, sitting
6. Gameplay: Running strategies, ring method, chain method
7. Preparatory Drills and Fun Games

References:

1. Khelo India Official Rulebook of Kho Kho

Course Outcomes:

1. Learn to play Kho Kho
2. Understanding of the fundamental concepts such as rules of play, game variations
3. Understanding of the governing structure and administration of the sport
4. Understand the event management of the sport
5. Apply sport concepts into an active physical lifestyle

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2				3				
CO2							2				
CO3							2				
CO4		3	3		2		2				
CO5				3	2		3				

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :19-07-2021 **ACADEMIC COUNCIL:19-07-2021**

SDG No. & Statement:4

Good Health and Well-being: Ensure healthy lives and promote well-being for all at all ages.

SDG Justification:

The nature of the course facilitates students to engage in various forms of fitness activities and sports-related movements that work on their overall health and wellness. The course focuses on inculcating active living as a lifestyle by making sports fun, engaging and meaningful.

DOSP1071	TABLE TENNIS	L	T	P	S	J	C
		0	0	0	2	0	2
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course provides instruction and the opportunity for participation in sports and physical fitness activities. Skills, strategies, rules, and personal wellness goals are included as appropriate. This course will provide students with an understanding of the fundamental concepts of the physiological functions and training principles associated with the chosen sport.

Course Educational Objectives:

- Understand training principles used in the sport
- Demonstrate knowledge of the game in a recreational /competitive play setting
- Organize an event around the sport
- Demonstrate concepts of warm up, game conditioning, training plans

List of Activities:

1. Watch a sport documentary / training video / game history
2. On field coaching and demonstration session
3. Guided practice and play
4. Event management & game officiating
5. Friendly competitions and structured matches

Instructional Plan:

1. Introduction to Table Tennis - History and development
2. Rules of the Game, Play Area & dimensions
3. Fundamental Skills - TT: Grips - Racket, ball
4. Stances and footwork
5. TT Gameplay- Forehand, Backhand, Side Spin, High Toss. Strokes-Push, Chop, Drive, Half Volley, Smash, Drop-shot, Balloon, Flick, Loop Drive.
6. Preparatory Drills and Fun Games
7. Game Variations: Singles/ Doubles/ Mixed

References:

1. Handbook of the International Table Tennis Federation (ITTF)

Course Outcomes:

1. Learn to play Table Tennis
2. Understanding of the fundamental concepts such as rules of play, game variations
3. Understanding of the governing structure and administration of the sport
4. Understand the event management of the sport
5. Apply sport concepts into an active physical lifestyle

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PS01	PSO2	PSO3	PSO4
CO1	3	2	2				3				
CO2							2				
CO3							2				
CO4		3	3		2		2				
CO5				3	2		3				

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :19-07-2021 **ACADEMIC COUNCIL:19-07-2021**

SDG No. & Statement:4

Good Health and Well-being: Ensure healthy lives and promote well-being for all at all ages.

SDG Justification:

The nature of the course facilitates students to engage in various forms of fitness activities and sports-related movements that work on their overall health and wellness. The course focuses on inculcating active living as a lifestyle by making sports fun, engaging and meaningful.

DOSP1081	HANDBALL	L	T	P	S	J	C
		0	0	0	2	0	2
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course provides instruction and the opportunity for participation in sports and physical fitness activities. Skills, strategies, rules, and personal wellness goals are included as appropriate. This course will provide students with an understanding of the fundamental concepts of the physiological functions and training principles associated with the chosen sport.

Course Educational Objectives:

- Understand training principles used in the sport
- Demonstrate knowledge of the game in a recreational /competitive play setting
- Organize an event around the sport
- Demonstrate concepts of warm up, game conditioning, training plans

List of Activities:

1. Watch a sport documentary / training video / game history
2. On field coaching and demonstration session
3. Guided practice and play
4. Event management & game officiating
5. Friendly competitions and structured matches

Instructional Plan:

1. Introduction to Handball - History and development
2. Rules of the Game, Play Area & dimensions
3. Fundamental Skills - Handball: Throwing, Ball control, Movement
4. Sports Specific fitness and warmup drills
5. Stances and footwork: Jumps, dribbles, catching, throws
6. Gameplay: Shots, throws, movements, attack, defense
7. Preparatory Drills and Fun Games

References:

1. International Handball Federation - Rules of the Game & Regulations

Course Outcomes:

1. Learn to play Handball
2. Understanding of the fundamental concepts such as rules of play, game variations
3. Understanding of the governing structure and administration of the sport
4. Understand the event management of the sport
5. Apply sport concepts into an active physical lifestyle

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2				3				
CO2							2				
CO3							2				
CO4		3	3		2		2				
CO5				3	2		3				

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :19-07-2021 **ACADEMIC COUNCIL:19-07-2021**

SDG No. & Statement:4

Good Health and Well-being: Ensure healthy lives and promote well-being for all at all ages.

SDG Justification:

The nature of the course facilitates students to engage in various forms of fitness activities and sports-related movements that work on their overall health and wellness. The course focuses on inculcating active living as a lifestyle by making sports fun, engaging and meaningful.

DOSP1091	BASKETBALL	L	T	P	S	J	C
		0	0	0	2	0	2
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course provides instruction and the opportunity for participation in sports and physical fitness activities. Skills, strategies, rules, and personal wellness goals are included as appropriate. This course will provide students with an understanding of the fundamental concepts of the physiological functions and training principles associated with the chosen sport.

Course Educational Objectives:

- Understand training principles used in the sport
- Demonstrate knowledge of the game in a recreational /competitive play setting
- Organize an event around the sport
- Demonstrate concepts of warm up, game conditioning, training plans

List of Activities:

1. Watch a sport documentary / training video / game history
2. On field coaching and demonstration session
3. Guided practice and play
4. Event management & game officiating
5. Friendly competitions and structured matches

Instructional Plan:

1. Introduction to Basketball - History and development
2. Rules of the Game, Play Area & dimensions
3. Fundamental Skills - Passing, Receiving, Dribbling
4. Sports Specific fitness and warmup drills
5. Stances and footwork: Jumps, dribbles, catching, throws
6. Preparatory Drills and Fun Games
7. Gameplay: Shots, throws, movements, attack, defense

References:

1. FIBA Basketball Official Rules

Course Outcomes:

1. Learn to play Basketball
2. Understanding of the fundamental concepts such as rules of play, game variations
3. Understanding of the governing structure and administration of the sport
4. Understand the event management of the sport
5. Apply sport concepts into an active physical lifestyle

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2				3				
CO2							2				
CO3							2				
CO4		3	3		2		2				
CO5				3	2		3				

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :19-07-2021 **ACADEMIC COUNCIL:19-07-2021**

SDG No. & Statement:4

Good Health and Well-being: Ensure healthy lives and promote well-being for all at all ages.

SDG Justification:

The nature of the course facilitates students to engage in various forms of fitness activities and sports-related movements that work on their overall health and wellness. The course focuses on inculcating active living as a lifestyle by making sports fun, engaging and meaningful.

DOSP1101	TENNIS	L	T	P	S	J	C
		0	0	0	2	0	2
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course provides instruction and the opportunity for participation in sports and physical fitness activities. Skills, strategies, rules, and personal wellness goals are included as appropriate. This course will provide students with an understanding of the fundamental concepts of the physiological functions and training principles associated with the chosen sport.

Course Educational Objectives:

- Understand training principles used in the sport
- Demonstrate knowledge of the game in a recreational /competitive play setting
- Organize an event around the sport
- Demonstrate concepts of warm up, game conditioning, training plans

List of Activities:

1. Watch a sport documentary / training video / game history
2. On field coaching and demonstration session
3. Guided practice and play
4. Event management & game officiating
5. Friendly competitions and structured matches

Instructional Plan:

1. Introduction to Tennis - History and development
2. Rules of the Game, Play Area & dimensions
3. Fundamental Skills - Tennis: Grips - Racket, ball
4. Stances and footwork
5. Gameplay- Forehand, Backhand, Service, volley, smash
6. Preparatory Drills and Fun Games
7. Game Variations: Singles/ Doubles/ Mixed

References:

1. Handbook of the International Tennis Federation (ITF)

Course Outcomes:

1. Learn to play Tennis
2. Understanding of the fundamental concepts such as rules of play, game variations
3. Understanding of the governing structure and administration of the sport
4. Understand the event management of the sport
5. Apply sport concepts into an active physical lifestyle

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2				3				
CO2							2				
CO3							2				
CO4		3	3		2		2				
CO5				3	2		3				

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :19-07-2021 **ACADEMIC COUNCIL:19-07-2021**

SDG No. & Statement:4

Good Health and Well-being: Ensure healthy lives and promote well-being for all at all ages.

SDG Justification:

The nature of the course facilitates students to engage in various forms of fitness activities and sports-related movements that work on their overall health and wellness. The course focuses on inculcating active living as a lifestyle by making sports fun, engaging and meaningful.

DOSP1111	THROWBALL	L	T	P	S	J	C
		0	0	0	2	0	2
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course provides instruction and the opportunity for participation in sports and physical fitness activities. Skills, strategies, rules, and personal wellness goals are included as appropriate. This course will provide students with an understanding of the fundamental concepts of the physiological functions and training principles associated with the chosen sport.

Course Educational Objectives:

- Understand training principles used in the sport
- Demonstrate knowledge of the game in a recreational /competitive play setting
- Organize an event around the sport
- Demonstrate concepts of warm up, game conditioning, training plans

List of Activities:

1. Watch a sport documentary / training video / game history
2. On field coaching and demonstration session
3. Guided practice and play
4. Event management & game officiating
5. Friendly competitions and structured matches

Instructional Plan:

1. Introduction to Throwball - History and development
2. Rules of the Game, Play Area & dimensions
3. Fundamental Skills - Throwing, Receiving
4. Sports Specific fitness and warmup drills
5. Stances and footwork
6. Preparatory Drills and Fun Games
7. Gameplay: Shots, throws, movements, control

References:

1. World Throwball Federation - Rules of the Game

Course Outcomes:

1. Learn to play Throwball
2. Understanding of the fundamental concepts such as rules of play, game variations
3. Understanding of the governing structure and administration of the sport
4. Understand the event management of the sport
5. Apply sport concepts into an active physical lifestyle

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2				3				
CO2							2				
CO3		3	3				2				
CO4					2		2				
CO5				3	2		3				

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :19-07-2021 **ACADEMIC COUNCIL:19-07-2021**

SDG No. & Statement:4

Good Health and Well-being: Ensure healthy lives and promote well-being for all at all ages.

SDG Justification:

The nature of the course facilitates students to engage in various forms of fitness activities and sports-related movements that work on their overall health and wellness. The course focuses on inculcating active living as a lifestyle by making sports fun, engaging and meaningful.

ENVS1001	ENVIRONMENTAL STUDIES	L	T	P	S	J	C
		3	0	0	0	0	3*
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

The course enables the students to adapt eco-centric thinking and actions rather than human-centric thinking on natural resources, their utilization and conservation. The course also focuses on the importance of ecosystems, biodiversity and their degradation led to pollution. This course helps in finding solutions through application of control measures to combat pollution and legal measures to achieve sustainable development.

Course Educational Objectives:

- To impart knowledge on natural resources and its associated problems.
- To familiarize learners about ecosystem, biodiversity, and their conservation.
- To introduce learners about environment pollution.
- To acquaint learners on different social issues such as conservation of water, green buildingconcept.
- To make learners understand about the present population scenario, its impacts and role ofinformational technology on environment and human health.
- To make learners understand about the importance of field visit.

UNIT 1 Multidisciplinary nature of environmental studies & Natural Resources **10 hours**

Multidisciplinary nature of environmental studies Definition, scope and importance. Need for public awareness. Natural resources and associated problems. Uses and over exploitation of Forest resources, Water resources, Mineral resources, Food resources, Energy resources. Role of an individual in conservation of natural resources.

Activity:

1. Planting tree saplings
2. Identification of water leakage in house and institute-Rectify or report
3. Observing any one day of a week as Car/bike/vehicle free day.

UNIT 2 Ecosystem and biodiversity **10 hours**

Ecosystem: Structure components of ecosystem: Biotic and Abiotic components. Functional components of an ecosystem: Food chains, Food webs, Ecological pyramids, Energy flow in the ecosystem (10% law), Ecological succession.

Biodiversity: Definition, Biogeographical classification of India, Values of biodiversity: consumptive use, productive use, social, ethical, aesthetic. Hot-spots of biodiversity. Threats to biodiversity: habitat loss, poaching, man wildlife conflicts. Conservation of biodiversity: In – situ and Ex-situ

Activity:

1. Visit to Zoological Park-Noting different ecosystem
2. Biodiversity register- Flora and fauna in the campus

UNIT 3 Environmental Pollution 10 hours

Definition Causes, effects, and control measures of: -Air pollution. Water pollution. Soil pollution. Marine pollution. Noise pollution. Nuclear hazards. Solid waste Management: Causes, effects, and control measures. Role of an individual in prevention of pollution. Pollution case studies.

Activity:

1. Visit to treatment plant and documentation.
2. Documentation of segregation of solid waste-Dry and Wet

UNIT 4 Social Issues and the Environment 10 hours

From Unsustainable to Sustainable development Urban problems related to energy. Water conservation, rainwater harvesting, watershed management. Environmental ethics: Issues and possible solutions. Green building concept.

Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies.

Activity:

1. Observing zero hour at individual level-documentation.
2. Eco friendly idols.
3. Rainwater harvesting-creating storage pits in nearby area.

UNIT 5 Human Population and the Environment and Environment Protection Act and Field work 10 hours

Population growth, variation among nations. Environment and human health. HIV/AIDS, Human rights. Value Education. Women and Child Welfare. Role of Information Technology in Environment and human health. Environment Legislation. Air (Prevention and Control of Pollution) Act. Water (Prevention and Control of Pollution) Act. Wildlife Protection Act. Environmental Protection Act, Issues involved in enforcement of environmental legislation.

Activity:

1. Visit to a local polluted site-industry/agriculture
2. Identifying diseases due to inappropriate environmental conditions

Textbook(s):

1. Erach Bharucha. Textbook of environmental studies for undergraduates courses-Universities Press,India Private Limited. 2019.
2. Kaushik A and Kaushik C.P. Perspectives in Environmental Studies. New Age InternationalPublishers Edition-VI. 2018.

3. Dave D Katewa S.S. Textbook of Environmental Studies, 2nd Edition. Cengage Learning India. 2012.

Additional Reading:

1. Benny Joseph. Textbook of Environmental Studies 3rd edition, McGraw Hill Publishing company limited. 2017.

Reference Book(s):

1. McKinney M.L., Schoch R.M., Yonavjak L. Mincy G. Environmental Science: Systems andSolutions. Jones and Bartlett Publishers. 6th Edition. 2017.
2. Botkin D.B. Environmental Science: Earth as a Living Planet. John Wiley and Sons. 5th edition. 2005.

Journal(s):

1. https://www.tandfonline.com/loi/genv20
2. https://library.lclark.edu/envs/corejournals

Website(s):

https://www.ugc.ac.in/oldpdf/modelcurriculum/env.pdf From Climate Science to Action | Coursera

Course Outcomes:

After the completion of the course student will be able to

1. List different natural resources and their uses
2. Summarize the structure and function of terrestrial and aquatic ecosystems.
3. Identify causes, effects, and control measures of pollution (air, water & soil).
4. Function of green building concept.
5. Adapt value education

CO-PO Mapping:

	PO2	PO1	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2							2		
CO2		2				1		2		
CO3			1						1	
CO4				2						1
CO5	1								1	
CO6					2					1

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN: BOS

BOS: 04-07-22 **ACADEMIC COUNCIL:14-07-22**

SDG No. & Statement:

1. SDG-6-Clean water and Sanitation
2. SDG-7-Affordable and clean energy
3. SDG-13 - Climate change
4. SDG-14 - Life below water
5. SDG-15 - Life on Land

SDG Justification:

1. The learner will understand the importance of clean water and sanitation through this course and apply in their daily activities – SDG-6

2. The learner will make use of renewable resources to reduce pollution achieves SDG-7

3. The learner will understand present situation in climate change and takes appropriate steps to combat climate change – SDG-13

4. The learner will understand the existence of life below water – SDG-14

5. The learner will understand to promote sustainable terrestrial ecosystem – SDG15

FINA3001	PERSONAL FINANCIAL PLANNING	L	T	P	S	J	C
		0	0	2	0	0	1*
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	Risk Management in personal financing Fundamentals of Investing Personal and Family Financial Planning Introduction to Personal Finance Portfolio Selection and Risk Management						

Course Description:

Personal Financial Planning is one of the most significant factors in our lives. It is essential that funds are available as and when required at various stages of life. Unavailability of funds at critical stages of our life leads to financial distress and leads to many medical and non- medical problems. There are certain planned and unplanned events in our life. On the one hand, education of our children, their marriage, our retirement etc. are some of the planned events ofour life, but at the same time, some medical urgency, accident or death of an earning member might be some unplanned events. Many of these events are beyond our control, but the availability of funds can be planned to avoid any financial distress. In other words, we cannot stop the rain but can plan for an umbrella.
This course looks at the many challenges an individual faces in a complex financial environment and the rising uncertainties of one's life. It focuses on achieving long-term financial comfort of individual and family through goal setting, developing financial and life strategies, acquiring personal financial planning knowledge and managing risk throughout one's life.

Course Educational Objectives:

- To build students' ability to plan for long-term financial comfort of individual and family through goal setting, developing financial and life strategies.
- To provide students with knowledge on terms, techniques to evaluate investment avenues.
- To build the skill set of the student to enable them to file their tax returns.

UNIT 1 Basics of Financial Planning

Financial Planning Meaning, Need, Objectives, Financial Planning Process, Time Value of Money and its application using excel (NP)

UNIT 2

Risk and Insurance Management

Need for insurance, Requirement of insurance interest, Role of insurance in personal finance, Steps in insurance planning, Life and Non-life insurance products, Life insurance needs analysis (NP)

UNIT 3

Investment Products and Measuring Investment Returns

Investment Products: Small Saving Instruments, Fixed Income Instruments, Alternate Investments, Direct Equity

Measuring Investment Returns: Understanding Return and its concept, Compounding concept, Real vs Nominal Rate of Return, Tax Adjusted Return, Risk-Adjusted Return (NP)

UNIT 4 Retirement Planning

Introduction to the retirement planning process, estimating retirement corpus, Determining the retirement corpus, Retirement Products (NP)

UNIT 5 Tax Planning

Income Tax: Income tax principles: Heads of Incomes, Exemptions and Deductions, Types of Assesses, Rates of Taxation, Obligations for Filing and Reporting, Tax aspects of Investment Products, Wealth Tax

Textbooks:

1. National Institute of Securities Management (NISM) Module 1 & XA
2. Madhu Sinha, Financial Planning, 2 Edition, McGraw Hill India
3. Simplified Financial Management by Vinay Bhagwat, The Times Group

References:

1. Personal Financial Planning (Wealth Management) by S Murali and K R Subbakrishna, Himalaya Publishing House.
2. Mishra K.C., Doss S, (2009). Basics of Personal Financial Planning 1e. National Insurance Academy, New Delhi: Cengage Learning.
3. Risk Analysis, Insurance and Retirement Planning by Indian Institute of Banking and Finance.

Course Outcomes:

1. Describe the financial planning process and application of time value of money
2. Application of life and non-life insurance products in financial planning
3. Understand the investment avenues and analysis of investment returns
4. Understand the retirement planning and its application
5. Describe and analysis the Tax Planning

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	1	0	0	1	0	0	3	1	1	3
CO2	2	2	0	0	1	1	1	3	1	1	2
CO3	3	2	1	0	1	0	0	3	2	2	3
CO4	3	2	0	1	1	0	1	2	2	3	2
CO5	3	3	0	1	1	1	2	1	2	2	3

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS : 01-02-2022 **ACADEMIC COUNCIL: 01-04-2022**

SDG No. & Statement:

SDG Justification:

LANG1001	COMMUNICATION SKILLS IN ENGLISH - BEGINNERS	L	T	P	S	J	C
		0	0	4	0	0	2*
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Communication Skills in English (Beginner) is the first of the three-level courses for a developmental enhancement of learners' communication skills in English. This course focuses on giving learners exposure to factual level of comprehension (listening and reading) and application of the learning (Speaking/Writing) with an awareness for social and personality-based variationsin communication. In addition to the LSRW skills, the focus of the course is on schematic thinking skills. This course is activity-based and practice-oriented in terms of procedural knowledge of vocabulary and grammatical structure. This syllabus is carefully developed to enable learners to engage in communication in English avoiding errors and be prepared for next level of learning English.

Course Educational Objectives:

- Train learners to listen actively, follow what is spoken in standard English, and answer questions to demonstrate their understanding of the main points of the speech, repeat part of what someone has said to confirm mutual understanding, though occasionally, there may be a need to ask for repetition or clarification. (Bloom's Taxonomy Level/s: 2 & 3)
- Equip learners with the skills to read and comprehend straightforward texts and simple argumentative writing to identify the topic, the desired/relevant information, the main points of the argument, and the major conclusion/s. (Bloom's Taxonomy Level/s: 2 & 4)
- Help learners apply their knowledge and language skills to make mini oral presentations and produce short coherent written texts using appropriate cohesive devices, suitable vocabulary, and grammatical structures. (Bloom's Taxonomy Level/s:3)
- Enable learners to communicate with reasonable accuracy in familiar contexts with adequate fluency and generally good control by equipping them with a repertoire of frequently used vocabulary, structures, and speech patterns. (Bloom's Taxonomy Level/s: 2 & 3)

List of Activities & Tasks for Assessment:

1. Listening to others and getting to know their experiences, interests and opinions
2. Introducing oneself: Salutation, basic information, relating to the context
3. Starting a conversation: Salutation, expressing purpose, expressing gratitude
4. Sharing one's experiences, interests and opinions
5. Reading short newspaper articles for gist
6. Picking new words from an article and working on them to know the meaning and usage
7. Using the new (unknown) words in own sentences
8. Sharing news with others - initiate, sustain and conclude
9. Understanding the relevance of intonation to meaning from recorded conversations, and applying the learning in pair work (role play)
10. Writing a summary of a story/personal narrative after listening to it twice and making individual notes
11. Reading graphs, charts and maps for specific information, making note of the important information and talking briefly about it within a small peer group
12. Writing a paragraph about oneself: a brief profile including major successes, failures, and goals. Giving compliments/gratitude to others
13. Writing a paragraph (descriptive, complimentary) about others (Family, friends, role model, etc.)
14. Correcting each other's' drafts: errors in language - word choice, structure, and conventions/etiquette
15. Writing a short structured descriptive/narrative essay in 3 paragraphs, reading others' essays, and sharing feedback

References:

1. V. Sasikumar, P. Kiranmayi Dutt, Geetha Rajeevan. (2007). Listening and Speaking - Foundation Books Cunninhum, S. & Moor, P. (nd). New Cutting Hedge (Intermediate). Longman
2. Cambrdige Academic English: An Integrated Skills Course for EAP (Intermediate) By Craig Thaine, CUP (2012)
3. Rutherford, Andrea J. (2007). Basic Communication Skills for Technology: Second Edition. Delhi: Pearson Education.
4. McCarthy, M., O'Dell, F., Mark, G. (2005). English Vocabulary in Use. Spain: Cambridge University Press.
5. New Headway Academic Skills: Reading, Writing, and Study Skills Student's Book, Level-1 by Sarah Philpot. OUP

6. Philpot, S. & Curnick, L. (2017). Headway: Academic Skills: Reaing, Writing, and Study Skills. Introductory Level. OUP.
7. Thaine, C. (2012). Cambridge Academic English: An Integrated Skills for EAP. Intermediate. CUP.

Online References:

- www.teachingenglish.org.uk
- learnenglishteens.britishcouncil.org
- https://eslflow.com/
- https://www.englishclub.com/
- https://www.oxfordlearnersdictionaries.com/
- https://dictionary.cambridge.org/
- learnenglishteens.britishcouncil.org
- https://freerice.com/categories/english-vocabulary

Course Outcomes:

1. Listen actively, understand and extract the essential information from short talks/conversations/discussions that are delivered in clear, standard speech. (Bloom's Taxonomy Level/s: 2 & 3)
2. Read, understand, and extract specific information from straightforward factual and simple argumentative texts on general topics and subjects of interest. (Bloom's Taxonomy Level/s: 2 & 3)
3. Speak clearly with some confidence on matters related to his/her interests and academic work and make short structured oral presentations on topics of personal interest. (Bloom's Taxonomy Level/s: 3)
4. Write short straightforward connected texts on a range of familiar/general topics using appropriate linking devices to achieve a clear sequence of ideas. (Bloom's Taxonomy Level/s: 3)
5. Acquire sufficient language competency to express oneself in speech and writing with some confidence, using appropriate vocabulary and simple grammatical structures though lexical limitations and/or difficulty with formulation might be evident at times. (Bloom's Taxonomy Level/s: 2 & 4)

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	0	2	2	3	0	0	0				
CO2	0	2	2	3	0	0	0				
CO3	0	0	0	3	0	0	0				
CO4	0	0	0	3	0	0	0				
CO5	0	4	2	0	2	2	4				

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :30-04-2021 **ACADEMIC COUNCIL: 17-09-2021**

SDG No. & Statement:

SDG No. 4: Statement: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

SDG Justification:

The course aims to remove inequalities among admitted students with regard to basic communication skills in English and provide them communication as well as learning skills that are useful throughout their lives.

LANG1011	COMMUNICATION SKILLS IN ENGLISH	L	T	P	S	J	C
		0	0	4	0	0	2
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Communication Skills in English (Intermediate) is the second of the three-level graded courses for a developmental enhancement of communication skills in English. Based on the learning outcomes set in the beginner level syllabus, this course focuses on giving learners more exposure to the use of language for communicative purposes and equip them with next level skills (ref. Bloom's taxonomy) and practice in terms of complexity and cognitive engagement. This course also includes inferential level of comprehension (listening and reading) that involves analysis and application of the language skills and decision-making skills while speaking/writing with an awareness for social and personality-based variations in communication. This course emphasizes guided writing through adequate tasks with pre and post context building. The focus is on stimulation and application of critical thinking in addition to schematic thinking for communication in real-life situations.

Course Educational Objectives:

- Train learners to actively listen to short audio texts with familiar content; guided activity like question-making and responding to others' questions based on the audio text would help learners engage in transactional dialogue; extended activities like extrapolating/critiquing the responses would help learners enhance their schematic thinking. (Bloom's Taxonomy Level/s: 2 & 4)
- Equip learners with strategies to read actively and critically and understand the writers' viewpoints and attitude by providing reading comprehension tasks using authentic texts such as op-ed articles from newspapers, and reports on contemporary problems. (Bloom's Taxonomy Level/s: 4 & 5)
- Help learners understand various aspects and techniques of effective presentations (group/individual) through demonstration and modelling, and enabling them to develop their presentation skills by providing training in using the tips and strategies given. Learners would be encouraged to observe and express opinion on teacher-modelling. Reflection on issues like anxiety, stage-fear, confidence, and levels of familiarity with topic and audience would be addressed. Practice would be given on tone, pitch, clarity and other speech aspects. Detailed peer feedback and instructor's feedback would cover all the significant aspects. (Bloom's Taxonomy Level/s: 2 & 4)
- Enable learners to become aware of the structure and conventions of academic writing through reading, demonstration, scaffolding activities, and discussion.

Corrective individual feedback would be given to the learners on their writing. (Bloom

List of Tasks and Activities:

S.No.	Tasks	Activities
1	Listening to subject related short discussions/explanations/ speech for comprehension	Pre-reading group discussion, Silent reading (Note-making), Modelling (questioning), Post-reading reflection / Presentation
2	Asking for information: asking questions related to the content, context maintaining modalities	Group role-play in a con text (i.e. Identifying the situation and different roles and enacting theirroles)
3	Information transfer: Verbal to visual (familiar context), demonstration by teacher, learners' task (guided with scaffolding), learners' task (free), presentation and feedback	Pair work for discussion & feedback, Presentations, question-answer
4	Information transfer: Visual to verbal (unfamiliar context); demonstration by teacher, learners' task (guided with scaffolding), learners' task (free), presentation and feedback	Pre-reading game/modelling, discussion in small groups, individual writing, and feedback
5	Introducing officials to peers and vice versa -Formal context	AV support, noticing, individual performance (3-4), pair work (in context), teacher modelling, group work for Introducing self and others in a formal context
6	Introducing friends to family and vice versa -Informal context	Teacher modelling/AV support, noticing structure & note-taking, Introducing friends andfamily in an informal context
7	Vocabulary in context: Find clues in a text and use them to guess the meaning of words/ phrases. Apply the newly learnt vocabulary in communication (speaking and writing).	Comprehending verbal communication: Identifying the contextual clues in oral and written texts; guessing the meaning of words/phrases in context while reading texts and listening to discussions/talks

8	A five-day journal (diary) writing based on learners reading from newspaper on a single relevant/ current social issue. Individual oral presentation and feedback from peers andinstructor.	Note-making (group work), Discussion, Feedback
9	Follow the essentials of lectures, talks, discussions, reports and other forms of academicpresentations and mak2 individual and group presentations aided with images, audio, video, tabular data, etc.	Making power point presentation aided with images, audio, video, etc. with a small group by listening to academic lectures/talks/ discussions,etc.
10	Self-reflection: Re-reading one's own drafts, identifying errors, correcting the errors, and givingrationalize the changes	Pre-task discussion/modelling, Editing the texts by careful reading and identifying the errors, peer-exchange (Pair work),feedback/consolidation
11	Collaborative work (speaking and writing) in small groups of 3 or 4 learners: discussing a general/ discipline-specific topic: creating outline, assigning specific roles to members of the group; and group presentation followed by peer and instructor feedback	Pre-task modelling (peer/teacher), general discussion on structure, group work (collaboration), feedback
12	Independent reading of different text types using appropriate reference sources by adapting suitable reading styles and speed. Focus on active reading for vocabulary: low-frequency collocations and idiomatic expressions.	Brain-storming, mapping of key terms (content specific), reading and note-making (individual), oral questioning, discussion
13	Role-play (specific social and academic situations): planning (making notes), understanding nuances of speaking in context, coordinating with situational clues and fellowspeakers/participants	Peer discussion for outline, A-V support, observing (teacher modelling), role play (guided), role-play (free), feedback
14	Writing instructions: Guidelines - Flowcharts - Procedures to be followed	Pre-task reading, pair work, teacher/peer-discussion, feedback

15	Speaking spontaneously on topics of interest and writing short structured essays on the same topics adopting appropriate academic conventions andgrammatical accuracy.	Reading for task preparation, note-making, speaking, reflection and corrective peer and teacher feedback

Reference Books:

1. P. Kiranmayi Dutt, Geetha Rajeevan. (2007). Basic Communication Skills. FoundationBooks. CUP
2. Harmer, J. (1998). How to teach English. Longman
3. Sanjay Kumar & Pushp Lata. (2018). Communication Skills: A Workbook. OUP.
4. Cambridge IGCSE: English as a Second Language Teacher's Book Fourth Edition.By Peter Lucantoni. CUP (2014).
5. Cambrdige Academic English: An Integrated Skills Course for EAP (Upper Intermediate) By Martin Hewings, CUP (2012)
6. Richards, J.C. and Bohlke, D. (2012). Four Corners-3. Cambridge: CUP.
7. Headway Academic Skills: Reading, Writing, and Study Skills Student's Book, Level-2 bySarah Philpot. OUP
8. Latham-Koenig, C. & Oxenden, C. (2014). American English File. Oxfor: OUP.
9. McCarthy, M. & O' Dell. F. (2016). Academic Vocabulary in Use. Cambridge: CUP

Online Resources:

1. https://www.grammarly.com/blog/
2. https://www.nationalgeographic.org/education/
3. https://www.bbc.co.uk/teach/skillswise/english/zjg4scw
4. https://www.englishclub.com/
5. https://www.oxfordlearnersdictionaries.com/
6. https://dictionary.cambridge.org/
7. learnenglishteens.britishcouncil.org
8. https://freerice.com/categories/english-vocabulary
9. http://www.5minuteenglish.com/
10. https://breakingnewsenglish.com/
11. https://www.digitalbook.io/
12. https://librivox.org/

Course Outcomes:

1. Understand the speaker's point of view in fairly extended talks on general or discipline-specifictopics, and follow simple lines of argument in discussions on familiar contemporary issues. (Bloom's Taxonomy Level/s: 3)
2. "Read and demonstrate understanding of articles and reports on limited range of contemporary issues in which the writers adopt particular stances. Also provide samples of written communication containing fairly complex information and reasons

for choices/opinions/stances. (Bloom's Taxonomy Level/s: 2 & 3)"

3. Make short presentations on a limited range of general topics using slides, and engage in smallgroup discussions sharing experiences/views on familiar contemporary issues and give reasonsfor choices/opinions/plans. (Bloom's Taxonomy Level/s: 3 & 4)
4. Write clear, fairly detailed text (a short essay) on a limited range of general topics, and subjectsof interest, and communicate clearly through email/letter to seek/pass on information or give reasons for choices/opinions/plans/actions. (Bloom's Taxonomy Level/s: 3)
5. Reflect on others' performance, give peer feedback on fellow learners' presentations, responsesto writing tasks and reading comprehension questions. (Bloom's Taxonomy Level/s: 5)

CO-PO Mapping:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	0	3	0	3	0	3	0				
CO2	0	2	0	3	2	2	0				
CO3	4	3	3	3	3	3	4				
CO4	0	3	3	3	3	3	0				
CO5	5	0	5	0	0	0	0				

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :30-04-2021 **ACADEMIC COUNCIL: 17-09-2021**

SDG No. & Statement:

SDG No. 4: Statement: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

SDG Justification:

The course aims to remove inequalities among admitted students with regard to basic communication skills in English and provide them communication as well as learning skills that are useful throughout their lives.

LANG1021	ADVANCED COMMUNICATION SKILLS IN ENGLISH	L	T	P	S	J	C
		0	0	4	0	0	2
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Communication Skills in English (Advanced) is the third of the three-level graded courses for a developmental enhancement of communication skills in English. Based on the learning outcomes set in the upper-intermediate syllabus, this course focuses on giving learners exposure to higher level of skills/input processing (ref. Bloom's taxonomy) and practice in terms of complexity and cognitive engagement. This course includes advanced level of comprehension i.e. anaytical, evaluative and extra-polative processing (listening and reading) and involves problem-solving, logical reasoning and decision-making skills in terms of application of the learning (speaking/writing) with an awareness for social and personality based variations in communication. This course provides opportunities with activity-based practice of advanced oral and written communicative skills besides building awareness on the finer nuances of language use for various purposes. This course emhasizes free writing through meaningfully engaging tasks witha pre and post context building. There is ample scope for application of critical thinking through simulated activities for effective communication in real life situations.

Course Educational Objectives:

- Enable learners to listen actively become aware of tone and attitude in speech, and demonstrate their comprehension of fairly complex lines of argument presented by a variety of speakers in talks/presentations/discussions. (Bloom's Taxonomy Level/s: 2 & 4)
- Enable learners to become aware of tone and attitude in written texts, and demonstrate theircomprehension of fairly complex lines of argument and points of view presented in a variety of texts by equipping them with upper intermediate to advanced level reading skillsand strategies. (Bloom's Taxonomy Level/s:2 & 3)
- Make effective presentations, engage in formal group discussions, and write structured essays/ short reports to highlight the significance of actions/decisions/experiences, and sustain views by providing relevant evidence and argument. (Bloom's Taxonomy Level/s:3 & 4)
- Equip learners with the skills and strategies to communicate effectively in speech and writing using the language with a degree of fluency, accuracy and spontaneity, and fairly good grammatical control adopting a level of formality appropriate to the context. Encourage learners to apply their knowledge of language and their

communication skills in real life situations. (Bloom's Taxonomy Level/s:3 & 5)

List of Activities & Tasks for Assessment:

S.No.	Tasks	Activities	CO
1	Evaluative and extrapolative reading of a longtext/short texts on a current topic related to technology and society, identifying and questioning the author's intention, post- reading discussion in small groups, maintaining group dynamics, arriving at a consensus	Pre-reading group discussion, silent reading (Note-making), modelling (questioning), post-reading reflectionand brief presentation of thoughts/ideas/opinions on the themeof the text	3
2	Debate in pairs based on listening to two recorded contemporary speeches by well- known leaders in different fields. Peer feedback and instructor feedback.	Pre-recorded audio/video for listening, student checklist for noticing key words/concepts, pre-task orientation (by teacher), pair work, feedback	1
3	Information transfer: Verbal to visual (unfamiliar context); demonstration by teacher, learners' task (guided with scaffolding), learners' task (free), presentation, question-answer (among students), modification and feedback before the final version is done	Pair work for discussion and feedback, presentations, question-answer	2
4	Information transfer: Visual to verbal (unfamiliar context); demonstration by teacher, learners' task (guided with scaffolding), learners' task (free), presentation, question-answer(among students), modification, editing, proofreading, and feedback before the final version is done	Pre-reading game/ modelling, discussion in small groups, independent writing and feedback	4
5	Expressing opinion on a short argumentative text (e.g. a journal article or a newspaper editorial) and justifying one's opinion/stance; focus on the use of appropriate conventions of formal and polite speech, and managing bias	Listening to group discussions/ debates, reading news-paper articles on the current issues and expressing opinions in favour or against the topic (in GDs, debates or writing argumentativeessays).	3

6	Role-play (complex social and academic/professional situations): Focus on significant aspects of delivery including clarity, tone, and use of contextually appropriate vocabulary and conventions, observation, reflective discussion, and self-reflective writing	Reading newspaper/ magazine articles/ blog posts on current social issues, listening to talks/ discussions/ debates etc. and participating in role-plays using expressions appropriate to the context.	1
7	Collaborative writing in groups of 3 - 4 on topics that would require data collection and reading followed by recorded peer-reflection and peer-feedback, group presentation and feedback	Pre-task modelling (peer), general discussion on structure, group work (collaboration), presnetation, peer feedback, Open-class discussion	5
8	Formal Group Discussion on topics of currentinterest and relevance; focus on effective participation, reflection on control over argument/ counter argument, and adherence to the conventions of formal GD	Noticing strategies from AV modelling, teacher scafolding though open-house discussion, Note-making (Group work), Group Discussion (free), post perfromance discussion, Feedback	2
9	Mind-mapping for advanced reading, making correlations across texts, extending author's point of view	Reading texts on abstract topics and comprehending the author's perspective by inferring the unknown words' meaning in the context and making notes using mind-map strategy and presenting it orally.	3
10	Handling question and answer sessions after presentations: justifying arguments, taking counter-arguments, agreeing and disgreeing with rationale	Listening to some lectures, talks, and presentations in the academic seminars and adapting some strategies to handle the Q&A sessions using polite and formal expressions to agree or disagree with the statements.	1
11	Modelling an interview: with a panel of fourjudges (peers)	Pre-task activity for orientation/ strategies (controlled/guided), Model interview (AV support), Group work (role play), interview in pair (one-to-one), Interview in group (many -to-one), oral corrective feedback (peer/ teacher)	2

12	Writing a short reflective report of an event - incident/ meeting/ celebration	Writing a report on meetings/ celebrations/ events etc. by actively involving in such events and giving a short oral presentation on the same.	4
13	Speaking on abstract and complex topics beyond his/her own area of interest/field of study, using the language flexibly and effectively.	Reading texts on abstract topics and comprehending the author's perspectives. Similarly, listening to talks and discussions on an abstract topic of other discipline and making short oral presentation by sharing views and opinions.	3
14	Self-relfection on own speech in context(recorded): tone, pitch, relevance, content; extending the reflections/ideas toothers	Listening to selected general discussions (audios and videos) and observing the language production. Recording own speech on some general topic and providing a critical review (self-reflection) on it by focusing on the tone, expressions and relevance of the content, etc.	1
15	Collaborative and individual task: planning, preparing (preparing an outline, structure, setting objectives and presenting the plan of action) and executing a mini-project, and submitting a brief report on the same peer and instructor feedback after the planning stage and on completion of the mini project	Pre-task modelling (peer/teacher), general discussion on structure, group work (collaboration), oral corrective, task distribution, presentation, feedback	5

Reference Books:

1. Latham-Koenig, C. & Oxenden, C. (2014). American English File-5. Oxford: OUPRichards,
2. J.C. and Bohlke, D. (2012). Four Corners-4. Cambridge: CUP.
3. Cambrdige Academic English: An Integrated Skills Course for EAP (Advanced) By MartinHewings and Craig Thaine, CUP (2012)
4. Berlin, A. (2016). 50 Conversation Classes: 50 Sets of Conversation Cards with an Accompanying Activity Sheet Containing Vocabulary, Idioms and Grammar. Poland: CreateSpace Independent Publishing Platform
5. Zemach, D. E., Islam, C. (2011). Writing Paragraphs: From Sentence to Paragraph. Germany: Macmillan Education.

6. Stewart, J. P., Fulop, D. (2019). Mastering the Art of Oral Presentations: Winning Orals, Speeches, and Stand-Up Presentations. United Kingdom: Wiley.
7. Kroehnert, Gary. (2010). Basic Presentation Skills. Sidney: McGraw Hill.
8. Cunninghum, S. & Moor, P. (nd). Cutting Edge (Advanced) With Phrase Builder. Longman Publishers. CUP
9. McCarthy, M & O'Dell, F. (2017). English Idioms in Use (Advanced). Cambridge: CUP.

Online Resources:

1. https://www.grammarly.com/blog/
2. https://www.nationalgeographic.org/education/
3. https://www.bbc.co.uk/teach/skillswise/english/zjg4scw
4. https://www.englishclub.com/
5. https://www.oxfordlearnersdictionaries.com/
6. https://dictionary.cambridge.org/
7. learnenglishteens.britishcouncil.org
8. https://freerice.com/categories/english-vocabulary
9. http://www.5minuteenglish.com/
10. https://breakingnewsenglish.com/
11. https://www.digitalbook.io/
12. https://librivox.org/

Course Outcomes:

1. Listen to extended lectures, presentations, and discussions on a wide range of contemporary issues and demonstrate understanding of relatively complex lines of argument. (Bloom's Taxonomy Level/s: 2)
2. Make presentations using suitable AV aids and engage in formal group discussions on a wide range of topics of contemporary interest, demonstrating awareness of standard/widelyaccepted conventions. (Bloom's Taxonomy Level/s: 3)
3. Read and demonstrate understanding of the writer's stance/viewpoint in articles and reports on a wide range of contemporary issues and discipline-specific subjects. (Bloom's Taxonomy Level/s: 2 & 4)
4. Write analytical essays on a wide range of general topics/subjects of interest, and engage in written communication (emails/concise reports) to exchange relatively complex information, giving reasons in support of or against a particular stance/point of view. (Bloom's Taxonomy Level/s: 3 & 4)
5. Complete a mini project that necessitates the use of fairly advanced communication skills to accomplish a variety of tasks and submit a report in the given format. (Bloom's Taxonomy Level/s: 4 & 5)

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	0	2	2	0	2	2	0				
CO2	3	3	0	3	0	0	3				
CO3	2	4	0	4	2	2	0				
CO4	3	4	0	4	0	0	3				
CO5	0	4	0	4	0	0	0				

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :30-04-2021 **ACADEMIC COUNCIL: 17-09-2021**

SDG No. & Statement:

SDG No. 4: Statement: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

SDG Justification:

The course aims to remove inequalities among admitted students with regard to basic communication skills in English and provide them communication as well as learning skills that are useful throughout their lives.

MFST1001	HEALTH & WELLBEING	L	T	P	S	J	C
		0	0	2	0	0	1*
Pre-requisite	**None**						
Co-requisite	**None**						
Preferable exposure	**None**						

Course Description:

The course provides the students a better understanding of the role of a proper diet in maintenance of human health. This course emphasizes the composition of the food, and will help to understand how to exercise, the role of sports and physical fitness in development of a good health. The course also focuses on the importance of emotional well-being and mindfulness. This course helps in teaching the role of yoga in maintenance of physical balance.

Course Educational Objectives:

- To provide an understanding of the relationship between food and nutrition
- To emphasize the role of exercise, sports and physical fitness in obtaining a good health
- To explain about the mindfulness and emotional well being
- To teach the role of yoga and meditation in maintaining the body balance

UNIT 1

Understand the relationship between Food and Nutrition and how food composition affects nutritional characteristics. Knowledge about regulatory principles in determining diets and recommended daily allowances. Understand how to create personalised diet/nutrition plans.

UNIT 2

Understand how exercise, activity and sports helps in developing good health. Experiential exposure to the role of proper, specific nutritional interventions along with structured activities on developing proper physical health. Practical exercises and assignments in sports and exercise regimes.

UNIT 3

Introduction to emotional wellbeing and mindfulness. Teaching of mindfulness practices to reduce stress, increase relaxation and improve mental wellbeing.

UNIT 4

Introduction to Yoga theory and how Yoga helps in maintaining balance in the body. Practice of Yoga and meditation to improve overall emotional and physical balance. Practical yoga exercises and meditation techniques

Course Outcomes:

By the end of the course, student will

1. Learn the role of nutrition and diet in maintaining a good health
2. understand how the exercise, sports and physical activities will improve health
3. learn mindfulness practices for reducing stress
4. know the importance of yoga and meditation

APPROVED IN:

BOS :30-04-2021 **ACADEMIC COUNCIL: 17-09-2021**

SDG No. & Statement:

SDG Justification:

PHPY1001	GANDHI FOR THE 21ST CENTURY	L	T	P	S	J	C
		2	0	0	0	0	2*
Pre-requisite	**None**						
Co-requisite	**None**						
Preferable exposure	**None**						

Course Description:

This course provides the students with basic knowledge on Gandhi's early life, transformations in South Africa and his entry into India's national movement. While going through the social-political, economic, and educational philosophies of Gandhi, the course analyses how his ideologies are relevant even in the 21st century.

Course Educational Objectives:

The objectives of the course are;

- To provide the students with the basic knowledge on Gandhi's life and his philosophies
- To understand the early influences and transformations in Gandhi
- To analyze the role of Gandhi in India's national movement
- To apply Gandhian Ethics while analyzing the contemporary social/political issues
- To appreciate the conflict resolution techniques put forward by Gandhi and its significance in the current scenario.

UNIT 1 MK Gandhi: Childhood and Education

M K Gandhi, Formative Years (1869-1893): Early childhood – study in England – Indian influences, early Western influences.

UNIT 2 From Mohan to Mahatma-South African Experiences

Gandhi in South Africa (1893-1914): South African Experiences – civil right movements in South Africa – invention of Satyagraha – Phoenix settlement- Tolstoy Farm – experiments in Sarvodaya, education, and sustainable livelihood.

UNIT 3 Gandhi and Indian National Movement

Gandhi and Indian National Movement (1915-1947): Introduction of Satyagraha in Indian soil -non- cooperation movement – call for women's participation – social boycott – Quit-India movement – fighting against un-touch ability – Partition of India- independence.

UNIT 4 Gandhi and Sustainable Development

Gandhian Constructive Programs-Eleven Vows-Sarvodaya-Seven Social Sins-Gandhian Economics and Sustainable Development

UNIT 5 Gandhi and Contemporary Issues

Conflict Resolution Techniques of Gandhi-Ecological Challenges and Gandhian solutions-Gandhian Ethics-An Analysis

References:

1. Gandhi, M K. (1941). *Constructive Programme*. Ahmadabad: Navjivan Publishing House
2. Gandhi, M. K. (1948). *The Story of My Experiments with Truth*. Ahmadabad: Navjivan Publishing House
3. Gandhi, M K. (1968). *Satyagraha in South Africa*. Ahmadabad: Navjivan Publishing House.
4. Khoshoo, T N (1995). *Mahatma Gandhi: An Apostle of Applied Human Ecology*. New Delhi:TERI
5. Kripalani, J.B. (1970). *Gandhi: His Life and Thought*. New Delhi: Publications Division.
6. Narayan, Rajdeva (2011). *Ecological Perceptions in Gandhism and Marxism*. Muzaffarpur: NISLS
7. Pandey, J. (1998). *Gandhi and 21st Century*. New Delhi: Concept.
8. Weber, Thomas (2007).Gandhi as Disciple and Mentor. New Delhi: CUP

Course Outcomes:

After the successful completion of the course the students will be able to;

1. Understand the life of Gandhi
2. Appreciate the role of Gandhian non-violence and Satyagraha in India's freedom struggle.
3. Critically examine the philosophy of Gandhi on Education, Sarvodaya, and Satyagraha
4. Analyse the contemporary significance of Gandhian constructive programmes and eleven vows
5. Examine the possible solutions for some of the contemporary challenges like environmental issues, moral degradation and ethical dilemmas.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3	3	3	3	3	3	3	2	2
CO2	3	3	2	3	2	3	3	3	3	2	3
CO3	3	3	3	2	3	2	2	3	3	2	2
CO4	3	2	2	3	3	2	2	3	3	2	3
CO5	3	3	2	2	3	3	3	3	3	3	2

Note: 1 – Low Correlation 2 – Medium Correlation 3 – High Correlation

APPROVED IN:

BOS :30-04-2021 **ACADEMIC COUNCIL: 17-09-2021**

SDG No. & Statement:

SDG Justification:

POLS1001	INDIAN CONSTITUTION AND HISTORY	L	T	P	S	J	C
		2	0	0	0	0	2*
Pre-requisite	**None**						
Co-requisite	**None**						
Preferable exposure	**None**						

Course Description:

This course analyses the basic structure and operative dimensions of the Indian Constitution. It explores various aspects of the Indian political and legal system from a historical perspective highlighting the various events that led to the making of the Indian Constitution. The course also deals with various challenges faced by the constitution and its coping mechanisms. Broadly, the students would understand and explain the working of different institutions and political debates ensuing from the operation of the Indian constitution in action.

Course Educational Objectives:

- To introduce constitutional history of India.
- To explain the process of making Indian constitution
- To analyze Fundamental of Rights, Duties and other principles in constitution
- To create familiarity with political developments which shaped the constitution.

UNIT 1 **India as a Nation** **6 hours**

Khilani, S. (2004). *Introduction, The Idea of India*, Chapter 1. New Delhi: Penguin Books,

pp. 1-15.

Rowat, D. (1950). 'India: The Making of a Nation', International Journal, 5(2), 95-108. Doi:10.2307/40194264

Brass, P. (2018). 'Continuities and Discontinuities between pre- and post-Independence India', Chapter 1.

The Politics of Idea since independence, New Delhi: Cambridge University Press. Pp. 1-30.

UNIT 2 **Understanding the Constitution** **6 hours**

Mehta, U.S. (2011). 'Constitutionalism' in *The Oxford Companion to Politics in India*, (ed) by Nirja Gopal Jayal, and Pratap Bhanu Mehta, New Delhi: Oxford University Press. Pp. 15-27.

Austin, G. (2016), 'The Constituent Assembly: Microcosm in Action' *in The Indian Constitution: Cornerstone of a Nation*, New Delhi: Oxford University Press, pp. 1-25.

Beteille, Andre (2008): "Constitutional Morality," *Economic and Political Weekly*, Vol 43, Issue No 40

Prahladan, Vivek (2012): "Emergence of the Indian Constitution," *Economic and Political Weekly*, Vol 47, Issue No 07.

UNIT 3 The Preamble, Fundamental Rights and Directive Principles of State Policy **6 hours**

Bhakshi, P.M. (2011). 'Preamble' in *The Constitution of India*, New Delhi: Universal Law. Pp. 1-5. Laxmikanth, M. (2017). 'Chapter IV: Preamble of the Constitution' in *Indian Polity*, Chennai: McGraw Hills.

Kumar, Virendra (2007): "Basic Structure of The Indian Constitution: Doctrine of Constitutionally Controlled Governance [From Kesavananda Bharati to I.R. Coelho]" *Journal of the Indian Law Institute*, Vol 49, No 3, pp 365-398.

Austin, G (2016), ' ' in *The Indian Constitution: Cornerstone of a Nation*, New Delhi: Oxford University Press, pp.63-105.

Reddy, S (1980). Fundamental Ness of Fundamental Rights and Directive Principles in the Indian Constitution. *Journal of the Indian Law Institute*, 22(3), pp. 399-407.

Bhatia, Gautam (2017): "The Supreme Court's Right to Privacy Judgement," *Economic and Political Weekly*, Vol 52, Issue No 44

UNIT 4 Citizenship **6 hours**

Jayal, N.G. (2019). 'Reconfiguring citizenship in contemporary India' in *South Asia Journal of South Asian Studies*, pp.33-58.

Roy, Anupama. (2010). 'Chapter I: Enframing the citizen in contemporary times' in *Mapping Citizenship in India*, New Delhi: Oxford University Press.

Das, Veena (2010): "State, Citizenship and the Urban Poor," *Citizenship Studies,* Vol 15, pp 319- 333.Valerian Rodrigue

UNIT 5 Separation and Distribution of Powers **6 hours**

Pal, Ruma. (2016). 'Separation of Powers' in *The Oxford Handbook of the Indian Constitution*, (ed) by Sujit Choudhry, Madhav Khosla, and Pratap Bhanu Mehta, Delhi: Oxford University Press.

Bakshi, P. (1956). 'Comparative Law: Separation of Powers in India'. *American Bar Association Journal, 42*(6), 553-595.

Rao, P. (2005). 'Separation of Powers in a Democracy: The Indian Experience'. *Peace Research, 37*(1), 113-122.

Kumar, Ashwani (2019): "Constitutional Rights, Judicial Review and Parliamentary Democracy,"

Economic and Political Weekly, Vol 51, Issue 15

Tillin, Louise. (2015). 'Introduction' in *Indian Federalism*. New Delhi: Oxford University Press. Pp. 1-30.

Chakrabarty, Bidyut and Rajendra Kumar Pandey. (2008). *Federalism' in Indian Government and Politics*, New Delhi: Sage Publications. Pp. 35-53.

Arora, B. and Kailash, K. K. (2018). 'Beyond Quasi Federalism: Change and Continuity in Indian Federalism', in *Studies in Indian Politics*, pp. 1-7.

Agrawal, Pankhuri (2020): "COVID-19 and dwindling Indian Federalism," *Economic and Political Weekly,* Vol 55, Issue No 26

Recommended Readings:

De, Rohit. (2018). *A People's Constitution – The Everyday Life of Law in the Indian Republic*, USA: Princeton University Press.

Granville Austin, *The Indian Constitution: Cornerstone of a Nation*, Oxford University Press, Oxford, 1966.

Lahoti, R.C. (2004). *Preamble: The Spirit and Backbone of the Constitution of India*. Delhi: Eastern Book Company.

Rajeev Bhargava (ed), *Ethics and Politics of the Indian Constitution*, Oxford University Press, New Delhi, 2008.

Subhash C. Kashyap, *Our Constitution*, National Book Trust, New Delhi, 2011. Tillin, Louise. (2015). *Indian Federalism*. New Delhi: Oxford University Press.

Zoya Hassan, E. Sridharan and R. Sudarshan (eds), *India's Living Constitution: Ideas, Practices, Controversies*, Permanent Black, New Delhi, 2002.

Course Outcomes:

On the successful completion of the course students would be able to:

1. Demonstrate an understanding of the Constitution of India and how constitutional governance is carried out in India
2. Interpret knowledge of the Fundamental Rights and Duties of the Citizens as well as the Obligation of the state towards its citizens
3. Correlate familiarity with key political developments that have shaped the Constitution and amended it from time to time.
4. Equip themselves to take up other courses in law after having done a foundation course on Indian Constitution

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	2	1	2	2	3	3	2	3	1	2
CO2	1	1	2	1	2	2	3	2	3	1	2
CO3	1	2	1	2	2	2	3	1	3	1	1
CO4	1	1	1	2	2	2	3	1	3	1	1
CO5	1	1	1	2	2	2	3	2	3	1	2

Note: 1 – Low Correlation 2 – Medium Correlation 3 – High Correlation

APPROVED IN:

BOS :30-04-2021 **ACADEMIC COUNCIL: 17-09-2021**

SDG No. & Statement:

SDG Justification:

VEDC1001	VENTURE DEVELOPMENT	L	T	P	S	J	C
		0	0	0	2	0	2
Pre-requisite	**None**						
Co-requisite	**None**						
Preferable exposure	**None**						

Course Description:

India as part of its "Make in India" initiative has been focusing on creating incubation centers within educational institutions, with an aim to generate successful start-ups. These start-ups will become employment creators than employment seekers, which is the need of the hour for our country. This common course (university core) for all the disciplines is a foundation on venture development. It is an experiential course that starts with students discovering their deeper self in terms of how they might contribute to society by creating exciting new products and services that can become the basis of real businesses. The students learn about the emerging areas of knowledge that are the foundations of any successful company. They will learn how to develop insight into the problems and desires of different types of target customers, and from this, to identify the design drivers for a specific innovation. Students will learn specific design methods for new products and services. The students will learn that as important as the product or service itself, is a strategy for monetizing the innovation – for generating revenue, structuring the operating costs, and creating the operating profit needed to support the business, hire new employees, and expand forward. This course is aimed to be the beginning of what might be the most important journey of personal and career discovery so far in a student's life, one with lasting impact. This is not just a course, but potentially, an important milestone in life that a student remembers warmly in the years to come.

Course Educational Objectives:

Students have the opportunity to:

- Discover who they are – Values, Skills, and Contribution to Society
- Understand how creativity works and permeates the innovation process
- Learn the basic processes and frameworks for successful innovation.
- Gain experience in going through the innovation process.
- Conduct field research to test or validate innovation concepts with target customers.

UNIT 1 PERSONAL DISCOVERY 4 hours

Personal Values, Excite & Excel, Build a Team, Define Purpose, Mission Statement

UNIT 2 **IDEATION** **10 hours**

Ideation & Impact, User Insights - Frameworks, Customer Interviews, Interpreting Results

UNIT 3 **SOLUTION DISCOVERY** **8 hours**

Concept Design, Competitive Analysis, Product Line Strategy, Prototyping Solutions, Reality Check

UNIT 4 **BUSINESS MODEL DISCOVERY** **4 hours**

Understand the Industry, Types of Business Model, Define Revenue Models, Define Operating Models, Define Customer Journey, Validate Business Model

UNIT 5 **DISCOVERY INTEGRATION** **4 hours**

Define Company Impact, Create Value, Tell Your Story

Textbooks:

1. Meyer and Lee, “Personal Discovery through Entrepreneurship”, The Institute for Enterprise Growth, LLC. Boston, MA., USA.

References:

1. Adi Ignatius (Editor-in-Chief), “Harvard Business Review”, Harvard Business Publishing, Brighton, Massachusetts,2021

Course Outcomes:

1. Identify one’s values, strengths and weaknesses and their will to contribute to the society
2. Formulate an idea and validate it with customers
3. Demonstrate prototyping and analyse the competition for the product
4. Create business models for revenue generation and sustainability of their business
5. Come up with a pitch that can used as the basis for actually starting a company based on an impactful innovation and societal impact

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1						3	1				
CO2		3		3	1	3	2				
CO3	1	3	3		3		3				
CO4					1	1	3				
CO5					3	3					

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS :30-04-2021 **ACADEMIC COUNCIL: 17-09-2021**

SDG No. & Statement:

4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

17. Strengthen the means of implementation and revitalize the global partnership for sustainable development.

SDG Justification:

4. The course involves identifying one's personal values and working on real-life problems, thus forming the base to work on their passions even past the collegiate life.

17. The course is developed in collaboration with North-eastern University, USA and the training for the champions is being by North-eastern University.

Faculty Core

IENT1001	BUSINESS ECONOMICS	L	T	P	S	J	C
		3	0	0	0	0	3
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

In today's competitive business environment, effective managerial/business decision making requires use of economic concepts and tools. Business efficiency depends on minimization of cost and maximization of production which requires perfect understanding of the economic concepts like demand, supply, production, cost and market conditions. Business economics uses economic concepts and principles by emphasizing on demand and Supply analysis, production & cost analysis and different market structures which are fundamental for further study. This course also introduces important macroeconomic concepts which are indispensable for understanding the functioning of an economy and which also affects the business performance

Course Educational Objectives:

- Understand the fundamental concepts of business economics
- Apply demand and supply situations, demand forecasting techniques that are helpful in decision making process for business organizations.
- Identify the optimum solutions in production process with the help of cost and output relationships
- Discover the market structures under different competitive conditions Correspond relevant information for business decisions by gaining knowledge about various macro-economic aspects.

UNIT 1 Introduction to Business Economics 9 hours

Introduction to Economics- Nature and Scope of Business Economics- Difference between Economics and Business Economics- Fundamental concepts associated with business economics-Role of Business Economics in decision making.

UNIT 2 Demand and Supply Analysis 9 hours

Demand and Supply Analysis: Determinants of demand, types of demand, Law of Demand, determinants of supply, law of supply, market equilibrium, price mechanism. Elasticity of demand, types of elasticity, methods to measure elasticity. Demand forecasting, Methods (Qualitative and Quantitative) of demand forecasting

UNIT 3 Production and Cost analysis 9 hours

Production and Cost Analysis: Production function, Laws of Production - Short run - one variable production function, Long run – Iso-quants, Iso-cost line, producer's equilibrium, expansion path, Law of returns to scale. Cost – Cost concepts, Cost output relation - short run cost output relationship, long run cost output relationship, Economies of scale and Dis Economies of Scale

UNIT 4 Market Structure 9 hours

Market Structure - Basis for classification of market power, kinds of competitive market, price and output decisions in perfect competition and imperfect market, Monopoly,

Monopolistic, Oligopoly market . Market Failures – public goods, social goods, merit goods, administered prices (ceiling price and floor price) and Externalities – Positive and negative externalities

UNIT 5 Macroeconomics 9 hours

Macroeconomics- National Income-Concepts of national income, methods of calculating national income. Inflation- causes-demand pull and cost push inflation, measures to control inflation, business cycles -phases of business cycles and measures to control business cycles. Stabilization policies – Monetary Policy and Fiscal Policy

Text Books:

1. Geetika, P.Ghosh, P.R.Choudhury, Managerial Economics, McGraw Hill Education PrivateLimited,New Delhi, 2018.
2. Dominick Salvatore, Seventh Edition, Adapted Version, Oxford Publication New Delhi, 2014

References:

1. Dr.D.N.Dwivedi, Managerial Economics, Vikas Publishing House, New Delhi,2015/Latest Edition.
2. Paul G. Keat, Phili K. Y. Young, Sreejata Banerjee, "Managerial Economics", Pearson, New Delhi, 2012/Latest Edition.

Course Outcomes:

1. Apply the essential concepts and principles of managerial economics in business decisions.
2. Demonstrate the knowledge of demand and supply conditions in the market.
3. Comprehend the skills to examine and estimate the production and cost behavior in short run and long run for analyzing the effect of economies and dis-economies of scale on the business.
4. Illustrate competition strategies, including costing, pricing, product differentiation, and market environment according to the natures of products and the structures of the Markets
5. Acquire the knowledge of macroeconomic variables and apply the data for forward planning and decision making in the dynamic environment

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	**2**	**2**	**1**	**1**	**1**	**1**	**3**	**3**	**2**	**3**	**3**
CO2	**1**	**3**	**3**	**0**	**0**	**1**	**2**	**3**	**3**	**2**	**2**
CO3	**1**	**3**	**2**	**1**	**0**	**2**	**1**	**2**	**2**	**3**	**2**
CO4	**2**	**2**	**3**	**1**	**1**	**3**	**1**	**2**	**2**	**2**	**1**
CO5	**0**	**0**	**3**	**1**	**2**	**2**	**3**	**3**	**2**	**1**	**1**

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS: 19th,May,2022 **ACADEMIC COUNCIL: 18-10-2021**

SDG No. & Statement: 11 & 12

SDG No & Statement – 11 & 12

Ensure sustainable consumption and production patterns. The use of services and related products, which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the need of future generations.

ACCN 1001	FINANCIAL ACCOUNTING AND ANALYSIS	L	T	P	S	J	C
		4	0	0	0	0	4
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

*Every manufacturing and trade business in an economy is intrinsically involved in financial transactions. These financial transactions serve as the foundation for the accounting system, which is just as critical as the technological or legal frameworks. Financial accounting knowledge enables managers to comprehend and evaluate financial reports, critical for making financial decisions and resolving problems. A manager should be capable of understanding the accounting structure to operate the organisation properly**The***

Course Educational Objectives:

- To know the basics of the accounting and preparation process of Journals and Ledgers.
- To understand the Prepare Trial Balance with adjustment.
- To know the accounting framework to prepare Final Accounts of trading concerns.
- To analyse and interpret the accounting information of financial statements for decision making.
- To prepare financial statements

UNIT 1 Introduction of Accounting 10 hours

Introduction, need, and definition of Accounting. Importance of Accounting, users of Financial Accounting records, Accounting concepts and conventions – Accounting Equation – Basics of IFRS**.**.

UNIT 2 Journal and Ledgers 12 hours

Preparation of Journal and Ledgers – Types of Subsidiary books – Preparation of Triple Column Cash Book. Trial balance: Definition – Importance and methods of preparation. (NP)

UNIT 3 Preparation of Financial Statements 12 hours

Objective and need for preparation of Income Statements – Form and contents of income statements. Preparation of Trading Account, Profit and Loss Account with adjustments. Preparation of Balance Sheet – Objectives and need for balance sheet – Form and contents of balance sheet. Preparation of balance sheet with Adjusting Closing Entries relating to Depreciation on Fixed Assets (Straight Line Method and Written down Value Method), outstanding expenses, prepaid expenses, Income received in advance, Accrued income, debtors, creditors and closing stock. (NP)

UNIT 4 Financial Statement Analysis 12 hours

Financial Statement Analysis: Funds flow analysis – Statement of funds from operations – Preparation of Funds flow statement. Cash flow analysis: Statement of cash from operations – Preparation of Cash Flow Statements (NP)

UNIT 5 Ratio Analysis 6 hours

Meaning and types of ratios: Return on Capital Employed; Gross and Net Profit Margins; Asset Turnover; Trade Receivables Collection Period and Trade Payables Payment Period; Current and Quick Ratios; Inventory Turnover; Capital Gearing Ratio. (NP)

Textbooks:

1. S.N. Maheshwari, S.K. Maheshwari and CA S.K. Maheshwari (2016). Accounting for Management. Vikas Publishing House, 3rd Ed. Noida.
2. S.P. Jain & Narang, "Financial Accounting - I, Kalyani Publishers, 2010.

References:

1. 1. Ambrish Gupta (2016). Financial Accounting for Management: An Analytical Perspective. Pearson Education, 5th Ed. New Delhi.
2. Paul M. Collier (2015). Accounting for Managers: Interpreting Accounting Information for Decision Making. Wiley Publishers, UK.

Course Outcomes:

After successful completion of the course the student will be able to:

1. Differentiate the book-keeping and double entry system
2. Prepare trial balance from the ledger balances
3. Prepare balance sheets
4. Analyse cash flow statement and know its uses
5. Analyse and interpret the financial statements with ratio analysis

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	**1**	**0**	**0**	**0**	**0**	0	0	1	0		
CO2	**1**	**2**	**0**	**1**	**0**	0	0	1	1		
CO3	**2**	**2**	**3**	**2**	**1**	0	0	2	1		
CO4	3	2	2	1	1	0	0	2	1		
CO5	3	2	2	1	1	0	0	2	1		

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS:28-04-2021 **ACADEMIC COUNCIL: 18-10-2021**

SDG No. & Statement: GOAL 4: Quality Education

GOAL 16: Peace and Justice Strong Institutions

SDG Justification:

Quality Education: Students will be learning about the recent updates of Accounting & Finance with special reference to Performance Management Concepts Strategic Level papers.

Peace and Justice Strong Institutions: Students are enabled to learn about the growth and performance of a company based on all perspectives, both quantitative and qualitative factors. This leads to build strong institutions.

IENT1011	Indian Business Environment	L	T	P	S	J	C
		3	0	0	0	0	3
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

The business environment in India is undergoing a dynamic change; what was lookeduponasanunderdevelopednationisnowregardedasapotentialeconomic power and emerged as one of the emerging nation of the world. With the eruption digitization and e-commerce its service industry is providing multinational companies with unparalleled opportunities. With liberalization, privatization and further on globalization India's business world is occupying a place in almost all major sectors of the world economy. In this context, the nature and extent of the role of the state is undergoing fundamental changes with digitization and financial inclusion. In this dynamic and changing external environment of such gigantic dimensions, this course is aimed at sensitizing the students to the value implications of environment on business, in general. The main drive of this course addresses structural changes, external environmental changes, planning and polices of the state ,economic trends, information technology and its impact .Knowing the major legal environment concepts and acts in addition to other environments is also to be discussed in this course. Though business is an economic activity, business ethics, social responsibilities of business and corporate governance is introduced in this course.

Course Educational Objectives:

- To describe micro and macro factors affecting business and its impact on business decisions.
- To analyze Indian economic planning and its impact on business environment.
- To discuss the monetary and fiscal policies in India and their impact on business.
- To examine the relationship between society and business.
- To analyze the regulatory and actions of corporate governance.

UNIT 1 **9 hours**

Business Environment: Nature, scope and objectives of business-Environment of business description-internal environment and external environment- Political environment- Economic environment- Social Environment- Technological environment- Ecological & Legal environment-Macro environment and Microenvironment.

UNIT 2 **9 hours**

Economic Planning and Industrial Policy: Economic Planning impact on business environment-Meaning and Objectives of Industrial Policies -Need for Industrial Policies- Salient features of 1948, 1956, 1991 Industrial Policies- Closed economy and open economy- Liberalization, Privatization and Globalization-NITI AAYOG and its objectives- Ease of doing business- FERA-

FEMA- Competition Act.

UNIT 3 **9 hours**

Monetary and Fiscal Policy: Monetary Policy and its objectives - CRR and SLR-Money Supply-instruments of money supply- RBI's Monetary Policy Measures- Fiscal Policy and its objectives-Techniques of Fiscal Policy- Impact of Monitory and Fiscal Policy on business environment- Central and States Budget- finances of the central and state budgets.

UNIT 4 **9 hours**

Business and Social Environment: Business and Society- objectives and importance of business-Professionalization of Business- Ethics in business-Impact of cultural factors in business- Social Responsibility of Business-giving back to the society-Social involvement, social audit-Companies Act 2013 and CSR.

UNIT 5 **9 hours**

Corporate Governance: Description of Corporate Governance-reasons for the growing demand for corporate governance-importance of corporate governance- prerequisites; regulatory and voluntary actions; recommendations of Birla Committee; legal environment of corporate governance in India

Text Books:

1. Justin Paul, Business Environment Text and Cases, 4th edition, Tata McGrawHill, New Delhi, 2019.

2. Francis Cherunilam, Business Environment, Text & Cases, 27th Revised Edition, Himalaya Publishing House, New Delhi, 2019.

References:

1. Aswathappa K, Essentials of Business Environment, 12th Revised Edition, Himalaya Publishing House, New Delhi, 2014.

2. Shaikh Saleem, Business and Environment, 3rd Edition, Pearson Education, New Delhi, 2017.

Course Outcomes:

1. Distinguish between micro and macro environmental factors.
2. Analyze the Globalization impact on Indian Business Environment.
3. Outline the objectives of Monetary and fiscal policies in India.
4. Assess how the social audit under companies Act relates to CSR.
5. Discuss and analyze the need of corporate governance in India.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	1	3	2	3	3	3	3	3	3	3
CO2	3	1	2	1	1	1	3	3	3	2	3
CO3	3	1	2	1	1	1	3	3	3	1	3
CO4	3	3	3	3	3	3	2	3	3	3	3
CO5	3	1	3	3	3	3	2	3	3	3	3

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS:28-04-2021 **ACADEMIC COUNCIL: 18-10-2021**

SDG No. & Statement: 11 & 12

SDG No & Statement – 11 & 12

Ensure sustainable consumption and production patterns. The use of services and related products, which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the need of future generations.

HRMG1001	PRINCIPLES AND PRACTICE OF MANAGEMENT	L	T	P	S	J	C
		0	0	0	0	0	0
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

One of the most important human activities is managing. Management can be traced back to ancient times whenever there was large-scale endeavor like great pyramids in Egypt, the Great Wall of China, Taj Mahal in India. All these required many people working in groups in a better-coordinated way to achieve a well-defined target over some time. In the present context, of globalization, because of the increasing role of large and complex organizations in the development of the economy, the concept of Management has become very significant for managing the business efficiently.

Course Educational Objectives:

- To understand theoretical aspects, processes and principles, the scope of Management and its application to modern management practice.
- To analyze how the field of Management has evolved and its significant contributions
- To learn various organizational structures and types for the optimum utilization of the available resources.
- To apply leadership theories and demonstrate leadership styles to getting things done through people.
- To validate various controlling techniques to enhance managerial practices to accomplish the predetermined goals of the organization.

UNIT 1 Management Nature and Concept 10 hours

Nature, Concept, Scope and Significance; Functions; Management: Art or Science or Profession; Organization vs Administration vs Management, Schools of Management: Contributions of F.W. Taylor, Henry Fayol, Elton Mayo; Roles of Managers; Social Responsibility and Business Ethics.

UNIT 2 Planning 9 hours

Concept, Objectives, Types, Steps and Techniques; Making Planning Effective; Decision Making: Steps in Decision Making and Types; Management by Objectives (MBO).

UNIT 3 Organizing 10 hours

Structure, Nature, Types of Organizations, Principles of Organizing; Departmentalization; Delegation; Decentralization of Authority; Span of Control - Line and Staff Functions; Staffing: Concept, Significance and Functions.

UNIT 4 Leading 9 hours

Introduction, Characteristics of a Leader, Functions of a Leader; Leadership and Management; Principles of Leadership, Styles of Leaders.

UNIT 5 Controlling 9 hours

Introduction, Concept of Controlling, Purpose of Controlling; Types of Control; Steps in Controlling; Techniques in Controlling.

Textbooks:

Harold Koontz & Heinz Weirich (2012), Management, a Global and Entrepreneurial Perspective, New Delhi: Tata McGraw Hill Publishing company.

References:

1. Dipak Kumar Bhattacharyya (2012), Principles of Management: Text and Cases, New Delhi: Pearson Publications.
2. Balasubramanian. N. (2012), Management Perspectives, New Delhi: MacMillan India Ltd.
3. Charles Hill, Steven Mc Shane (2012), Principles of Management, New Delhi: Tata Mac Graw Hill
4. Ricky W. Griffin (2012), Management, New Delhi: Cengage Learning.
5. Terry and Franklin (2011), Principles of Management. New Delhi: AITBS Publishers.
6. Robert Kreitner (2012), Principles of Management. New Delhi: Cengage, South-Western12 E

Course Outcomes:

After successful completion of the course the student will be able to:

1. can apply different managerial roles in Business organization
2. explain the importance of MBO in organization
3. aware the concept and principles of Organizing
4. analyze and apply different leadership styles
5. understand the concept and purpose of Controlling in Organizations

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	0	2	0	1	1	1	0	3	1	1	0
CO2	0	1	2	0	1	0	1	2	2	0	0
CO3	2	1	2	0	1	0	1	2	2	2	1
CO4	1	2	1	1	2	1	1	2	2	3	2
CO5	2	1	1	1	1	0	0	2	1	2	2

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS:28-04-2021 **ACADEMIC COUNCIL: 18-10-2021**

SDG No. & Statement:

SDG Justification:

Statement: The modules and topics mentioned in this course are designed to ensure quality management education which helps lifelong learning in understanding and managing the challenges of changes in the dynamic business environment.

HRMG1021	HUMAN RESOURCE MANAGEMENT	L	T	P	S	J	C
		3	3	0	0	0	3
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Success in today's competitive business environment is increasingly a function of effective management of its resources, particularly human resources, which are the most valuable assets of an organization. The efficiency and quality of service of an organization depend on its employee's enthusiasm and satisfaction with their jobs, which are directly related to their sense of being treated fairly. To become a successful manager, it is imperative to understand human sensitivities and factors that motivate individuals. Human Resource Management course provides the basic tools required as an HR professional in an organization

Course Educational Objectives:

- To Understand the fundamentals, evolution, function & challenges of HRM
- To Explore the role of HRM in procurement, development of human resources
- To Analyze the basic factors in designing the compensation and collective bargaining
- To Evaluate safety and health and establish effective separation practices.

UNIT 1 Introduction 7 Hours

Nature, scope, and significance of HRM - Evolution of HRM – Recent trends in HRM – Functions of HRM – Challenges of HR managers.

UNIT 2 Procurement 10 Hours

Human Resource Planning – HR Forecasting methods - Job analysis and Job design – Recruitment - Selection – Induction.

UNIT 3 Development 9 Hours

Identification of training needs - designing the training program – Methods of training – Difference between Training & Development.

UNIT 4 Compensation and Integration 10 Hours

Introduction - Basic factors in determining pay rates – Basic, Supplementary and Executive Remuneration – types of employee benefits and services - Quality of work-life – Collective Bargaining.

UNIT 5 Separation and Maintaining 9 Hours

Communication and Counseling - Safety and Health – Internal mobility - Retirement and Retirement benefits.

Textbooks:

1. Gary Dessler & Biju Varkkey, "Human Resource Management," Pearson, New Delhi, 16th edition.
2. George W Bohlander, Scott A Snell, "Principles of Human Resource Management," Cengage Learning, 2017.16th edition

References:

1. Aswathappa, K., Human Resource and Personnel Management: Text & Cases, TMGH

2. Subba Rao, P., Personnel and Human Resource Management (Text & Cases), Himalaya

Course Outcomes:

After successful completion of the course the student will be able to:

1. Understand the fundamentals, evolution & challenges of HRM, various HRM initiatives
2. Explore the role of HRM in procurement of human resources
3. Evaluate the training and performance appraisal methods
4. Apply these to help in building loyal and committed employees to achieve organizational success in a competitive environment

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	2	1	0	2	3	1	0	0
CO2	1	2	1	3	1	1	1	2	1	1	0
CO3	2	1	2	2	1	0	1	0	1	1	0
CO4	2	1	2	1	1	1	3	2	0	1	0
CO5											

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:	
BOS:28-04-2021	**ACADEMIC COUNCIL: 18-10-2021**
SDG No. & Statement:	**8 Decent Work and Economic Growth**
SDG Justification:	**Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all**

MKTG1001	MARKETING MANAGEMENT	L	T	P	S	J	C
		3	0	0	0	0	3
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Marketing as a subject primarily caters to the consumerist instincts of an individual. The markets are driven by consumer behaviour, which has evolved and is much more demanding these days. Consumer satisfaction takes precedence for a business to be successful. This calls for managers to adopt creative and unique marketing strategies to gain a competitive advantage. Marketing Management equips managers with the required theoretical knowledge and practical skills to gain insights into the dynamic nature of the markets and then devise ways and means to manage them effectively.

Course Educational Objectives:

- To explain the conceptual framework of marketing and its applications in "the real world."
- To apply concepts of marketing to address problems and opportunities in the new marketing environment
- To illustrate the functionality and application of elements of Marketing Mix
- To create a suitable marketing plan for a product
- To assess the range of common strategies used with each of the various promotional mix tools.

UNIT 1 **9 Hours**

Definition, Nature, Scope, and Importance of Marketing – Core Concepts -Need, Want, Desire, Demand, Value, Exchange; philosophies of Marketing- Product – Production - Sales – Marketing – Societal – Relational marketing Concept of Marketing Myopia. Product Vs. service – Recent Trends in Marketing: Social Media Marketing and Digital Marketing.

UNIT 2 **9 Hours**

Factors influencing buyer behavior –five-step buyers decision process - Segmenting, Targeting and Positioning - Concept of Market Segmentation, Bases for Segmenting Consumer Markets, Targeting (T), Positioning (P) Value Proposition and USP

UNIT 3 **9 Hours**

Elements of the marketing Mix – four P's, extended three Ps of services. Product Decisions: Product Concept -Classification of Products – Product Life Cycle Stages, New Product Development

UNIT 4 **9 Hours**

Pricing and Channels of Distribution: Pricing Objectives – Factors Influencing the Pricing Policy – Pricing Methods, Channels of Distribution: Definition – Nature – Types-Functions and levels of distribution channels

UNIT 5 **9 Hours**

Importance of Promotion – Managing Advertising – Sales Promotion –Personal Selling and Direct Marketing– Publicity and Public Relations. Integrated Marketing Communication (IMC), Social Marketing

Textbooks:

1. Philip Kotler, Gary Armstrong, and Prafulla Agnihotri, Principles of Marketing, Pearson India, 17th Edition. New Delhi: 2018.
2. Rajan Saxena, Marketing Management, Tata-McGraw Hill, Fifth Edition New Delhi:2015

References:

1. Ramaswamy and Namakumari -Marketing Management- Indian Context -Global Perspective, Sage Publications India Pvt Ltd; Sixth Edition 2018
2. C. B. Gupta and Dr. N. Rajan Nair, Marketing Management: Text and Cases 15th Edition, S. Chand, and Sons 2012
3. N Rajan Nair and Sanjith R Nair, Marketing – Revised Edition, Sultan Chand & Sons – Tb, 2017

Course Outcomes:

After successful completion of the course the student will be able to:

1. Discuss the core concepts of marketing
2. Explain the factors influencing buyer behaviour
3. Understand the concept of the marketing mix and service Mix
4. Explain the pricing methods in a business setting
5. Understand the purpose of promotion for the business

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	**2**	**3**	**2**	0	**3**			**3**	**3**	**3**	
CO2	**0**	**3**	**3**	3	**0**			**0**	**0**	**0**	
CO3	**3**	**3**	**3**	2	**2**			**3**	**3**	**3**	
CO4	**3**	**3**	**2**	2	**2**			**3**	**3**	**3**	
CO5	**3**	**3**	**2**	2	**2**			**3**	**3**	**3**	

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS:28-04-2021 **ACADEMIC COUNCIL: 18-10-2021**

SDG No. & Statement: 8

Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

SDG Justification:

IENT2001	ENTREPRENEURSHIP	L	T	P	S	J	C
		0	2	0	0	0	2
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Entrepreneurship is an essential element for economic progress as it manifests its fundamental importance in different ways: a) by identifying, assessing, and exploiting business opportunities; b) by creating new firms and/or renewing existing ones by making them more dynamic; and c) by driving the economy forward – through innovation, competence, job creation- and by generally improving the well-being of society.

Course Educational Objectives:

1. Describe the characteristics of an entrepreneur and the types of entrepreneurs.
2. Understand the entrepreneurial Process and Government Support to Entrepreneurs.
3. Discuss the sources of business ideas and evaluate the business opportunity.
4. Explain the formation of a business and different sourcing of funds**.**
5. To know business plan preparation and business model development.

UNIT 1 Entrepreneur and Entrepreneurship 8 Hours

Description of Entrepreneur and Entrepreneurship, Evolution of Entrepreneurship, Characteristics of Entrepreneur, Functions of an Entrepreneur, Types of Entrepreneurs, Growth of Entrepreneurship in other countries and in India, Barriers of Entrepreneurship, and Role of Entrepreneurship in economic development.

UNIT 2 Nature and Nurture of Entrepreneurs 8 Hours

Entrepreneurial Motives, Motivating factors of Entrepreneurship, Theories of Entrepreneurship, Entrepreneurial culture, Entrepreneurial Knowledge and Skills, Entrepreneurial Competencies, Entrepreneurial Process, Entrepreneurship Development Programs and Government Support to Entrepreneurs.

UNIT 3 Business Incubation and Start-up 8 Hours

Invention, Innovation and Imitation, Sources of Business Ideas, Opportunity Recognition, Brain Storming, Idea Possibility, Scanning the Environment, Gaps for new business and new ways of business, Evaluating Business Opportunity, Feasibility Study, Start-up/Entrepreneurial Ecosystem, Understanding the Market and the Customer Needs, Framing Unique Selling Proposition (USP), Risk and Return Assessment and Prototype Development.

UNIT 4 Formation of Business and Sourcing of Funds 8 Hours

Trademark/Patent/Business Name Registration Process-Sole Proprietorship, Partnership, Limited Liability Partnership (LLP), Private Limited Company and Public Limited Company Registration process, Sourcing of Funds- Cost of the project, Own Funds, Seed Capital, Angel Investment, Crowd Funding, Venture Capital, Private Placement, Term Loans, and Capital Market Funds (Equity and Debt Funds).

UNIT 5 Business Plan and Business Model 8 Hours

Conceptual framework of Business Plan- need and importance, Process of Business Plan and Minimum Viable Product (MVP): Business Model Development - Value Proposition, Generic and Specific Business Models, Business Model Innovation, Competitive Advantage and Sustenance of the Business.

Textbooks:

1. Donald F. Kuratko (2014), Entrepreneurship: Theory, Process, Practice New Delhi: Cengage Learning.
2. Robert D. Hishrich, Mathew J Manimala, Entrepreneurship, Mc Grah Hill Education, New Delhi.

References:

1. Arya Kumar, Entrepreneurship: Creating and Leading an entrepreneurial organization, Pearson Publications, New Delhi
2. Raj Shankar (2012), *Entrepreneurship Theory and Practice*, New Delhi: Tata Mc Graw Hill.
3. S.Anil Kumar &S.C Purnima, *Entrepreneurship Development*, New Delhi: New Age Publishers.
4. A Shay and V Sharma, Entrepreneurship and New Venture Creation, New Delhi: Excel Books.
5. Vasant Desai, *Dynamics of Entrepreneurial Development and Management*, New Delhi: Himalaya Publishing House.
6. Madhurima Lall and ShikhaSahai, *Entrepreneurship*, New Delhi: Excel Books
7. Bruce R. Barringer and R. Duane Ireland, Entrepreneurship: Successfully Launching New Ventures, 3rd Edition, Pearson Prentice Hall (2009).
8. Poornima M. Charantimath (2012), *Entrepreneurship Development – Small Business Enterprises*, New Delhi, Pearson

Course Outcomes:

After successful completion of the course the student will be able to:

1. Understand the skills/talents required to become a successful entrepreneur.
2. Able to identify real-time problems and find solutions to create and design new with acceptable solutions.
3. Able to identify the sources of new business ideas and business opportunities.
4. Know the different sources of funds to start a new business.
5. Understand the steps to be taken to prepare a business plan and develop a suitable business model.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	2	3	1	2	1	1	2	3
CO2	1	1	1	2	3	1	2	2	2	2	1
CO3	2	1	1	2	3	3	2	2	3	2	2
CO4	1	2	3	3	3	2	3	1	1	1	2
CO5	1	2	3	3	2	3	1	3	2	2	2

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS:28-04-2021 **ACADEMIC COUNCIL: 18-10-2021**

SDG No. & Statement: 8

Decent Work and Economic Growth

SDG Justification:

The course aims to articulate learners with a mindset to align themselves towards inclusive and sustainable economic growth, productive employment generation and decent work for all.

FINA 2001	ESSENTIALS OF FINANCIAL MANAGEMENT	L	T	P	S	J	C
		3	0	0	0	0	3
Pre-requisite	Financial accounting and analysis, cost and management accounting						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Finance is the life blood of the business. Financial Management is one of the key areas of management. This Course helps in understanding of the fundamentals of financial management in terms of investment; financing and dividend policy. This course is designed to familiarize the students with the basic concepts and practices of Financial Management.

Course Educational Objectives:

- To familiarize the students with the basic concepts of Financial Management.
- To give thorough understanding of the practices of basic Financial Management

UNIT 1 Financial Management - An Introduction 10 Hours

Meaning and Definition of financial Management, Goals of Financial Management, Finance Functions, Organisation of finance function, Interface between Finance and other business functions, Financial Planning, Steps in Financial Planning, Factors Affecting Financial Plans, Time Value of Money.

UNIT 2 Investment Decisions 10 Hours

Introduction to Capital Budgeting, Importance of capital Budgeting, Capital Budgeting Process, Techniques of Capital Budgeting - Accounting Rate of Return, Pay Back Period, Net Present Value, Internal Rate of Return and Profitability Index.

UNIT 3 Financing Decisions 18 Hours

Cost of Capital - Cost of Debt, Cost of Preference Shares, Cost of Equity Shares, Cost of Retained Earnings, Weighted Average Cost of Capital; Leverages – Introduction – Types of Leverages – Measurement of Operating Leverage, Financial Leverage and Combined Leverage ; Capital Structure – Introduction, Features of Ideal Capital Structure, Factors affecting Capital Structure, Theories of Capital Structure - Net Income Approach, Net Operating Income Approach, Modigliani and Miller Approach and Traditional Approach

UNIT 4 Working Capital Management 12 Hours

Introduction – Concepts of Working Capital, Objective of Working Capital Management, Need for Working Capital, Operating Cycle, Determinants of Working Capital, Estimation of Working Capital.

UNIT 5 **Dividend Decisions** **8 Hours**

Introduction, Forms of Dividends, Types of Dividend Policies, determinants of Dividend Policy -Theories of Dividend Policy - Walter Model, Gordon Model, Modigliani and Miller Model – Bonus Shares and Stock Split – Legal, procedural and Tax Aspects of Dividend Policy.

Textbooks:

1.R.K. Sharma &Shashi K. Gupta(2014),Financial Management.Ludhiana:Kalyani Publications.

References:

1. I.M. Pandey (2010),Financial Management,NewDelhi:Vikas Publications.
2. M.Y. Khan & P.K. Jain. (2013), Financial Management.New Delhi: Tata McGraw Hill

Course Outcomes:

After successful completion of the course the student will be able to:

1. Students can make optimum decisions pertaining to raising funds, making investments and managing the assets of a corporation, big or small.
2. Students learn to manage finances with the ultimate goal of creating value.
3. Students can perform working capital management.
4. Students can execute dividend decisions and can design a dividend policy.
5. Students can take financial decisions and design financial strategies.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	**1**	**0**	**0**	**0**	**0**	0	0	1	0		
CO2	**1**	**2**	**0**	**1**	**0**	0	0	1	1		
CO3	**2**	**2**	**3**	**2**	**1**	0	0	2	1		
CO4	3	2	2	1	1	0	0	2	1		
CO5	3	2	2	1	1	0	0	2	1		

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS:28-04-2021 **ACADEMIC COUNCIL: 18-10-2021**

SDG No. & Statement: GOAL 4: Quality Education

SDG Justification:

Quality Education: Students will be learning about the recent updates of Accounting & Finance with special reference to Performance Management Concepts Strategic Level papers.

LANG1081	SPECIAL ENGLISH	L	T	P	S	J	C
		3	0	0	0	0	3
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

COURSE OBJECTIVES

- Understand and appreciate different literary genres.
- Recognize and analyse the main elements of different literary genres particularly short stories, essays, and poetry.
- Demonstrate in written and oral form both the comprehension and the analysis of literary texts (poetry,prose,short stories and essays)
- Appreciate and apply stylistic differences while communicating in a contemporary context for different purposes
- Create reasonably professional scripts with correct and varied usage of grammatical structures and punctuation for accurate communication of ideas

UNIT -I

Poetry

1. The Road Not Taken by Robert Frost
2. The Walrus and the Carpenter by Lewis Carroll
3. Captain! My Captain! by Walt Whitman
4. Sonnet 'No-60'-William Shakespeare
5. "The Sun Rising" by John Donne

UNIT-II

Short Stories

1. My Financial Career -Stephen Leacock
2. A Story from Confucius- Confucius
3. The Barber's Trade Union-Mulk Raj Anand
4. An Occurrence at Owl Creek Bridge by Ambrose Bierce
5. The Story of an Hour by Kate Chopin

UNIT-III

Essays

1. "A Hanging" – George Orwell
2. "Self-Reliance"-Ralph Waldo Emerson
3. "Attitude"- Margaret Atwood
4. "The Responsibility of Intellectuals"- Noam Chomsky
5. "Letter To His 10-Year-Old Daughter- Richard Dawkins

UNIT-IV:

Contemporary Issues

1. "The Globalization of Inequality"- P. Sainath
2. "Words from an Open Mind to a Closed or Sealed One"- Ramachandra Guha
3. "The idea of India" - Aruna Roy
4. "Why not a separate UN Charter on Casteism?"- K. Balagopal
5. "The root cause of corruption" -Tabish Khair

UNIT-V:

Coursera Courses:

- Advanced Grammar & Punctuation Project (UCI Division of Continuing Education) 20 hours
- Advanced Writing (UCI Division of Continuing Education) 26 hours

COURSE OUTCOMES

Upon successful completion of the course, the student will be able to:

1. Recognize and incorporate proper grammar and other mechanics of language in one's communication acts.(L1, L3)
2. Demonstrate an understanding of the distinct literary characteristics of poetry, short story and essay as literary genres (L2)
3. Analyze and effectively communicate ideas related to the prescribed literary genres for their structure and meaning, using correct terminology. (L3,L4)
4. Write paragraphs, essays and reviews with the complexity considered appropriate for the undergraduate level (L3,L5)
5. Analyze, describe, and debate the complexities of globalization, situating own reading in terms of society, religion, caste, region, gender, and politics (L3, L4)

LANG1091	HINDI	L	T	P	S	J	C
		3	0	0	0	0	3
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description: This course contains a rich selection from Hindi poetry and prose. Grammar and translations from official language are also included.

COURSEOBJECTIVES

1) To enlighten students about the richness and value of the national language
2) To offer working knowledge of Hindi to the students.

SYLLABUS

गद्यविभाग (Prose Detailed Text)

1.बाजारदर्शन' - श्रीजैनेंद्रकुमार
2. ईर्ष्या, तूनगईमेरेमनसे - रामधारीसिंह 'दिनकर
3.आपनेमेरीरचनापढ़ी? - हज़ारीप्रसादद्विवेदी
4. भारतीयसाहित्यकीएकता - नन्ददुलारेवाजपेयी
5.अतिथि - रामविलासशर्मा
6. मेरीरुमालखोगई -विद्यानिवासमिश्र
7. कविऔरकविता - आचार्यमहावीरप्रसादद्विवेदी
8. सोनाहिरनी - महादेवीवर्मा
9. *कफ़न* - मुंशीप्रेमचन्द

उपवाचकविभाग(Non Detailed Text)

1.पुरस्कार - जयशंकरप्रसाद
2. हार - मन्नूभंडारी
3. सदाचारकातावीज - हरिशंकरपरसाई
4. आदमीकाबच्चा - यशपाल
5. हारकीजीत - सुदर्शन
6. ठाकुरकाकुआं - मुंशीप्रेमचन्द
7. उसनेकहाथा - चंद्रधरशर्मागुलेरी
8. रोज - अज्ञेय
9. चीफकीदावत - भीष्म साहनी

व्याकरणविभाग

I. निर्देशकेअनुसारवाक्योंकोबदलकरलिखिए
(Rewriting of sentences as directed)

1. कारक (case)
2. लिंग (gender)
3. वचन (number)
4. वाच्य (voice)

II. शुद्धकीजिए (correction of sentences)

1. चाहिएप्रयोग
2. लिंगऔरवचनसंबंधी

III. वाक्यप्रयोग (make your own sentences)

IV. कार्यालयहिंदी: प्रशासनिक
शब्दबली / परनाम (karyalay Hindi : Administrative terminology)
1. कार्यालयो केनाम
2. पदनाम

V. संधिविच्छेद

VI. विलोमशब्द

VII. पत्रलेखन

VII. गंधाशकेआधारपरदिएगयेप्रशनोकाउत्तरदेनाचाहिए

VII. निबंध

COURSE OUTCOMES

1) The student learns reading and writing Hindi
2) Understands and learns proper use of Grammar
3) Develops communication Skills.

TEXTBOOK

1. ProseText:Dr.AjayaKumarPatnaik,**GadyaGaurav**,SonamPrakashan,Badamdadi,Cuttak.

2. Non,DetailedText:Dr.GulamMoinuddinKhan,**CharchitKahaniyan**,ShabnamPustak Mahal, Badamdadi, Cuttak.Text: Dr.T.Nirmala& Dr. S. Mohan, PadyaManjari, RajkamalPrakashan, New Delhi.* Latest Editions

LANG1101	SANSKRIT	L	T	P	S	J	C
		3	0	0	0	0	3
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course contains a rich selection from Sanskrit language and literature.

COURSE OBJECTIVES

1. To enlighten students about the richness and value of the classical language
2. To offer working knowledge of Sanskrit to the students.

SYLLABUS

POETRY: Lesson No. 1 Saranagathi
From Valmiki Ramayanam
Yuddhakanda 17th Canto
Slokas 11 – 68

Lesson No. 2 Ahimsa Paramodharmah
From Srimadbharatam,
Adiparva 8th chapter Sloka 10
– to the end of 11 Chapter

Lesson No. 3 Raghoh Audaryam
From Raghuvamsa 5th Canto 1 – 35 Slokas

PROSE : Lesson No. 4 Mitrasampraptih
From Pancatantra – Ist Story (Abridged)

Lesson No. 5 Modern prose Chikroda katha
Andhra Kavya Kathah
By Sannidhanam Suryanarayana Sastry

Lesson No. 6 Computer Yanthram
By Prof. K.V. Ramakrishnamacharyulu

GRAMMAR

DECLENSIONS:

Nouns ending in Vowels:

Deva, Kavi, Bhanu Dhatr, Pitr, Go, Rama, Mati, Nadee,
Tanu, Vadhoo, Matr, Phala, Vari & Madhu

SANDHI:
Swara Sandhi : Savarnadeergha, Ayavayava, Guna, Vrddhi, Yanadesa

Vyanjana Sandhi : Scutva, Stutva, Anunasikadvitva, Anunasika, Latva, Jastva

Visarga Sandhi: Visarga Utva Sandhi, Visargalopa Sandhi, Visarga Repha Sandhi, Ooshma Sandhi

SAMASA :

1. Dwandwa
2. Tatpurusha (Common)
   - (2a) Karmadharaya
   - (2b) Dwigu
   - (2c) Paradi Tatpurusha
   - (2d) Gatitatpurusha
   - (2e) Upapada Tatpurusha
3. Bahuvrihi
4. Avyayibhava

CONJUGATONS

Ist Conjugations – Bhoo, Gam, Shtha, Drhs Labh, Mud,

IInd Conjugation – As ( )
IIIrd Conjugation – Yudh,
IV th Conjugation – Ish
VIII Conjugation – Likh, Kri ( )
IXth Conjugation – Kreen ( )
Xth Conjugation – Kath, Bhash, Ram, Vand,

COURSE OUTCOMES

1. The student learns reading and writing Sanskrit
2. Understands and learns proper use of Grammar
3. Develops communication Skills.

LANG1111	TELUGU	L	T	P	S	J	C
		3	0	0	0	0	3
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

INTRODUCTION

This course contains a rich selection from Telugu language and literature.

COURSE OBJECTIVES

1) To enlighten students about the richness and value of the regional language
2) To offer working knowledge of Telugu to the students.

Syllabus

ప్రాచీనకవిత్వం:

1. నన్నయ - గవంగాశవంతనులకథ
   ఆవంధ్రమహాభారతవం- ఆదిపర్వం- నాళ్ళవఆశ్వాసవం(120-165) ''నరనరుడగుశవంతనునకు'' వండి ''దివ్యభూషణాలవంకృత '' వరకు
2. తిక్కన - మూషికమార్జాలవృత్తవంతవం
   ఆవంధ్రమహాభారత్తవం- శ్వంతిపర్వం - డవఆశ్వాసవం(202 - 242) అడవిలోనొకమఱ్ఱి నువండిసాఖ్యము బవందెన్.
3. అల్లసానిపెద్దన - హవంసీచక్రవాకసవంవాదవం
   మనుచరిత్రము- ఆరవఆశ్వాసవం(62-68) ''గవంగాతరవంగిణి'' నువండి''జవంభారిభిదురసవంరవంభవంబు'' వరకు
4. తరిగవండవవంగమావంబ - ఎఱుకతశ్రీవవంకటాచలమాహాత్మ్యంఆశ్వాసవం(4-51) ''వకుళనునేనావివాహప్రయత్నవంబు'' వండి''అనియిట్ల'' వరకు ఆధునికకవిత్వం
5. గరిమెళ్ళసత్యనారాయణ - మాకొద్దతెల్లదొరతనము
6. శ్రీశ్రీ - మహాప్రసాథానవం
7. జాషువ - ముసాపరులు
8. పుట్టపరితనారాయణాచార్యులు - మేఘదూతముకథానికలు
9. పాలగుమ్మపద్మరాజు - గాలివాన
10. కొలకటూరిఇనాక్ - ఆకలి
11. కేతువిశ్వాథరెడ్డి - నమ్మకున్ననేల
12. పాట్లపల్లీలరామ్మూర్తి - జైలువ్యయకరణవం
13. సవంధులు - సవర్ణద్ర్వ, గుణ, యణాదేశ, వృదిధి, త్రిక, గ, స, డ, దవాదేశ, రుగాగమ, ట్గాగమ, ఆమ్రేడిత, ఆత్సవంధిమొదలైనవి.
14. సమాసాలు - తతుపురుష, కర్మధారయ, ద్వంధ్, దిగు, బహువ్రీహీ. మొదలైనవి

COURSE OUTCOMES

1) The student learns reading and writing Telugu
2) Understands and learns proper use of Grammar
3) Develops communication Skills.

Programme Core

OPTS 1011	CALCULUS-1	L	T	P	S	J	C
		4	0	0	0	0	4
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course is designed for students of business and economics. This course introduces the basic concept of limit and its application to continuity, differentiation, integration, maximization, minimization, and partial derivatives. Applications to the social sciences, especially business and economics, are stressed. The calculus of trigonometric functions is not covered.

Course Educational Objectives:

- Understand basic knowledge of limits and continuity of mathematical functions.
- Apply the properties of derivatives and their applications
- Analyse and enhance problem-solving skills using the tools of differentiation
- Evaluate the provide the skills necessary for success in subsequent mathematics courses.
- Evaluate competitive advantage for the business

UNIT 1 **Basic mathematics** **13 Hours**

Introduction of basic concepts of definition indices and properties, Set, Relation, functions, fundamental of Trigonometric.

UNIT 2 **Limits and Continuity** **10 Hours**

Introduction, Interval and neighborhoods, Limits, and Continuity.

UNIT 3 **Methods of differentiation** **12 Hours**

Introduction, Derivative as a rate of change, Slopes Derivative of a function, Elementary properties, Some Differentiation Formulas- The Product and Quotient Rules, Higher Order Derivatives, The Chain Rule.

UNIT 4 **Differentiation** **12 Hours**

Successive differentiation- Second order derivatives, a derivative of implicit functions, Partial derivative of first and second order derivatives.

UNIT 5 **Application of derivatives** **13 Hours**

Geometrical interpretation of a derivative, Equation of tangents and normal, Lengths of tangent, normal, sub tangent and subnormal, Angles between two curves and condition for orthogonally of curves, problems involving maxima and minima values.

Textbooks:

1. CALCULUS, 9th Edition, by Anton, Bivens, and Davis.

2. Calculus Dr.A. Anjneyulu, K. Sambasiva Rao and K. Sai Prasad, Deepti publication

References:

1. Calculus Dr.T.K.V.Iyengar, S . Chand Publishing
2. R.C. Joshi (2013.), Business Mathematics, Jalandhar: New Academic Publishing Co.

Course Outcomes:

After successful completion of the course the student will be able to:

1. 1.Understand the fundamental knowledge of Basic Mathematics
2. Apply Limit and Continuity in solving business problems.
3. Evaluate algebraic facility with algebraic topics like linear, quadratic, exponential, and logarithmic Distinguish different concepts in logic programming
4. Analyze the basics of business economics and its role in business decisions
5. Evaluate the basic concepts of Equation of tangents and normal, Lengths of tangent, normal, sub tangent and subnormal, and their role in business decisions.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	1	0	0	0	0	2	0	2	2	2
CO2	2	1	0	0	0	0	2	0	2	2	2
CO3	2	1	0	0	0	0	2	1	2	2	2
CO4	2	1	1	0	0	0	2	1	2	2	2
CO5	2	1	1	0	0	0	2	1	2	2	2

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:
BOS : 28-04-2021 **ACADEMIC COUNCIL: 01-04-2022**

SDG No. & Statement: 4

SDG Justification:

BUAN1001	PROGRAMMING IN C++	L	T	P	S	J	C
		3	0	0	0	0	3
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

C++ is a general purpose programming language and has imperative, object-oriented and generic programming features. Understanding the concepts in C++ would lay the foundation for learning the other programming languages.

Course Educational Objectives:

- To acquaint the students with the programming concepts of C++
- To give hands on experience in writing basic programs in C++
- To enable students to write OOP programs in C++
- To enable students to work with C++ files
- To enable students to perform exception handling in C++

UNIT 1 Introduction to C++ 7 Hours

C++ characteristics, Identifiers and Keywords, Basic Data Types, Variables and Constants, Input and Output Statements, Operators and Expressions

UNIT 2 Control Structures 7 Hours

Conditional Statements, Looping Statements; Arrays – Single dimensional, Multi dimensional, Working with Strings, Functions, Recursion, Pointers, Structures in C++

UNIT 3 Object Oriented Programming 7 Hours

Object Oriented Concepts, Classes and Objects, Constructors and Destructors, Inheritance – Single Inheritance, Multiple Inheritance, Protected Keyword, Polymorphism

UNIT 4 C++ Files and Streams 7 Hours

Opening a File, Writing to a File, Reading from a File, Managing I/O Streams

UNIT 5 Exception handling 7 Hours

Throwing an exception, catching an exception: The try block, Exception handler

Textbooks:

1. Balagurusamy E, Object Oriented Programming with C++, McGraw Hill

References:

1. Herbert Schildt, C++: The Complete Reference, McGraw Hill
2. Robert Lafore, Object Oriented Programming in C++, Pearson Education

Course Outcomes:

After successful completion of the course the student will be able to:

1. Write basic programs in C++
2. Write programs with control structures in C++
3. Write OOP based programs in C++
4. Work with files in C++
5. Apply exception handling in C++ programs

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2	0	0	0	0	0	2	0	1	2	2
CO2	2	0	0	0	0	0	2	0	1	2	2
CO3	2	0	0	0	0	0	2	0	1	2	2
CO4	2	0	0	0	0	0	2	0	1	2	2
CO5	2	0	0	0	0	0	2	0	1	2	2

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS : 28-04-2021 **ACADEMIC COUNCIL: 01-04-2022**

SDG No. & Statement: 4: Quality Education

SDG Justification:

The modules and topics mentioned in this course are designed to ensure all-inclusive and thorough education with equity for all persons and promote learning opportunities at all times.

OPTS 1061	CALCULUS-2	L	T	P	S	J	C
		4	0	0	0	0	4
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Sequence of differential and integral calculus with applications. The course covers the techniques and applications of integration, the transcendental functions, and their inverses, as well as an introduction to the differential equation

Course Educational Objectives:

- Understand basic techniques for solving ordinary differential equations and applications.
- Apply advanced techniques of integration and estimation of definite integrals.
- Analyse and investigate important integration applications, such as arc length, area of surfaces, and volume of solids.
- Evaluate the calculus of exponential, logarithmic, and inverse trigonometric functions.
- Evaluate competitive advantage for the business.

UNIT 1 Successive differentiation 13 Hours

Introduction, Successive differentiation – nth derivatives, Leibnitz theorem and its application

UNIT 2 Indefinite integration 10 Hours

Standard forms, properties of integrals, Methods of substitution – integration of algebraic, Exponential, logarithmic, trigonometric, and inverse trigonometric functions, integration by parts, integration – partial fraction methods

UNIT 3 Definite integration 12 Hours

The definite integrals, interpretation of definite integral as an area, Fundamental theorem of integrals calculus, properties of calculus

UNIT 4 Applications of integration 12 Hours

Areas under and between curves, integration using partial fractions, integration by parts, Some Business applications.

UNIT 5 Differential Equations 13 Hours

Formation of differential equations – Degree and order of an ordinary differential equation, Solving differential equation by Variable separable method, Homogeneous differential equation, non-Homogeneous differential equation, First and Second Order Linear Differential Equations with constant coefficients

Textbooks:

1. CALCULUS, 9th Edition, by Anton, Bivens, and Davis.
2. Calculus Dr.A. Anjneyulu, K. Sambasiva Rao and K. Sai Prasad, Deepti publication

References:

1. Calculus Dr.T.K.V.Iyengar, S . Chand Publishing
2. R.C. Joshi (2013.), Business Mathematics, Jalandhar: New Academic Publishing Co.

Course Outcomes:

After successful completion of the course the student will be able to:

1. Understand fundamental knowledge about Successive differentiation
2. Apply knowledge of indefinite integration in solving business problems
3. Explain and do modeling of Business Applications
4. Analyse the application of integration in Business Problems
5. Evaluate the linear differential equations with constant coefficient

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	1	0	0	0	0	2	0	2	2	2
CO2	2	1	0	0	0	0	2	0	2	2	2
CO3	2	1	0	0	0	0	2	1	2	2	2
CO4	2	1	1	0	0	0	2	1	2	2	2
CO5	2	1	1	0	0	0	2	1	2	2	2

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:
BOS : 28-04-2021 **ACADEMIC COUNCIL: 01-04-2022**

SDG No. & Statement: 4

SDG Justification:

BUAN1011	DATA STRUCTURES WITH C++	L	T	P	S	J	C
		3	0	0	0	0	3
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Data Structure is a particular way of organizing data in a computer so that it can be used efficiently. Understanding the data structure will help in efficiently managing the data and coming up with effective algorithms. The implementation of data structures are done in C++, one of the most popular object oriented language.

Course Educational Objectives:

- To understand how to calculate time complexity of different algorithms
- To understand how to work with Linked Lists
- To implement Stack and Queue in C++
- To perform Searching and Sorting using C++
- To understand different concepts in trees and graphs

UNIT 1 Introduction to Data Structures 7 Hours

Basic Concepts, Classification of Data Structures, Algorithm: Basics, Algorithm Complexity and Asymptotic Analysis, Types of Algorithms – Greedy Algorithms, Divide and Conquer, Dynamic Programming

UNIT 2 Linked Lists 7 Hours

Concept, Types of Linked List – Single, Double, Circular, Operations in Linked List, Applications of Linked List

UNIT 3 Stack and Queue 7 Hours

Concept, Operations on stack, Array representation, Linked List representation, application of stacks, Queues - Concept, operation on queues, types of queues, Array representation, Linked List representation application of queues

UNIT 4 Searching and Sorting 7 Hours

Introduction to searching – Linear search, Binary Search, Sorting – Bubble, Insertion, Selection, Quick, Hashing

UNIT 5 Trees and Graphs 7 Hours

Trees - Basic terminology, Types of trees – General trees, Forest, Binary Tree, Binary Search tree, Creating binary tree from general tree, traversing a binary tree, application of trees, Graphs - Basic terminology, Directed graph, representation of graph, graph traversal algorithms, Application of graphs

Textbooks:

1. Adam Drozdek, Data Structures and Algorithms in C++, Cengage Learning

References:

1. Mark Allen Weiss, Data Structures and Algorithm Analysis in C++, Pearson Education
2. Seymour Lipschutz, Data Structures (Schaum's Series), McGraw Hill Education

Course Outcomes:

After successful completion of the course the student will be able to:

1. Distinguish different types of data structures
2. Describe different applications of Linked Lists
3. Distinguish between Stack and Queue
4. Distinguish between different sorting and searching algorithms
5. Distinguish different types of trees and graphs

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2	0	0	0	0	0	2	0	1	2	2
CO2	2	0	0	0	0	0	2	0	1	2	2
CO3	2	0	0	0	0	0	2	0	1	2	2
CO4	2	0	0	0	0	0	2	0	1	2	2
CO5	2	0	0	0	0	0	2	0	1	2	2

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS : 28-04-2021 **ACADEMIC COUNCIL: 01-04-2022**

SDG No. & Statement: 4: Quality Education

SDG Justification:

The modules and topics mentioned in this course are designed to ensure all-inclusive and thorough education with equity for all persons and promote learning opportunities at all times.

BUAN1021	Data Analysis with MS Excel	L	T	P	S	J	C
		3	0	0	0	0	3
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Business analytics refers to the skills and technologies for exploring and investigating large amount of data to attain new insights that will help an organization to gain a competitive edge. MS Excel is spreadsheet software that is used by many companies to perform basic analysis.

Course Educational Objectives:

- To understand importance of Business Analytics
- To understand how to perform basic operations in Excel
- To understand how to perform basic statistical analysis with Excel
- To understand how to perform what if analysis
- To understand how to work with Pivot tables and charts

UNIT 1 Introduction to Business Analytics 7 Hours

Benefits of Business Analytics, Types of Data – Structured, Semi Structured and Unstructured, Application areas of Business Analytics, Categorization of Analytical methods and models – Descriptive, Diagnostic, Predictive and Prescriptive

UNIT 2 Working with MS Excel 7 Hours

Uses of Excel, Working with MS Excel Workbook, Worksheet Management, Sorting, Filters, Conditional Formatting, Working with Charts, Trend lines

UNIT 3 Working with Excel Functions 7 Hours

Text Functions, Logical Functions, Lookup Functions, Math Statistical Functions

UNIT 4 Statistical Analysis with Excel 7 Hours

Working with Statistical Functions, Descriptive Statistics in Excel, Using Data Analysis Tool pack in Excel

UNIT 5 What if Analysis and Pivot Tables 7 Hours

Data Tables, Scenario Manager, Goal Seek, Creating PivotTables, Working with Pivot Charts, Working with Power Pivot

Textbooks:

1. Wayne L. Winston, Microsoft Excel - Data Analysis and Business Modeling, Prentice Hall of India

References:

1. Paul Mcfedris, Excel Data Analysis Visual Blueprint, Wiley

Course Outcomes:

After successful completion of the course the student will be able to:

1. Distinguish different types of Business Analytics
2. Identify different components of Excel
3. Apply different functions in Excel
4. Perform statistical analysis in Excel
5. Distinguish different programs under what-if analysis

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2	0	0	0	0	0	2	2	2	2	2
CO2	2	0	0	0	0	0	2	1	2	2	2
CO3	3	0	0	0	0	0	2	2	3	3	3
CO4	3	0	0	0	0	0	2	2	3	3	3
CO5	3	0	0	0	0	0	2	2	3	3	3

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS : 28-04-2021 **ACADEMIC COUNCIL: 01-04-2022**

SDG No. & Statement: 4: Quality Education

SDG Justification:

The modules and topics mentioned in this course are designed to ensure all-inclusive and thorough education with equity for all persons and promote learning opportunities at all times.

OPTS 2011	DISCRETE MATHEMATICS	L	T	P	S	J	C
		3	0	0	0	0	3
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

To introduce the students to the topics and techniques of discrete methods and combinatorial reasoning. To introduce a wide variety of applications. The algorithmic approach to the solution of problems is fundamental in discrete mathematics, and this approach reinforces the close ties between this discipline and the area of computer science.

Course Educational Objectives:

- Understand to demonstrate skills in solving mathematical problems
- Apply to comprehend mathematical principles and logic
- *Analyze to demonstrate knowledge of mathematical modeling and proficiency in using mathematical software
- Evaluate to communicate effectively mathematical ideas/results verbally or in writing
- Evaluate competitive advantage for the business

UNIT 1 Mathematical Logic 13 Hours

Propositional Calculus: Statements and Notations, Connectives, Well Formed Formulas, Truth Tables, Tautologies, Equivalence of Formulas, Duality Law, Tautological Implications, Normal Forms, Theory of Inference for Statement Calculus, Consistency of Premises, Predicate Calculus: Predicative Logic, Statement Functions, Variables, Free and Bound Variables,

UNIT 2 Set Theory 10 Hours

Introduction, Operations on Binary Sets, Principle of Inclusion and Exclusion, *Relations:* Properties of Binary Relations, Relation Matrix, Operations on Relations, Partition and Covering, Transitive Closure, Equivalence, Compatibility and Partial Ordering Relations, Hasse Diagrams, *Functions:* Bijective Functions, Composition of Functions, Inverse Functions.

UNIT 3 Combinatorics 12 Hours

Basic of Counting, Permutations, Permutations with Repetitions, Circular Permutations, Restricted Permutations, Combinations, Restricted Combinations, Generating Functions of Permutations and Combinations, Binomial Coefficients, Binomial Theorem.

UNIT 4 Recurrence Relations 10 Hours

Generating Functions, Function of Sequences, Partial Fractions, Calculating Coefficient of Generating Functions, Recurrence Relations, Formulation as Recurrence Relations.

UNIT 5 Graph Theory 10 Hours

Basic Concepts of Graphs, Sub graphs, Matrix Representation of Graphs: Adjacency Matrices, Incidence Matrices, Isomorphic Graphs, Paths and Circuits, Eulerian and Hamiltonian Graphs, Euler's Formula.

Textbooks:

1. Discrete Mathematical Structures with Applications to Computer Science, J. P. Tremblay and P. Manohar, Tata McGraw Hill.
2. Elements of Discrete Mathematics-A Computer Oriented Approach, C. L. Liu and D. P. Mohapatra, 3rdEdition, Tata McGraw Hill.

References:

1. Discrete Mathematics and its Applications with Combinatorics and Graph Theory, K. H. Rosen, 7th Edition, Tata McGraw Hill.
2. Discrete Mathematics for Computer Scientists and Mathematicians, J. L. Mott, A. Kandel, T.P. Baker, 2nd Edition, Prentice Hall of India.

Course Outcomes:

After successful completion of the course the student will be able to:

1. Understand the basics of Connectives, Construction of truth tables
2. Apply and use the terms cardinality, finite, countably infinite, and unaccountably infinite, and determine which of these characteristics is associated with a given set.
3. Evaluate sequences and find general terms. Finding binomial coefficients
4. Analyze and solve recurrences, relations by substitution
5. Apply the basic concepts of knowing about the walk, trial, path, cycle, and circuit of a graph

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	1	0	0	0	0	2	0	2	2	2
CO2	2	1	0	0	0	0	2	0	2	2	2
CO3	2	1	0	0	0	0	2	1	2	2	2
CO4	2	1	1	0	0	0	2	1	2	2	2
CO5	2	1	1	0	0	0	2	1	2	2	2

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlatio

APPROVED IN:

BOS : 28-04-2021 **ACADEMIC COUNCIL: 01-04-2022**

SDG No. & Statement: **4**

SDG Justification:

OPTS 2021	STATISTICAL METHODS	L	T	P	S	J	C
		4	0	0	0	0	4
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Business Statistics is important, for future managers, to have a firm understanding of the basics of statistics and its application to analyse and create an edge for the business. Student will be able to understand the measurement systems variability, control processes (as in statistical process control orSPC). The student should summarize data, and to make data-driven decisions.

Course Educational Objectives:

- Understand the measurement systems variability
- Apply basic statistical techniques to measure relative changes in price, production, or any such quantities of economic interest.
- Analyze statistical techniques to analyze business problems.
- Evaluate the summarizing data, Evaluate and make data-driven decisions
- Create of a Time series analysis and measure different trends in data series and examine the relationship between two quantitative variables

UNIT 1 Measures of Central Tendency 13 Hours

Introduction, Arithmetic mean, geometric mean, harmonic mean, median, mode. Measures of Dispersion: Introduction, Range, Quartile deviation, mean deviation, Standard deviation, combined mean and combined standard deviation.

UNIT 2 Correlation Analysis 10 Hours

Introduction, types of correlation, Methods of Correlation analysis, Scatter diagram method, Karl Pearson's correlation coefficient, oefficient of determination, Spearman's rank correlation coefficient.

Regression Analysis: Introduction, Types of regression models, Significance of Regression Analysis, Methods of finding Regression Equations, Least Squares and Using Regression Coefficient methods, Prediction using the Regression Equations.

UNIT 3 Probability 12 Hours

Probability – Definitions of various terms, Types of probability, Bayes 'Theorem. Random variable and Probability Distribution – Definition, Probability distribution of discrete and continuous random variable, Mean and Variance. Discrete distribution – Introduction, Binomial distribution, Poisson distribution, Mean and Variance. Continuous distribution– Normal distribution, Properties of Normal distribution, Area under Standard Normal Probability Curve and Importance of Normal Distribution.

UNIT 4 **12 Hours**

Index numbers, Introduction, Characteristics and Uses of index numbers, Types of Index Numbers, Laspyre's, Paasche's, Fisher's, Marshall-Edgeworth, Dorbish and Bowley, Limitations of index numbers.

UNIT 5 **13 Hours**

Time series analysis – Introduction, Components of a time series – Secular trend, Short term, Random or Irregular variations, Measurement of trend – Free hand method, Method of linear Curve fitting by the principle of least squares, Method of Semi - Averages and Moving average.

Note: Proofs of theorems and derivations of problems and distributions are excluded.

Textbooks:

1. Gupta, S.C. & Gupta, I. (2012), Business Statistics, Mumbai: Himalaya Publishing House.
2. J.K Sharma (2013), Business statistics, New Delhi: Pearson Education.

References:

1. Levine, D.M., Berenson, M. L. & Stephan, D. (2012), Statistics for managers using Microsoft Excel, New Delhi: Prentice Hall India Pvt.
2. Aczel, A. D. &Sounderpandian, J. (2011), Complete Business Statistics, New Delhi: Tata McGraw Hill.
3. Anderson, D., Sweeney, D., Williams, T., Camm, J., & Cochran, J. (2013), Statistics for Business and Economics, New Delhi: Cengage Learning.
4. Davis, G., &Pecar, B. (2014), Business Statistics using Excel, New Delhi: Oxford University Press.

Course Outcomes:

After successful completion of the course the student will be able to:

1. Understanding the basics of central tendency and measure of dispersion.
2. Applying correlation and regression analysis in real-life business applications.
3. Analyzing the properties of normal distribution
4. Applying the index methods in real-life business applications
5. Evaluation of various methods of components trend in time series analysis

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	1	0	0	0	0	2	0	2	2	2
CO2	2	1	0	0	0	0	2	0	2	2	2
CO3	2	0	0	0	0	0	2	1	2	2	2
CO4	2	0	0	0	0	0	2	1	2	2	2
CO5	2	0	0	0	0	0	2	1	2	2	2

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:
BOS : 28-04-2021 **ACADEMIC COUNCIL: 01-04-2022**

SDG No. & Statement: **4 & 8**

SDG Justification:

BUAN2021	DATA VISUALIZATION WITH TABLEAU	L	T	P	S	J	C
		3	0	0	0	0	3
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Data Visualization is the presentation of data in a pictorial or graphical format. Today analysts are required to deal with large amount of data. Visualization helps in presenting the data in pictorial or graphical format. Such visual representation will help in providing better insights to the decision maker. Tableau is popular visualization tool to create visual data.

Course Educational Objectives:

- Understand and design data visuals with different visual encodings
- Understand the usage of different visual encoding
- Work with User defined fields
- Customize the presentation with different elements in Tableau

UNIT 1 Introduction to Visualization 7 Hours

Concept and importance of data visualization, Choosing appropriate visual encodings – ordering of items, number of distinct values, structure of visualization, Positioning - Placement and Proximity, Graphs and Layouts, Colors, Size, Text and Typography, Shape, Lines.

UNIT 2 Working with Tableau Data Source and Basic Charts 7 Hours

Introduction to Tableau, Connecting to Data Source: Text Files, Excel, Access, other databases, merging multiple data sources, Univariate Charts – Creating tables, bar graphs, pie charts, histograms, line charts, stacked bar graphs, box plots, Showing aggregate measures, Bivariate Charts – Creating tables, scatter plots, swapping rows and columns, adding trend lines, selecting color palettes, using dates

UNIT 3 Fields, Hierarchies &Filters 7 Hours

Using predefined fields, calculating percentages, applying if-then logic, applying logical functions, showing totals and percentages, discretizing data, manipulating text, aggregate data. Grouping and creating hierarchies in Tableau. Creating and using Filters in Tableau.

UNIT 4 Multivariate Charts and Maps 7 Hours

Facets, area charts, bullet graphs, dual axes charts, Gnatt charts, heat maps, Maps – Setting geographical roles, placing marks on map, overlaying demographic data, choropleth maps, polygon shapes, customizing maps

UNIT 5 Dashboards in Tableau 7 Hours

Adding title and caption, font size and colors, adding various marks, adding reference lines, using presentation mode, adding annotation, adding drop-down selectors, search box selectors, slider selectors, creating dashboards, creating animated visualizations. Connecting and using Tableau Public Server.

Textbooks:

1. Tableau Data Visualization Cookbook by Ashutosh Nandeshwar
2. Designing Data Visualizations by Noah Iliinsky and Julie Steele

References:

1. Storytelling with Data: A Data Visualization Guide for Business Professionals by Cole Nussbaumer Knaflic
2. Iliinsky, N. & Steele, J. (2012), Designing Data Visualizations, Mumbai: O'Reilly / Shroff Publishers.
3. Milligan, N.J. (2015), *Learning Tableau*, Mumbai: PACKT / Shroff Publishers.
4. Jones, B. (2014), *Communicating Data with Tableau*, Mumbai: PACKT / Shroff Publishers

Course Outcomes:

After successful completion of the course the student will be able to:

1. To understand the concept and benefits of visualization
2. Understand and design data visuals with different visual encodings
3. Create different types of charts and maps in Tableau
4. Work with User defined fields
5. Customize the presentation with different elements in Tableau

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2	0	0	0	0	0	2	0	2	2	2
CO2	2	0	0	0	0	0	2	0	2	2	2
CO3	2	0	0	0	0	0	2	0	2	2	2
CO4	2	0	0	0	0	0	2	0	2	2	2
CO5	2	0	0	0	0	0	2	0	2	2	2

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS : 28-04-2021 **ACADEMIC COUNCIL: 01-04-2022**

SDG No. & Statement: 9: Industry, Innovation and Infrastructure

SDG Justification:

This course is related to visualization, which helps in understanding the data better and to provide useful insights, practice of data analytics, and digital infrastructure in the industry. So, this course might help for building resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

BUAN2031	DATA ANALYSIS WITH R	L	T	P	S	J	C
		4	0	0	0	0	4
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

R is an open source programming language for statistical computing and graphics. Being open source, it has found huge acceptance among data scientists and is one of the popular tool for data science and machine learning.

Course Educational Objectives:

- Understand the programming concepts of R
- Understand various data types and their usage through R.
- Understand control structure and its usage for data processing.
- Perform statistical analysis using the R platform.
- Make plots and practice visualization using R

UNIT 1 Introduction to R 8 Hours

Concept of R, Installing R, IDE of R, Getting help from R, Mathematical Operators and Vectors, Assigning Variables, Special Numbers, Logical Vectors, Classes, Different types of numbers, Changing classes, Examining Variables, The workplace, Vectors – Sequences, Lengths, Names, Indexing Vectors, Vector Recycling and Repetition, Matrices and Arrays – Creating Arrays and Matrices, Rows, Columns, Dimensions, Indexing Arrays, Combining Matrices, Array Arithmetic,

UNIT 2 Lists, Functions, Strings and Factors 8 Hours

Lists – Creating lists, Automatic and recursive variables, List dimensions and arithmetic, indexing lists, Conversion between vectors and lists, Combining lists, NULL, Pairlists, Data Frames – Creating Data Frames, Indexing Data Frames, Basic Data Frame Manipulation, Environments, Functions – Creating and Calling Functions, Passing functions, variable scope, Strings – Constructing and printing strings, Formatting numbers, Special characters, Changing case, Extracting Substrings, Splitting Strings, File paths, Factors – Creating, factor levels, ordered factors, conversion of variables

UNIT 3 Flow Controls 8 Hours

Conditional – if and else, Vectorized if, Multiple Selection, Loops – repeat loops, while loops, for loops, Advanced looping – replication, looping over lists, looping over arrays, Multiple – Input Apply, Instant vectorization, Split-Apply-Combine

UNIT 4 **Statistics with R** **8 Hours**

Summarizing data, Calculating relative frequencies, Tabulating Factors and creating contingency tables, Testing categorical variables for independence, Calculating Quantiles of a dataset, Converting data into z-scores, t-test, testing sample proportions, testing normality, comparing means of two samples, testing correlation for significance, Linear regression in R, Logistic Regression in R Clustering with R

UNIT 5 **Packages and Visualization** **8 Hours**

Loading packages, search path, libraries and installed packages, installing packages, maintaining packages, Visualization – The three plotting systems, Scatterplots – base graphics, lattice graphics, ggplots, Line Plots, Histograms, Box Plots, Bar Charts, Other plotting packages and systems

Textbooks:

1. The Art of R Programming by Norman Matloff

References:

1. The Book of R: A First Course in Programming and Statistics by Tilman M. Davies

Course Outcomes:

After successful completion of the course the student will be able to:

1. Understand the aspects such as syntax, data types and structures, control structures and loops of Python language.
2. Understand OOP concepts and apply on several business use cases.
3. Understand data sets and matrices and handling them using Python packages such as Numpy, Pandas.
4. Perform statistical analysis on various business-related data sets using Scipy package.
5. Understand importance of visualization and use visualization techniques for several business use cases.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	0	0	0	0	0	2	0	1	2	1
CO2	2	0	0	0	0	0	2	0	1	2	1
CO3	2	0	0	0	0	0	2	0	2	3	1
CO4	3	0	0	0	0	0	3	0	3	3	3
CO5	2	0	0	0	0	0	2	0	2	3	3

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS : 28-04-2021 **ACADEMIC COUNCIL: 01-04-2022**

SDG No. & Statement: 9: Industry, Innovation and Infrastructure

SDG Justification:

This course is related to programming, which is considered important for IT applications, practice of data analytics, and digital infrastructure in the industry. So, this course might help for building resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

BUAN2041	PREDICTIVE ANALYTICS AND DECISION MAKING	L	T	P	S	J	C
		4	0	0	0	0	4
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Predictive Analytics is a discipline that deals with the application of statistical and machine learning techniques on historical data to predict future outcomes. In this competitive age, predictive analytics not only helps in making informed decisions and solve business problems but also to have an edge over the competitors.

Course Educational Objectives:

- Understand the basic statistical techniques required for forecasting
- Understand the basic concepts of Probability and Statistics
- Provide understanding in some basic statistical techniques which areused for solving business problems.
- Apply these techniques constructively to make effective business decisions
- Apply the analytical techniques in business transactions that would help in making effective business decisions

UNIT 1 Hypothesis Testing 10 Hours

Introduction, Types of Hypothesis, Hypothesis Testing Procedure, One sample and Two sample Test for Mean (Students t-distribution and Z-test); Introduction to Chi-Square distribution, Chi-Square test for Goodness of fit and for Independence of Attributes

UNIT 2 Analysis of Variance 10 Hours

Introduction, Testing equality of population means (One –Way Classification), Testing equality of population means (Two –Way Classification)

UNIT 3 Multiple Correlation Analysis 10 Hours

Introduction, Significance of multiple correlation, Multiple and partial correlation, Relation between multiple and partial correlation coefficients.

UNIT 4 Multiple Regression Analysis 10 Hours

Introduction, Significance of Multiple Regression Analysis, Estimating the parameters ofMultiple Regression by method of Least Squares and Using Regression Coefficient methods,Relation between partial regression coefficients and correlation coefficients, Standard Error of Estimates for Multiple regression

UNIT 5 **Forecasting Trend** **10 Hours**

Introduction, Linear trend model, Exponential trend, Measurement of Seasonal effects – Method of Simple Average, Ratio-to-Trend Method, Ratio-to-Moving Average Method,Link Relative Method.

Textbooks:

1. J. Joseph Frrancis, Business *statistics*, New Delhi: Cengage Learning

References:

2. Bruce L. Bowerman, Richard T.O'Connell, Emily S. Murphree, *Business Statistics in practice*, New Delhi: McGraw HillEducation (India) Private Ltd.

3. David M.Levine, david Stephan Timothy C.Krehbiel, Mark l Berenson,*Statistics for managers using Microsoft Excel*, New Delhi:Prentice Hall India Pvt.

4. Amir D.Aczel, JayavelSounderpandian, *Complete Business Statistics*, New Delhi:Tata McGraw Hill.

5. S.P. Gupta &M.P. Gupta, *Business Statistics*, New Delhi: Sultan Chand & Sons.

Course Outcomes:

After successful completion of the course the student will be able to:

1. Understand the measurement systems variability
2. Apply basic statistical techniques to measure relative changes in price, production or any such quantities of economic interest
3. Use statistical techniques to analyse business problems
4. Solve forecasting problems
5. Make effective decisions using statistical techniques

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2	0	0	0	0	0	2	0	2	2	2
CO2	3	0	0	0	0	0	3	0	3	3	3
CO3	3	0	0	0	0	0	3	0	3	3	3
CO4	3	0	0	0	0	0	3	0	3	3	3
CO5	3	0	0	0	0	0	3	0	3	3	3

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS : 28-04-2021 **ACADEMIC COUNCIL: 01-04-2022**

SDG No. & Statement: 9: Industry, Innovation and Infrastructure

SDG Justification:

This course is related to forecasting and predictive analytics that might help for building resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

BUAN2051	ARTIFICIAL INTELLIGENCE	L	T	P	S	J	C
		3	0	0	0	0	3
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Artificial Intelligence has its foundation in Boolean algebra. With the introduction of computers, AI has gained prominence, where attempts were made to make computers think and reason like humans. It has come a long way from playing games to intelligent robots. This course aims to introduce the basic concepts of AI, Expert Systems and Machine Learning.

Course Educational Objectives:

- To understand the strategies of state space.
- To understand AI Knowledge representation.
- To understand expert systems, machine learning and fuzzy logic.

UNIT 1 Propositional and Predicate Calculus 7 Hours

Introduction to the Propositional and Predicate Calculus, Inference Rules and use for Predicate Calculus Expression

UNIT 2 State Space Search 7 Hours

Graph Theory, Strategies for State Space Search and Control Strategies, Heuristic Search, Monotonicity and Informedness

UNIT 3 Knowledge Representation 7 Hours

Recursion based search, Pattern-Directed search, AI Challenge Knowledge Representation, Problem reduction and game playing,

UNIT 4 Logic Programming 7 Hours

Logic Concepts and Logic Programming, Prolog Programming, Expert System and Applications, Uncertainty measurement: Probability Theory, Fuzzy Set and Fuzzy Logic

UNIT 5 AI Technologies 7 Hours

Machine Learning Paradigms, Artificial Neural Networks, Introduction to Intelligent Agents, Natural Language Processing.

Textbooks:

1. Wolfgang Ertel*, Introduction to Artificial Intelligence*, Springer

References:

1. Stuart Russel, Peter Norvig, *Artificial Intelligence A Modern Approach*, Prentice Hall Series
2. Michael Negnevitsky, *Artificial Intelligence*, Addison Wesley

Course Outcomes:

After successful completion of the course the student will be able to:

1. Discuss the concept of Propositional and Predicate Calculus
2. Distinguish different state space search
3. Distinguish different ways to represent knowledge
4. Distinguish different concepts in logic programming
5. Discuss the various applications of AI

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	1	0	0	0	0	2	0	2	2	2
CO2	2	1	0	0	0	0	2	0	2	2	2
CO3	2	0	0	0	0	0	2	0	2	2	2
CO4	2	0	0	0	0	0	2	0	2	2	2
CO5	2	0	0	0	0	0	2	1	2	2	2

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:
BOS : 28-04-2021 **ACADEMIC COUNCIL: 01-04-2022**

SDG No. & Statement: 4: Quality Education

SDG Justification:
The modules and topics mentioned in this course are designed to ensure all-inclusive and thorough education with equity for all persons and promote learning opportunities at all times.

BUAN2061	DATA ANALYSIS WITH PYTHON	L	T	P	S	J	C
		3	0	0	0	0	3
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Python is an open source high level interpreter based language. Python is interactive and object oriented language with wide range of applications. Python is commonly used in the area of data science and web based analytics.

Course Educational Objectives:

- to understand data types and control structures to handle different types of data in Python.
- to understand data structures and various ways to handle structures using functions and classes (OOP).
- to understand data sets and frames and learn various ways to process data sets using univariate and bivariate analysis.
- to learn data coding and editing using Pandas.
- to make various plots/visuals using matplotlib library.

UNIT 1 Introduction 7 Hours

Features of Python, Setting up path, Variables and Data types, Operators in Python, Input – Output Statements, Control Structures: Conditional Statements, Looping Statements, Control Statements

UNIT 2 Data Structures of Python 7 Hours

Strings, Lists, Tuples, Dictionaries, Functions: Defining and calling a function, Types of Function; Modules: Importing Module, Packages, Composition, Exception Handling. OOP Concepts and Regular Expressions: OOP concepts in Python, Regular Expressions: Match Function, Search Function, Matching Vs Searching, Modifiers, Patterns, Working with Database

UNIT 3 Python for Data Analysis - I 7 Hours

NumPy Basics: Arrays and Vectorized Computation, Pandas Basics: Working with Series and DataFrame; Scipy Basics: Random Variables, Building specific distributions, Univariate analysis, Bivariate and multivariate analysis.

UNIT 4 **Python for Data Analysis– II** **7 Hours**

Pandas for Data Analysis: I/O tools; Series, Data frames, arrys, Indexing & selecting data, Merge, Join and Concatenate; Reshaping and Pivot tables; Working with missing data; Working with numerical and categorical data.

UNIT 5 **Advanced Visualizations** **7 Hours**

Python packages for plotting and visualizations; Introduction to Matplotlib package; Subplots, axes and figures; Text, Labels and Annotations; Managing colors; Working with lines, dates and text on plots; Scatter plots; Pie and Polar charts; Bar charts and Histograms; Plotting discrete distributions; Plotting categorical variables; Plotting images, contours and fields; Visualizations for statistics; Animations.

Textbooks:

1. David Beazley and Brian K. Jones, Python Cookbook, O'Reilly

References:

1. Python official documentation (related to Core Python, Numpy, Scipy, Matplotlib)

2. Wes McKinney, Python for data analysis, O'Reilly, Online version

Course Outcomes:

After successful completion of the course the student will be able to:

1. Understand the aspects such as syntax, data types and structures, control structures and loops of Python language.
2. Understand OOP concepts and apply on several business use cases.
3. Understand data sets and matrices and handling them using Python packages such as Numpy, Pandas.
4. Perform statistical analysis on various business-related data sets using Scipy package.
5. Understand importance of visualization and use visualization techniques for several business use cases.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	0	0	0	0	0	2	0	1	2	1
CO2	2	0	0	0	0	0	2	0	1	2	1
CO3	2	0	0	0	0	0	2	0	2	3	1
CO4	3	0	0	0	0	0	3	0	3	3	3
CO5	2	0	0	0	0	0	2	0	2	3	3

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:
BOS :28th April, 2021 **ACADEMIC COUNCIL: 1st April, 2022**

SDG No. & Statement:
9: Industry, Innovation and Infrastructure
SDG Justification:
This course is related to programming, which is considered important for IT applications, practice of data analytics, and digital infrastructure in the industry. So, this course might help for building resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

OPTS2031	BUSINESS RESEARCH METHODOLOGY	L	T	P	S	J	C
		3	0	0	0	0	3
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Research methodology is the systematic and scientific method of how to review and research a topic. It starts with identification of the problem and continues with sample design, data collection, analysis and report. It is extensively used to find a solution to a problem and enhance knowledge. Continuous growth is one of the key challenges for business, which needs innovative ideas and solutions to stagnation in growth. Research is a valuable tool for businesses to identify potential avenues for growth and solutions to problems. Understanding the methodology to be adopted when researching is, therefore very crucial for businesses.

Course Educational Objectives:

- To enable the students to get familiarize with the concepts of Research Methodology
- To acquaint the students with the techniques of Research Methodology which are applicable to business arena

UNIT 1 Introduction 8 Hours

Meaning, Importance of Research, Types of research, Research Process-Problem of Identification-Formulation-Classification, Concept and Construction of Hypothesis- Steps in Testing Hypothesis.

UNIT 2 Research Design 10 Hours

Meaning, Purpose and Principles –Types of Research Design- Exploratory – Descriptive – Experimental; Sampling & Sampling Designs - Determination of Sample Size- Census Survey Vs Sample Survey-Advantages of Sampling – Sampling Methods-Probability Sampling-Non-Probability Sampling.

UNIT 3 Data Collection 10 Hours

Sources of Data - Methods of Data Collection – Questionnaire, Interview, Observation and Schedule; Sources of secondary data; Questionnaire Design and Pre-Testing of Questionnaire.

UNIT 4 Data Tabulation 10 Hours

Analysis and Interpretation: Editing, Decoding and Classification of Data-Preparation of Tables-Analysis of Data - Scaling Techniques - Graphic and Diagrammatic Representation of Data, Non-Parametric tests – Run test, Kolmogorov Smirnov test, Chi-Square test, one sample sign test, Man Whitney U Test.

UNIT 5 Research Analysis and Report Writing 7 Hours

Multiple Regression (General Linear Model), Principals of Component Analysis, Discriminate Analysis –Factor Analysis- Types of Reports- Contents of Report- Formats of Reports-Presentation of Reports.

Textbooks:

1. Kothari, C.R. (2012), *Research Methodology – Methods and Techniques*, New Delhi: New Age International Publishers.

References:

2. Boyd, H. W., Westfall, R. L., & Stasch, S. F. (2010), *Marketing Research: text and cases*, New Delhi: All India Travel Book Sellers.
3. Bryman, A. (2010), *Social Research Methods*, New Delhi: Oxford University Press.
4. Krishnaswami, O.R. (2011), *Methodology of Research in Social Sciences,* Mumbai: Himalaya Publishing House.

Course Outcomes:

After successful completion of the course the student will be able to:

1. Be able to interpret, define and formulate research problems and, formulate hypotheses that can be tested
2. Understand and apply a range of methods and to be able to decide on appropriate research designs and methods to investigate their chosen research problems
3. Understands the tools and techniques of data collection
4. Interpret the data and can apply testing of hypothesis
5. Understands the report writing and able to write the report in the required format.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	1	0	0	0	1	1	1	2
CO2	1	2	1	1	1	1	1	1	2	2	2
CO3	1	3	3	2	3	1	1	1	2	2	2
CO4	1	1	0	0	0	0	1	1	2	3	2
CO5	1	1	0	1	1	0	1	1	2	2	2

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:
BOS : 28-04-2021 **ACADEMIC COUNCIL: 01-04-2022**

SDG No. & Statement: **8 & 9**

SDG Justification:

OPTS3001	OPERATION RESEARCH	L	T	P	S	J	C
		4	0	0	0	0	4
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

This course will introduce you to some deterministic and probabilistic models in Operations Research. The course will focus on mathematical modelling and strong emphasis will be given to model formulation. The deterministic models include linear programming problems, transportation problems and Assignment's problems whereas Game theory, Simulation and Network models are covered in probabilistic models.

Course Educational Objectives:

- To familiarize students with the basic concepts, models and principles of the operations research theory.
- To develop skills in formulating and structuring decision-making problems as mathematical models.
- To understand the use of software for obtaining solutions of the models formulated and interpretation of results for better decision making.
- To use Excel-Solver software to solve the proposed models.
- Construct network diagrams with single and three time estimates of activities involved in a project

UNIT 1 Introduction 10 Hours

Nature and meaning of Operations Research, Management applications of Operations Research, main characteristics of Operations Research, scope of Operations Research, role of Operations Research in decision making.

UNIT 2 Linear Programming Problem 13 Hours

Introduction, mathematical formulation of LPP, general Linear Programming problem, Graphical Solution of LPP, Canonical and Standard Forms of LPP, solving LPP by Simplex Method.

UNIT 3 12 Hours

Transportation & Assignment Problems: Introduction of transportation problems, procedures of finding basic feasible and optimal solution – NW corner rule, minimum cost method, Vogel's Approximation, MODI method, Assignment Problem - introduction, solving of Assignment problem by Hungarian Algorithm.

UNIT 4 Game Theory and Simulation 13 Hours

Game theory: Introduction, Two Person Zero Sum Games, Pure Strategies, Dominance Principle, Graphical

Simulation: introduction, types of simulation, generation of random numbers, Monte Carlo Simulation, and waiting lines.

UNIT 5 Network Scheduling by PERT / CPM 12 Hours

Introduction, network and basic components, logical sequencing, rules of network construction, Critical Path Analysis, probability considerations in PERT, distinction between PERT and CPM.

Textbooks:

1. **.** Sharma, J.K. (2010), *Operations Research Theory and Applications*, New Delhi: Macmillan India limited.
2. R1: Sharma, S.D. (2012), *Operations Research*, Meerut: Kedar Nath Ram Nath & Co.

References:

1. Taha H. A., "Operations Research – An Introduction", 9th ed., Prentice Hall India.
2. **2**Gupta P. K., Hira D.S., "Operations Research", S Chand Publishers

Course Outcomes:

After successful completion of the course the student will be able to:

1. Identify the elements of a decision and various decision-making situations
2. Solve Linear Programming Problems
3. Solve initial feasible solution for transportation problems using several methods and optimal solution using MODI method
4. Understand the usage of game theory and Simulation for Solving Business Problems
5. Develop reports that describes the model and the solving technique, analyze the results and propose recommendations to the decision-making processes

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	1	0	0	0	0	2	0	2	2	2
CO2	2	1	0	0	0	0	2	0	2	2	2
CO3	2	1	0	0	0	0	2	1	2	2	2
CO4	2	1	1	0	0	0	2	1	2	2	2
CO5	2	1	1	0	0	0	2	1	2	2	2

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS : 28-04-2021 **ACADEMIC COUNCIL: 01-04-2022**

SDG No. & Statement: **8 & 9**

SDG Justification:

OPTS3011	STATISTICAL QUALITY CONTROL AND SIX SIGMA	L	T	P	S	J	C
		3	0	0	0	0	3
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Statistical quality control refers to the use of statistical methods in the monitoring and maintaining of the quality of products and services. SQC is used to analyze the quality problems and solve them. Six sigma measures the quality of business performance for processing a product. Business score card emphasize on the implementation of measurement system so that it can be used to write business performance.

Course Educational Objectives:

- To enable the students to understand and diagnose the levels or standards that depends on many factors and lack of quality while processing the end products.
- To enable them to evaluate various options in reaching financial decisions, whether personal or business- related.

UNIT 1 **13 Hours**

Introduction to control charts, process and product control, control charts, 3 control limits, tools for statistical quality control, creating control charts for variable.

UNIT 2 **10 Hours**

Construction of control charts for attributes, p-chart for fraction defective, d-chart for number of defective, interpretation of p-chart. Control charts for number of defects per unit:limits for c-chart, c-chart for variable sample size or u-chart, application c-chart and Natural tolerance limits and specification limits.

UNIT 3 **12 Hours**

Acceptance sampling by attributes- acceptance quality level, lot tolerance proportion or percent defective, process average fraction defective, consumers risk, producers risk, rectifying inspection plans, average outgoing quality limit, O.C curve, single sampling plan, double sampling plan and sequential sampling plan.

UNIT 4 **12 Hours**

Six sigma- Basics of six sigma, traditional approach of six sigma, break through approach to six sigma-measure, variation, cost of quality, six sigma measurements, Analyze, improve control: challenges in implementing six sigma.

UNIT 5 **13 Hours**

Elements of six sigma business score card: Leadership and profitability, Management and improvement, Employees and innovation, Purchasing and supplier management, Operational execution, Sales and distribution, Service and growth, Six sigma business score card and measurements, Business performance index, Corporate DPU and DPMO, Corporate sigma level.

Textbooks:

1. S.C. Gupta and V.K. Kapoor, Fundamentals of Applied Statistics, Sultan and Chand, New Delhi, 2017.
2. Praveen Gupta, Six Sigma Business Score card, Tata McGraw-Hill Publishing company limited, New Delhi, 2017

References:

1. Gupta and Kapoor, Fundamentals of applied statistics, Sultan and Chand,2017
2. Pathak and F. Resh, Demographic Methods, Sultan and Chand,2017
3. G. Harver, Lean Six Sigma For Beginners, A Quick-Start Beginner's Guide To Lean Six Sigma, Kindle Edition.
4. Daniel J. Zrymiak , GovindarajanRamu , Roderick A. Munro, The Certified Six Sigma Green Belt Handbook, 2nd Edition (With 2 CD- ROMs) Hardcover – 2015
5. Thomas Pyzdek , Paul Keller, The Six Sigma Handbook Hardcover – 30 Aug 2010

Course Outcomes:

After successful completion of the course the student will be able to:

1. Understand the fundamental knowledge of statistical quality control and six sigma
2. Apply the concepts of control charts in various manufacturing activities
3. Evaluate various defective and defect free items based on sampling criteria
4. Analyze the challenges of implementation of six sigma concepts in industries
5. Evaluate elements of six sigma business score card.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	1	0	0	0	0	2	0	1	3	2
CO2	2	1	1	1	0	0	1	0	2	0	1
CO3	0	2	0	0	0	0	2	1	0	3	0
CO4	1	0	1	0	0	0	1	0	0	0	0
CO5	2	1	2	0	0	0	3	1	2	2	3

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS : 28-04-2021 **ACADEMIC COUNCIL: 01-04-2022**

SDG No. & Statement: **4 & 12**

SDG Justification:

BUAN3001	MACHINE LEARNING	L	T	P	S	J	C
		3	0	0	0	0	3
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Machine learning is an application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without being explicitly programmed.

Course Educational Objectives:

- Understand machine learning theories in general
- Understand and practice few supervised machine learning algorithms
- Understand and practice few unsupervised machine learning algorithms
- Understand and practice few deep learning algorithms
- Practice various machine learning algorithms specific to a particular field of operations.

UNIT 1 Introduction to Machine Learning 7 Hours

Basics of Machine Learning, Categories of Machine Learning, Steps in Machine Learning, The Machine Learning process, Train and Test Data

UNIT 2 Supervised Learning 7 Hours

Linear Regression, Logistic Regression, Decision Trees, Naïve Bayes Algorithm, K Nearest Neighbour (KNN), Random Forest, Rule based learning: Apriori Algorithm

UNIT 3 Unsupervised Learning 7 Hours

Clustering - K-Means Clustering, Anomaly Detection, Expectation – Maximization (EM) algorithm, Introduction to Semi Supervised and Reinforcement Learning

UNIT 4 Introduction to Deep Learning 7 Hours

Concept, Artificial Neural Networks: Basic Structure of ANN, Types of ANN, Defining and Training of ANN

UNIT 5 Applications of Machine Learning 12 Hours

Sales and Marketing, Financial Services, Social Media Management, Self Driving Cars, Fraud Detection

Textbooks:

1. Saikat Dutt, Subramaniyam Chandramouli, Amit Kumar Das, Machine Learning, Pearson Education

References:

1. E. Alpaydin, Introduction to machine learning, 3rd edition, The MIT Press.
2. Doug Hudgeon Richard Nichol, Machine Learning for Business. Manning Publications Co.
3. Andreas C. Müller & Sarah Guido, Introduction to Machine Learning with Python. by O'Reilly Media, Inc.
4. Kevin Gurney, An introduction to neural networks. UCL Press Limited.
5. S Haykin, Neural Networks and machine learning. Pearson

Course Outcomes:

After successful completion of the course the student will be able to:

1. Understanding on machine learning concepts and theories.
2. Train and test data sets using supervised machine learning algorithms
3. Train and test data sets using unsupervised machine learning algorithms
4. Train and test data sets using artificial neural networks
5. Practice various machine learning algorithms specific to a particular field of operations.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	0	0	0	0	0	2	0	1	2	1
CO2	2	0	0	0	0	0	2	0	1	2	1
CO3	2	0	0	0	0	0	2	0	2	3	1
CO4	3	0	0	0	0	0	3	0	3	3	3
CO5	2	0	0	0	0	0	2	0	2	3	3

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS : 28-04-2021 **ACADEMIC COUNCIL: 01-04-2022**

SDG No. & Statement: 9: Industry, Innovation and Infrastructure

SDG Justification:

This course is related to programming, which is considered important for IT applications, practice of data analytics, and digital infrastructure in the industry. So, this course might help for building resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

BUAN3011	DATABASE MANAGEMENT SYSTEMS	L	T	P	S	J	C
		3	0	0	0	0	3
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Each and every organization maintains database related to their business such as employees, customers, products, sales and so on. Database management system is collection of programs that enables to store, modify and extract information from a database. SQL is the de facto language for communication with the database and MS Access is a simple and a popular DBMS package from Microsoft which provides the database features in GUI format.

Course Educational Objectives:

- Understand different concepts in DBMS
- Create database in MS Access
- Write queries in SQL
- Write programs in PL/SQL
- Understand the concept of transaction management in DBMS

UNIT 1 Database approach 7 Hours

Features of database approach, advantages and disadvantages, Components of DBMS, Data Models - Hierarchical, Network, Relational, ER analysis, Attributes and Domains, Integrity Constraints and Keys, Normalization – INF, 2NF, 3NF

UNIT 2 Working with MS Access 7 Hours

Creating Tables, Data Types and Fields properties in MS Access, Creating Relationships, Designing Forms for Data Entry, Queries in MS Access – Simple queries, Cross-tab queries, Reports in MS Access – Simple reports, cross tab reports - using report wizard, using query design

UNIT 3 Working with SQL 7 Hours

DDL statements - Create, Drop, Alter, DML statements, Insert, Select, Delete, Update, Oracle Functions, Join Condition, Set Operators, The Order By Clause

UNIT 4 Working with PL/SQL 7 Hours

Control Structures, PL/SQL Block, Cursors, Procedures, Functions, Triggers

UNIT 5 Query Processing and Optimization 7 Hours

ACID properties, Transaction Processing and Concurrency Control - Database Recovery.

Textbooks:

1. Abraham Silberschatz, Henry F Korth, Database System Concepts, McGraw Hill Education

References:

1. Hoffer Jeffrey, V. Ramesh, Topi Heikki, Modern Database Management, Pearson
2. Andrew Couch, Microsoft Access Plain & Simple

Course Outcomes:

After successful completion of the course the student will be able to:

1. Explain different concepts of DBMS
2. Create database in MS Access
3. Perform queries in SQL
4. Write a PL/SQL program
5. Describe the properties of ACID transactions

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2	0	0	0	0	0	2	0	2	2	2
CO2	2	0	0	0	0	0	2	0	2	2	2
CO3	3	0	0	0	0	0	2	0	2	2	2
CO4	3	0	0	0	0	0	2	0	2	2	2
CO5	2	0	0	0	0	0	2	0	2	2	2

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:
BOS : 28-04-2021 **ACADEMIC COUNCIL: 01-04-2022**

SDG No. & Statement: 4: Quality Education

SDG Justification:
The modules and topics mentioned in this course are designed to ensure all-inclusive and thorough education with equity for all persons and promote learning opportunities at all times.

BUAN3021	BUSINESS ANALYSIS	L	T	P	S	J	C
		3	0	0	0	0	3
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Business Analysis is the process of enabling change in an organization by understanding its needs and recommend solutions to achieve the organization goals. Business Analyst helps in achieving this task by leveraging the technology with business functions and organizational needs.

Course Educational Objectives:

- Understand the competencies of a Business Analyst
- Understand the investigation techniques for requirements analysis
- Use Process modeling tools to define the requirements
- Draw use case diagrams
- Understand the structure of a business case

UNIT 1 Introduction to BA 7 Hours

Concept, Business Analysis maturity model, Role and responsibilities of Business Analyst, Competencies of a business analyst, Project Definition and Scoping: Aspects of project, Defining objectives and scope, Identifying stakeholders, Project phases and deliverables, Project approaches - Waterfall, Agile, Iterative, Incremental

UNIT 2 Elicitation 7 Hours

Investigation techniques - Interviewing and Fact Finding, Gathering Requirements – Requirements engineering, Requirements elicitation, Requirement analysis, Types of requirements – Functional and non-Functional, Documenting requirements

UNIT 3 Process Modeling 7 Hours

Examining business process model, Business Process Model and Notation (BPMN), Process Modeling as requirements definition tool. Data Modeling: Concept, Entity relationship diagrams, Identify and define attributes

UNIT 4 Ensuring Requirements Quality 7 Hours

Development of Use Cases and scenarios, Requirements Quality Criteria, Managing Delivery: Delivering the solution, Delivery lifecycles, Deliverables, Techniques

UNIT 5 Making Business and Financial Case 12 Hours

Business case in project lifecycle, Identifying options, Feasibility study, Structure of business case, Investment appraisal, Presentation of business case, Benefits management and realization.

Textbooks:

1. Cadle James, Eva Malcom, Hindle Keith, Paul Debra, et al., Business Analysis, United Kingdom: BCS, The Chartered Institute for IT

References:

1. Pendse Pradeep Hari (2015), *Business Analysis : Solving Business Problems By Visualizing Effective Processes and It Solutions,* New Delhi : Prentice Hall of India.

2. Paul Mulvey, Kate Mcgoey, Kupe Kupersmith (2013), *Business Analysis for Dummies,* New Delhi : Wiley India.

Course Outcomes:

After successful completion of the course the student will be able to:

1. Identify the responsibilities of a Business Analyst
2. Identify different requirement gathering techniques
3. Describe a requirement in terms of process and ER model
4. Describe a requirement in terms of use case
5. Explain the importance of business case

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	1	0	0	0	0	0	2	1	1	1	1
CO2	1	2	0	0	0	0	2	1	1	1	1
CO3	2	1	0	0	0	0	2	1	2	2	1
CO4	2	0	0	0	0	0	2	1	2	2	1
CO5	2	0	0	0	0	0	2	1	2	2	1

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS : 28-04-2021 **ACADEMIC COUNCIL: 01-04-2022**

SDG No. & Statement: 9: Industry, Innovation and Infrastructure

SDG Justification:

This course is related to understanding a business problem and providing well framed solution. So, this course might help for building resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

BUAN3031	WEB ANALYTICS	L	T	P	S	J	C
		3	0	0	0	0	3
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

The World Wide Web along with social media produces huge amount of data every day. This data may provide lot of insight on not only the user's usage behavior but his/her tastes, preferences and thoughts. Web Analytics is a field in data analytics that will help in understanding user's attitudes and characteristics and help a business in targeting the potential customer.

Course Educational Objectives:

- Understand the concept of web analytics
- Understand clickstream and emerging analytics like social, mobile and video
- Understand the application of web analytics metrics

UNIT 1 Introduction to Web Analytics 7 Hours

Concept of web analytics, Importance and benefits of Web Analytics, Selecting a web analytic tool, Web Metrics – Visits and Visitors, Time on page and Time on site, Bounce Rate, Exit Rate, Conversion rate, Engagement, Attributes of metrics, Strategic elements related to web metrics – diagnosing root cause, leveraging customer reports, macro view of the site's performance

UNIT 2 Clickstream Analysis and KPI's 7 Hours

Understanding the web metrics of a web site, Producing web analytics report, Foundational Analytical strategies – Segmentation, Focus on Customer Behaviour, Different Clickstream Analysis, Web analytics challenges, Actionable outcome KPIs, understanding the conversion rates, measuring macro and micro conversions, quantifying economic value, measuring success for non – economic website

UNIT 3 Leveraging Qualitative Data, Testing and Experimentation 7 Hours

Lab Usability Studies, Usability Alternatives, Surveys, Web-enabled emerging user research options, Testing – A/B Testing, Multivariate Testing, Actionable Testing ideas, Controlled Experiments, Creating and Nurturing a testing culture, Competitive Intelligent Analysis – CI data sources, types and secrets, web traffic analysis, search and keyword analysis

UNIT 4 **Emerging Analytics** **7 Hours**

Social Analytics – Data challenge, content democracy evolution, twitter revolution, analyzing offline customer experiences, analyzing mobile customer experiences, Measuring the success of blogs, Quantifying the impact of Twitter, Analysing performance of videos, Hidden web analytics traps – accuracy or precision, Dealing with data quality, Building action dashboard, Nonline marketing opportunity and multichannel measurement, Behaviour Targeting, Challenges in Online data mining and Predictive Analytics

UNIT 5 **Principles of an Analyst** **7 Hours**

Understanding the context, Comparing KPIs over time, measuring latent conversions, understanding the search analytics, Multitouch Campaign Attribution Analysis, Multichannel Analytics.

Textbooks:

1. Kaushik A., Web Analytics 2.0, The Art of Online Accountability and Science of Customer Centricity, Wiley Publishing, Inc.

References:

1. Clifton B., Advanced Web Metrics with Google Analytics, Wiley Publishing, Inc.
2. Sterne J., Web Metrics: Proven methods for measuring web site success, John Wiley and Sons

Course Outcomes:

After successful completion of the course the student will be able to:

1. Understand the usage of different metrics for web analytics
2. Perform clickstream analysis
3. Perform web analytics
4. Perform Social Analytics
5. Understand the principles of an Analyst

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	2	0	0	0	0	0	2	0	2	2	2
CO2	2	0	0	0	0	0	3	0	3	3	3
CO3	2	0	0	0	0	0	3	0	3	3	3
CO4	2	0	0	0	0	0	3	0	3	3	3
CO5	2	0	0	0	0	0	2	0	2	2	2

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS : 28-04-2021 **ACADEMIC COUNCIL: 01-04-2022**

SDG No. & Statement: 9: Industry, Innovation and Infrastructure

SDG Justification:

This course is related to web metrics, which is enable the businesses to assess the success of their online presence and take necessary actions. So, this course might help for building resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

BUAN3041	BIG DATA ANALYTICS	L	T	P	S	J	C
		4	0	0	0	0	4
Pre-requisite	None						
Co-requisite	None						
Preferable exposure	None						

Course Description:

Big data is a term used to describe a massive amount of structured and unstructured data collected over the years from different sources. Analysis of such data may provide great insights for a business. However, traditional data management functions are not capable for handling such data and requires specialized tool. Hadoop is a popular platform for carrying out big data analytics

Course Educational Objectives:

- To acquaint the students with the concepts of big data
- To provide hands on experience in working with Hadoop

UNIT 1 Introduction to Big Data 7 Hours

Concept, Features of big data, big data challenges, Hadoop and its features, Hadoop Ecosystem, Hadoop Components, Hadoop Architecture, Hadoop Cluster, Hadoop Storage: HDFS

UNIT 2 Hadoop Mapreduce 7 Hours

Concept, YARN components, YARN architecture, YARN mapreduce application execution flow, YARN workflow, Java for Mapreduce programming; Mapreduce examples; Mapreduce for data analytics: analyzing numerical and categorical data sets; Mapreduce for statistical analysis; Hadoop streaming

UNIT 3 Apache PIG 7 Hours

PIG Components & Execution, PIG data types, Data models in PIG, Programming in PIG.

UNIT 4 APACHE HIVE&HBase 7 Hours

Introduction, Architecture and components, data types and data models, HIVE partitioning and bucketing, HIVE tables, HIVE QL: joining tables, dynamic partitioning. Introduction, Architecture and components, Run modes, configuration, data models, HIVE data loading techniques,

UNIT 5 Introduction to Apache Spark 7 Hours

Interactive analysis, RDD programming; Spark SQL, Data sets and DataFrames; Basics of MLib and GraphX

Textbooks:

1. Hadoop: The Definitive Guide, Tom White, 4th Edition, O'Reilly Media

References:

1. Big Data Analytics, Introduction to Hadoop, Spark, and Machine-Learning, By Preeti Saxena and Raj Kamal, McGraw Hill Education India.
2. Big Data and Analytics, 2nd Edition, Seema Acharya and Subhashini Chellapan, Wiley Publications India.
3. Big Data Analytics, 2nd Edition, Radha Shankarmani and M. Vijayalakshmi,Wiley Publications India.
4. Big Data Analytics, 1st Edition, G. Sudha Sadasivam and R. ThiruMahal,Oxford Higher Education.

Course Outcomes:

After successful completion of the course the student will be able to:

1. Understand the concept of big data and the process of big data analytics
2. Write programs in Hadoop Mapreduce
3. Write programs in APACHE PIG
4. Work with APACHE Hive
5. Understand the components in APACHE HBase**.**

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
CO1	3	0	0	0	0	0	3	0	3	3	3
CO2	3	0	0	0	0	0	3	0	3	3	3
CO3	3	0	0	0	0	0	3	0	3	3	3
CO4	3	0	0	0	0	0	3	0	3	3	3
CO5	3	0	0	0	0	0	3	0	3	3	3

Note: 1 - Low Correlation 2 - Medium Correlation 3 - High Correlation

APPROVED IN:

BOS : 28-04-2021 **ACADEMIC COUNCIL: 01-04-2022**

SDG No. & Statement: 9: Industry, Innovation and Infrastructure

SDG Justification:

This course is related to programming, which is considered important for IT applications, practice of data analytics, and digital infrastructure in the industry. So, this course might help for building resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.