PGDM - BUSINESS ANALYTICS

Sr. No.	Semester I	Credits	Hours
1	Accounting for Managers	4	40
2	Marketing Management	4	40
3	Leading & Managing Organization	4	40
4	Managerial Economics	2	20
5	Enterprise Systems Management	2	20
6	Decision Sciences	4	40
7	Lifestyle Management	2	20
8	Technology Based Business Transformation	2	20
9	Introduction to Operations Management	2	20
10	Introduction to MS Excel & Advanced Methods	4	40
11	Managerial Communication – 1	2	20
12	Verbal Skills & Quantitative Analysis – 1	2	20
13	Entrepreneurship	2	20
14	Career Management 1	4	40
	TOTAL	**40**	**400**
Sr. No.	**Semester II**	**Credits**	**Hours**
1	Business Data Base	2	20
2	Optimization Techniques	4	40
3	Research Process and Analytics	4	40
4	Analytics for Marketing & Sales	2	20
5	Selling Skills	2	20
6	Analytics in Banking Services	2	20
7	Talent Analytics	2	20
8	Digital Analytics	2	20
9	Leadership Lab	2	20
10	Analytical Tools	2	20
11	NGO Internship	2	20
12	Managerial Communication -2	2	20
13	Advance Excel	2	20
14	Verbal Skills & Quantitative Analysis -2	2	20
15	Selling Skills	2	20
16	Career Management -2	2	20
17	Introduction to Machine Learning	4	40
18	Capstone Project Phase-I	2	20
	SUB TOTAL	**40**	**400**
	Industry Internship Project	**8**	**80**

Sr. No.	Semester III	Credits	Hours
1	Strategic Management	2	20
2	Business Ethics and Corporate Governance	2	20
3	Deep Learning and Neural Network	2	20
4	Analytic Modelling with R	4	40
5	Supply Chain Analytics	2	20
6	Risk Analytics	2	20
7	Machine Learning and Business Applications	4	40
8	Comprehensive Review Module	2	20
9	Placement Readiness Module	4	40
10	Corporate Transition Module	4	40
11	Capstone Project Phase – II	2	20
	TOTAL	**30**	**300**
Sr. No.	**Semester IV**	**Credits**	**Hours**
1	Capstone Project – Final	4	40
2	Artificial Intelligence	2	20
3	Career Management	-	-
	TOTAL	**6**	**60**
	GRAND TOTAL	**124**	**1240**

Course Code : **0207300300**

Course Title : **Accounting for Managers**

Credit : **4**

Duration : **40 hrs.**

Course Faculty :

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
CO1	**Explain** accounting principles, standards, and basic cost concepts which are required for maintaining business accounting records.	**L2 Understand**	3	**Internal Assessment**: Assignment End term - Theory
CO2	**Apply** accounting principles and standards for preparation of Financial Statements.	**L3 Apply**	9	**Internal Assessment**: Class test, Assignment **End term**: Case study
CO3	**Calculate** Costs and Budgets to determine profit	**L 4 Analyze**	6	**Internal Assessment**: Class test, Assignment **End term**: Theory & Numerical
CO4	**Compute** the financial statements of the companies to enable users for decision making purpose	**L 4 Analyze**	12	**Internal Assessment**: Project **End term**: Case Study,
CO5	**Assess** the financial statements of companies to foster analytical and critical thinking abilities.	**L 5 Evaluate**	10	**Internal Assessment**: Assignment, Class test, **End term** -Case study

Mapping with CO-PO

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / Pos	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	2	-	2	-
CO2	3	3	-	2	-
CO3	2	3	-	-	-
CO4	3	3	-	2	1
CO5	2	3	2	2	2
CO	2.6	2.8	2	2	1.5

Session Plan

Session No.	Hours	Topic	Course Outcome (CO)	Cognition	Evaluation Tools
1	**2**	**Introduction - Accounting Principles and Concepts**			
(i)	1.0	Introduction – Accounting Principles, Accounting Standards & IFRS	**CO1 - Explain** accounting principles, standards & IFRS	**L 2 Understand**	Internal Assessment: Assignment End term - Theory
(ii)	1.0	Cost Accounting concepts	**CO1- Explain** basic cost concepts	**L 2 Understand**	Internal Assessment: Assignment End term - Theory

2	**3**	**Accounting for Depreciation**			
(i)	1.0	Introduction, importance, and methods of Depreciation	**CO1- Explain** Accounting Principles and standards -Depreciation	**L 2 Understand**	Internal Assessment: Class Test
(ii)	2.0	Application of SLM Method of Depreciation	**CO2 - Apply** Accounting Principles and Standards -Depreciation	**L 3 Apply**	Internal Assessment: Class Test
3	**5.5**	**Preparation of Financial Statements of a Sole Proprietor: Trading A/c, Profit and Loss Account and Balance Sheet**			
(i)	1.5	Introduction of Financial Statements of a Sole Proprietor	**CO2 - Apply** Accounting Principle and Standards for the preparation of Financial Statements	**L 3 Apply**	Internal Assessment: Class Test
(ii)	2	Preparation of Financial Statements of a Sole Proprietor: Trading & Profit & Loss A/c	**CO2 - Apply** Accounting Principle and Standards for the preparation of Financial Statements	**L 3 Apply**	Internal Assessment: Class Test
(iii)	2	Preparation of Financial Statements of a Sole Proprietor: Balance Sheet	**CO2 - Apply** Accounting Principle and Standards for the preparation of Financial Statements	**L 3 Apply**	Internal Assessment: Class Test
4	**6.5**	**Preparation of Financial Statements of Companies by applying the Revised Schedule III of the**			

		Companies Act, 2013: Statement of Profit and Loss, Balance Sheet			
(i)	1.5	Introduction of Financial Statements of Companies by applying the Revised Schedule III of the Companies Act, 2013	**CO2 - Apply** Accounting Principle and Standards for the preparation of Financial Statements of companies	**L 3 Apply**	Internal Evaluation Assessment: Assignment End term: Case study
(ii)	2.5	Preparation of Financial Statements of Companies -Statement of Profit and Loss	**CO4 - Compute** the financial statements of the companies	**L 4 Analyze**	Internal Evaluation: Assignment End term -Case study
(iii)	2.5	Preparation of Financial Statements of Companies -Balance Sheet	**CO4 - Compute** the financial statements of the companies	**L 4 Analyze**	Internal Evaluation: Assignment End term -Case Study
5	**7**	**Preparation of Cash Flow Statement**			
(v)	1.5	Introduction of Cash Flow Statement	**CO4 - Compute** the Cash Flow Statement of the companies	**L 4 Analyze**	Internal Assessment: Assignment End term- Case Study
(v)	5.5	Preparation of Cash Flow Statement	**CO4 - Compute** the Cash Flow Statement of the companies	**L 4 Analyze**	Internal Assessment: Assignment End term- Case Study
6	**10**	**Tools and Techniques of Financial Statement Analysis: Comparative Statements, Common Size Statement, Trend Analysis, and Ratio Analysis**			
(i)	2	Tools and Techniques	**CO5 - Assess**	**L 5**	Internal

		of Financial Statement Analysis: Comparative Statements,	the financial statements of companies	**Evaluate**	Assessment: Project End term - Case Study
(ii)	2	Common Size Statement and Trend Analysis,	**CO5 - Assess** the financial statements of companies	**L 5 Evaluate**	Internal Assessment: Project End term - Case Study
(iii)	4	Ratio Analysis	**CO5 - Assess** the financial statements of companies	**L 5 Evaluate**	Internal Assessment: Project End term - Case Study
(iv)	2	Analysis and assessment of Annual Reports of Listed Companies (different Sectors)	**CO5 - Assess** the financial statements of companies	**L 5 Evaluate**	Internal Assessment: Project End term - Case Study
7	**6**	**Preparation of Cost Sheet & Budgets by using the relevant cost accounting concepts**			
(i)	3	Preparation of Cost Sheet	**CO3 - Calculate** Cost Accounting concepts for the preparation of Cost Sheet	**L 4 Analyze**	Internal Assessment: Class Test End term Theory & Numerical
(ii)	3	Budgets and budgetary control	**CO3 - Calculate** Cost Accounting concepts for the preparation of Budgets	**L 4 Analyze**	Internal Assessment: Assignment End term Theory & Numerical

Pedagogy

1. Lecture
2. Case Study

3. Live Projects
4. Numerical

Evaluation: -

Internal Assessment-40 %

External assessment- 60 %

Total- 100 %

Parameters of Internal Assessment:

- Attendance
- Class Participation
- Class Test
- Project
- Assignment

Assessment Mapping:

Parameters	Cos / Marks	CO1	CO2	CO3	CO4	CO5
Internal	**40**	**10.00%**	**35.00%**	**10.00%**	**22.50%**	**22.50%**
Class Test	10	0.00%	100.00%	0.00%	0.00%	0.00%
Project	5	0.00%	0.00%	0.00%	0.00%	100.00%
Assignment	5	0.00%	0.00%	0.00%	100.00%	0.00%
Attendance	10	20.00%	20.00%	20.00%	20.00%	20.00%
Class Participation	10	20.00%	20.00%	20.00%	20.00%	20.00%
End Term	**60**	**16.67%**	**16.67%**	**16.67%**	**16.67%**	**33.33%**
Total	**100**	**14.00%**	**24.00%**	**14.00%**	**19.00%**	**29.00%**

Textbook:

1. Accounting for Managers-Dr. CA Geetanjali Pinto, Prof. Uma Ghosh, Prof. Dhaval Bhatt, Dr. CA Pinky Agarwal, Dr Rajshree Yalgi – Himalaya Publishing House, First Edition 2021

Reference Books:

1. Financial Accounting for Management - D.D. Harsolekar, Dr. CA Pinky Agarwal, Taxmann Publication Pvt Ltd. First Edition 2022
2. Accounting and Finance for Non-Finance - Jai Kumar Batra, Sage, 1/e, 2019.
3. Financial Accounting for Management – N. Ramachandran & Ram Kumar Kakani,McGraw Hill Education, 4/e, 2018.
4. Essentials of Financial Accounting – Ashish K. Bhattacharyya, PHI, 4/e, 2017
5. Accounting for Management - Dhanesh K. Khatri, McGraw Hill Education Pvt. Ltd. 1/e, 2015
6. Financial Accounting – Principles & Practices - Prof. Jawahar Lal & Dr. Seema Srivastava, Practices S. Chand, 3/e, 2014.

7. Accounting for Management – Dr. N.P. Srinivasan & Dr. M. Sakthivel Murugan, S.Chand, Revised Edition 2019.
8. A Textbook of Accounting for Management - Maheshwari & Maheshwari, VikasPublication 3/e, 2012
9. Accounting for Management - Dr. Jawahar Lal, Himalaya Publishing House, 6th edition, 2010
10. Accounting for Management - M N Arora, Himalaya Publishing House, 1st Edition,2010

E-Books:

1. Accounting for Management – Dr. N.P. Srinivasan & Dr. M. Sakthivel Murugan, S.Chand, Revised Edition 2019, eBook.
2. Accounting for Management - S. Ramanathan, Oxford University Press, 1/e, 2019, eBook.
3. A Textbook of Accounting for Management - S N Maheshwari, Sharad K Maheshwari,
Vikas Publishing House, 4/e, 2018, e-Book.
4. Accounting for Management - Lal, Jawahar., Himalaya Pub. House., 2019, eBook.

Semester : I
Course Title : Marketing Management
No of Credits : 4
Contact Hours : 40 hrs

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
CO1	Explain the basics of Marketing, concepts, theories, principles for organizational, customer and societal value	L2: Understand	10	End Term- case study, short answers
CO2	Apply the Value creation and delivery concepts in the context of competitive environment to benefit the stakeholders	L3: Apply	10	Internal- assignment, class test End Term- Case study, short answers
CO3	Examine the competitive environment and integrate the marketing strategies for better marketing decisions	L4: Analyse	9	Internal- Case study, assignment End Term- short answers
CO4	Assess the potential market segments to target and position effectively for profitable business opportunities	L5: Evaluate	7	Internal- Class test, case study discussion End Term- case study, short answers
CO5	Apply marketing mix strategies for value creation to all the stakeholders	L3: Apply	4	Internal-detailed presentation of all a brand launch with all the concepts embedded End Term- Case study, short answers

Mapping CO with PO

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

CO Code	PO1	PO2	PO3	PO4	PO5
CO 1	**3**	**2**	**0**	**0**	**0**
CO 2	**3**	**2**	**2**	**3**	**2**
CO 3	**3**	**3**	**2**	**0**	**0**
CO 4	**3**	**3**	**0**	**3**	**0**
CO 5	**3**	**3**	**2**	**3**	**2**
CO	**3.0**	**2.6**	**2.0**	**3.0**	**2.0**

Session plan

Sr. No	Hrs	Units	Cos	Cognition	Evaluation Tools
1	**10**	**Introduction to Marketing**			
(i)	10	Introduction – demand states, Sales Vs Marketing, types of marketing, customer satisfaction, loyalty and Value	**CO1** - Explain the basics of Marketing, concepts, theories, principles for organizational, customer and societal value	**L2: Understand**	End term: Case study/short answers
2	**10**	**Strategic Marketing**			
(i)	**10**	Strategic Marketing planning, competition analysis, environment scanning, core competence and competitive advantage	**CO2** – Apply the Value creation and delivery concepts in the context of competitive environment to benefit the stakeholders	**L3: Apply**	Internal Evaluation: Assignment, class test End term: Case study/short answers
3	**9**	**Marketing mix and competition**			
(i)	9	STP, consumer behavior analysis, introducing marketing mix, product strategies	**CO3** - Examine the competitive environment and integrate the marketing strategies	**L4: Analyse**	Internal Evaluation: Case study Analysis, Assignment

			for better marketing decisions		End term: Short answers
4	**7**	**Marketing mix (contd)**			
(i)	**7**	Pricing, marketing communication, distribution channels, retailing	**CO4-** Assess the potential market segments to target and position effectively for profitable business opportunities	**L5: Evaluate**	Internal Evaluation: Class test, Case study (critical assessment) End term: Case study Short answers
5	**4**	**Applied Marketing strategies for value creation**			
(i)	**4**	Project – embedding the major marketing concepts	**CO5** – Apply marketing mix strategies for value creation to all the stakeholders	**L3 Apply**	Internal Evaluation: A detailed presentation on a new brand creation, covering all the major marketing concepts supported by a report End term: Case study/short answers

Pedagogy

1. Lecture
2. Case Studies
3. Presentation and assignments
4. Articles reading

Evaluation

Internal	40%
External	60%
Total	**100%**

Parameters of Internal Assessment:

- Attendance
- Class Participation
- Class Test
- Case study discussion
- Assignments
- Projects

Assessment Mapping

Parameter	Marks	CO 1	CO 2	CO 3	CO 4	CO 5
Internal	40		20%	26%	24%	30%
Attendance	10	20%	20%	20%	20%	20%
Class Participation	10	20%	20%	20%	20%	20%
Class Test	5	-	40%	-	60%	-
Case study discussion	5	-	-	60%	40%	-
Assignments	5	-	50%	50%	-	-
Projects	5	-	30%	30%	20%	20%
End Term	**60**	**20%**	**15%**	**30%**	**20%**	**15%**

Textbook:

Book Title	Name of Author	Publisher	Edition No.	Year
Marketing Management	Philip Kotler & Levin Lane Keller	Pearson	15th	2015

Reference Book:

Book Title	Name of Author	Publisher	Edition No.	Year
Marketing Management	Rajan Saxena	McGraw Hill	6th	2019
Marketing Management – Indian context with global perspective	V S Ramaswamy & NamaKumari	McGraw Hill	5th	2017

E-Books:

Book Title	Name of Author	Publisher	LinL	Year
Marketing Management with Indian cases	Philip Kotler & Levin Lane Keller	Pearson	https://1lib.in/booL/5285475/1e8c03	2017
Strategic Marketing Management: planning, implementation and control	Richard MS Wilson, Colin Gilligan	Butterworth-Heinemann	https://1lib.in/booL/701127/32ede3	2005

Course Title : Leading and Managing Organization
Semester : I
Credit : 4
Duration : 40 Hrs

Course Outcome	Description	Cognition	Hours	Evaluation Tools
CO1	Explain management concepts at workplace for better performance in the organisation.	L2 Understand	5.0	Internal Evaluation: Assignment & Class Test & Theory Question in End term exam
CO2	Interpret contemporary HR practices for better workplace productivity.	L3 Apply	7.5	Internal Evaluation: Class Test, Question in end term exam
CO3	Correlate HR systems and individual behaviour for building up the strong culture	L4 Analyse	5.5	Internal Evaluation: Assignment, End term exam
CO4	Examine individual and team behavior for effective people management	L4 Analyse	10.0	Internal Evaluation: Question in End term exam, Assignments
CO5	Asset management functions including human resource practices for improving holistic organization performance	L5 Evaluate	12.0	Internal Evaluation: Project, Class test Question in End term exam.

Mapping with CO-PO
1 – Low, 2 – Medium, 3 – High, 0 – Low

COs / Pos	PO 1	PO 2	PO 3	PO 4	PO5
CO1	3	2	2	1	-
CO2	2	3	2	2	-
CO3	2	3	2	1	2
CO4	3	3	2	2	3
CO5	2	3	3	2	3
CO EQ	2.4	2.8	2.2	1.6	2.5

Session Plan

Sr.	Hour	Topic	COs	Cognition	Evaluation

No	s				tools
1	**5**	**Introduction to Management Concepts**			
1.1	2	Importance of Management, Functions of Managers, Introduction to Human Resource Management, Introduction to Organizational Behaviour.	**CO 1** Explain management concepts at workplace for better performance in the organisation.	L2: Understand	Internal Evaluation: Project, Class test Question in End term exam.
1.2	1	Skills & Roles of Managers,	**CO1** Explain management concepts at workplace for better performance in the organisation.	L2: Understand	Internal Evaluation: Project, Class test Question in End term exam.
1.3	2	Evolution of Management Thoughts, New & Old Economy	**CO1** Explain management concepts at workplace for better performance in the organisation.	L2 : Understand	Internal Evaluation: Project, Class test Question in End term exam.
2	**2**	**Planning**			
2	2	Definition, Need, importance Planning, levels of Planning & Strategic Planning Process.	**CO2** Interpret contemporary HR practices for better workplace productivity.	L3: Apply	Internal Evaluation: Project, Class test Question in End term exam.
3	**2**	**Structuring**			
3	**2**	Definition, Need, Importance of Structuring. Types of Organisational structure. structuring in Organizations	**CO2** Interpret contemporary HR practices for better workplace	L3: Apply	Internal Evaluation: Project, Class test Question in End term exam.

			productivity.		
4	**2**	**Organizing and controlling**			
4.1	**1**	Definition of Organizing, Scope, need and importance Organizing Function, Elements of Organizing,	**CO2** Interpret contemporary HR practices for better workplace productivity.	L3: Apply	Internal Evaluation: Project, Class test Question in End term exam.
4.2	**1**	Managerial Control Process, Types of Control, Control Techniques. Application of Controlling Techniques	**CO2** Interpret contemporary HR practices for better workplace productivity.	L3: Apply	Internal Evaluation: Project, Class test Question in End term exam.
5	**1**	**Leadership**			
5.1	**1**	Definition, Importance, Leadership Traits,	**CO2** Interpret contemporary HR practices for better workplace productivity.	L3: Apply	Internal Evaluation: Project, Class test Question in End term exam.
5.2	**1**	Styles of leadership Leading for High performance Team	**CO3** Correlate HR systems and individual behaviour for building up the strong culture	L4: Analyse	Internal Evaluation: Project, Class test Question in End term exam.
6		**Human Resource Management**			
6.1	1	Introduction, Functions, need of HRM.	**CO2** Interpret contemporary HR practices for better workplace productivity.	L3: Apply	Internal Evaluation: Project, Class test Question in End term exam.
6.2	1	Skills and competencies of an hr Manager. Role of Line manager as HR Manager	**CO3** Correlate HR systems and individual	L4: Analyse	Internal Evaluation: Project, Class test Question

			behaviour for building up the strong culture		in End term exam.
7	**2**	**Recruitment and Selection.**			
7.1	**1**	Definition, Need and Importance. Recruitment process, Selection Process.	**CO2** Interpret contemporary HR practices for better workplace productivity.	L3: Apply	Internal Evaluation: Project, Class test Question in End term exam.
7.2	**1**	Definition of Interview and Interview Techniques	**CO2** Interpret contemporary HR practices for better workplace productivity.	L3: Apply	Internal Evaluation: Project, Class test Question in End term exam.
8	**2**	**Performance Management**			
8.1	**1**	Definition of Performance Management, Need and importance.	**CO2** Interpret contemporary HR practices for better workplace productivity.	L3: Apply	Internal Evaluation: Project, Class test Question in End term exam.
8.2	**1**	Definition of KRA and KPI. Methods of PMS. Modern methods of Appraisal.	**CO2** Interpret contemporary HR practices for better workplace productivity	L3: Apply	Internal Evaluation: Project, Class test Question in End term exam.
9	**2**	**Compensation and Benefits**			
9.1	**1**	Definition, need for and importance of compensation. Types of compensation.	**CO2** Interpret contemporary HR practices for better workplace productivity	L3: Apply	Internal Evaluation: Project, Class test Question in End term exam.
9.2	**1**	Components of employee compensation and CTC	CO5 Asset management functions	L4: Analyse	Internal Evaluation: Project, Class test Question

			including human resource practices for improving holistic organization performance		in End term exam.
10	**4**	**Introduction to OB and Personality**			
10.1	**2**	Definition of OB, Definition of personality, types of personality,	**CO4** Examine individual and team behavior for effective people management	L4: Analyse	Internal Evaluation: Project, Class test Question in End term exam.
10.2	**2**	Attributes that shape up the personality & Personal Effectiveness, Personality Attributes, Personality Testing	**CO3** Correlate HR systems and individual behaviour for building up the strong culture	L4: Analyse	Internal Evaluation: Project, Class test Question in End term exam.
11	**5**	**Perception and Individual Decision Making**			
11.1	**2**	Overview of Perception, Attribution Theory, Perception and Individual Decision Making	**CO3** Correlate HR systems and individual behaviour for building up the strong culture	L4: Analyse	Internal Evaluation: Project, Class test Question in End term exam.
11.2	**2**	Attitude, Values and Job Satisfaction, Managerial implication & application in industry	**CO4** Examine individual and team behavior for effective people management	L4: Analyse	Internal Evaluation: Project, Class test Question in End term exam.
11.3	1	Defining Attitude, Components of Attitude, Attitude & Behaviour Relationship, Major Job Attitudes	**CO4** Examine individual and team behavior for effective people	L4: Analyse	Internal Evaluation: Project, Class test Question in End term exam.

			management		
12	**4**	**Motivation and Motivation theories**			
12.1	**2**	Motivation Concepts and Application: Defining Motivation, Theories of Motivation, Maslow, Mc Gregor, McClelland, Herzberg	**CO3** Correlate HR systems and individual behaviour for building up the strong culture	L4: Analyse	Internal Evaluation: Project, Class test Question in End term exam.
12.2	**2**	Theories of Motivation, Maslow, Mc Gregor, McClelland, Herzberg	**CO3** Correlate HR systems and individual behaviour for building up the strong culture	L4: Analyse	Internal Evaluation: Project, Class test Question in End term exam.
13	**4**	**Group and Group Dynamics**			
13.1	**3**	Foundations of Group Behaviour, Group Development Process, Understanding Work Team Effectiveness, Building Interpersonal Relationship, Transactional analysis	**CO4** Examine individual and team behavior for effective people management	L4: Analyse	Internal Evaluation: Project, Class test Question in End term exam.
13.2	**1**	Power & Politics, Bases of Power, Implications for Managers	**CO4** Examine individual and team behavior for effective people management	L4: Analyse	Internal Evaluation: Project, Class test Question in End term exam.
14	**4**	**Conflict and Stress Management**			
14.1	**1**	Definition of conflict, reasons of conflict , Conflict management techniques	**CO4** Examine individual and team behavior for effective people management	L4: Analyse	Internal Evaluation: Project, Class test Question in End term exam.
14.2	**3**	Definition of Stress, Reasons of Stress, stress management techniques, Role of Organisation in managing employee stress, wellness at workplace and its importance.	**CO5** Asset management functions including	L5 Evaluate	Internal Evaluation: Project, Class test Question in End term

			human resource practices for improving holistic organization performance		exam.

Pedagogy
1. Lecture
2. Case Study
3. News/Article Analysis
4. Live Activity/Exercise
5. Videos

Parameters of Internal Assessment:

1. Project
2. Assignment
3. Test
4. Class Participation
5. Attendance

Evaluation:	
Internal Assessment	40%
External Assessment	60 %
Total	100%

Assessment Mapping

Parameter	Marks	CO 1	CO 2	CO 3	CO 4	CO 5
Internal	40	21%	21%	21%	21%	15%
Attendance	10	20%	20%	20%	20%	20%
Class Participation	10	20%	20%	20%	20%	20%
Class Test	5	50%	50%	0	0	0%
Assignments	5	0	0	50%	50%	0
Projects	10	20%	20%	20%	20%	20%
End Term	**60**	10%	20%	20%	25%	25%
Total	**100**	15%	21%	21%	24%	21%

Textbook:

1. Management Theory and Practice (Text & Cases) - Dr. P Subba Rao & Venkatram Tej Kumar, Himalaya Publis hing House, 2nd Edition, 2014

Reference Books:

1. New Era of Management - Richard L. Daft, CENGAGE Publisher, 2nd edition, Reprint- 2012
2. Principles of Management - P C Tripathi & P N Reddy, Tata McGraw Hill, 5th Edition, 2012
3. Essential of Management - An International, Innovation, & Leadership Perspective - Harold Koontz & Heinz Weihrich, Tata McGraw Hill, 10th Edition, 2015.
4. Management & Organizational Behaviour - Ramesh B Rudani, Tata Mac Graw Hill, 1st Edition, 2011
5. Human Resource Management – Gary Dessler & Biju Varkkey, Pearson, 14th Edition, 2016
6. Human Resource Management – Text & Cases - Sharon Pande & Swapnalekha Basak, Vikas Publishing House Pvt. Ltd., 2nd Edition, 2015
7. Human Resource Management - Seema Sanghi, Vikas Publishing House Pvt. Ltd., 1st Edition, 2014.
8. Human Resource Management – A Modern Approach - A. Din Pangotra, Asian Books Pvt. Ltd., with Practical Up-Gradation 1st Edition, 2013
9. Organizational Behaviour – Text & Cases - Kavita Singh, Vikas Publishing House Pvt. Ltd., 3rd Edition, 2015.
10. Organizational Behaviour – A Modern Approach - Arun Kumar & N Meenakshi, Vikas Publishing House Pvt. Ltd., 1st Edition, 1st Reprint 2014.

E Books:

http://open.lib.umn.edu/principlesmanagement/

http://www.freebookcentre.net/business-books-download/Introduction-to-Principles-of-Management.html

https://bookboon.com/en/management-organisation-ebooks

https://learnmgt.weebly.com/ebooks.html

https://open.umn.edu/opentextbooks/BookDetail.aspx?bookId=30

http://bookboon.com/en/organisational-behaviour-ebook

https://www.free-ebooks.net/ebook/Management-and-Organization-Behavior

http://bba12.weebly.com/uploads/9/4/2/8/9428277/organizational_behavior_15e_-stephen_p_robbins__timothy_a_judge_pdf_qwerty.pdf

http://www.saylor.org/books

https://bookboon.com/en/hrm-ebooks

https://www.ciphr.com/features/seven-best-hr-ebooks/

http://www.e-booksdirectory.com/listing.php?category=439

Course Title : Managerial Economics

Semester : I

Credit : 2

Duration : 20 hrs

Course Outcome	Description	Cognition	Hours	Evaluation Tools
After the completion, of the course, students should be able to				
CO1	Understand the fundamental theories and concepts of managerial economics.	L2: Understand	3.75	Internal Evaluation: Class Test & Assignment End term: Theory Question
CO2	Apply the key concepts and techniques of microeconomics to recognize and solve business problems faced by an organization.	L3: Apply	3.75	Internal Evaluation: Class Test & Assignment End term: Theory Question
CO3	Examine the relationship between production function and cost for managerial decision-making.	L4: Analyze	2.5	Internal Evaluation: Class Test & Assignment End term: Numerical/Theory Question
CO4	Analyze the impact of macroeconomic factors on business decision-making.	L4: Analyze	6.25	Internal Evaluation: Class Test & Assignment End term: Theory Question
CO5	Evaluate the intent and outcomes of monetary and fiscal policies to address the economic issues.	L5: Evaluate	3.75	Internal Evaluation: Class Test & Assignment End term: Theory Question

Mapping with CO-PO

1 – Low, 2 – Medium, 3 – High, 0 – Low

COs	PO1	PO2	PO3	PO4	PO5
CO-1	3	2	1	3	1
CO-2	3	3	2	3	2
CO-3	3	3	2	3	2
CO-4	3	3	2	3	2
CO-5	3	3	2	3	2
CO	3	2.8	1.8	3	1.8
CO EQ	3	3	2	3	2

Session Plan:

Session	Hours	Topic	COs	Cognition	Evaluation Tools
1	**1.25**	**The Nature and Scope of Managerial Economics and Theory of the Firm**			
	1.25	● What is Economics and Managerial Economics? - Scope of Managerial Economics. ● Economic Principles: Concept of Scarcity, Opportunity Cost, PPC, Margin, Increment & Discounting Principle. ● Objective of the Firm: Maximization Theory of Profit, Sales Revenue, Growth, Managerial Utility Function & the Wealth of Stockholders under risk and uncertainty.	CO-1 Understand the fundamental theories and concepts of managerial economics.	L2: Understand	Class Test Assignment End term Theory Question
2 & 3	**2.50**	**Demand, Supply, and Market Equilibrium**			
	0.50	● Definition of Demand - Demand Function - Law of Demand ● Law of Supply - Supply Function, Schedule	CO-1 Understand the fundamental theories and concepts of managerial economics.	L2: Understand	Class Test Assignment End term Theory Question
	2.00	● Demand and Various Types of Goods - Demand Schedule and Demand Curve - Determinants of Demand - Changes in Quantity Demanded Vs. Changes in Demand - Individual Demand and Market Demand. ● Supply Schedule and Supply Curve - Determinants of Supply - Change in Quantity Supplied Vs. Change in Supply - Individual Supply and Market Supply. ● Market Equilibrium - Effects of Changes and Simultaneous Changes in Demand and Supply.	CO-2 Apply the key concepts and techniques of microeconomics to recognize and solve business problems faced by an organization.	L3: Apply	Class Test Assignment End term Theory Question
4	**1.25**	**Elasticity of Demand**			
	1.25	● Price Elasticity of Demand -Degrees of Elasticity - Point and Arc Elasticity - Price Elasticity	CO-2 Apply the key concepts and techniques of microeconomics	L3: Apply	Class Test Assignment End term Theory Question

		and Total Revenue. ● Cross-Price Elasticity ● Income Elasticity	to recognize and solve business problems faced by an organization.		
5 & 6	**2.50**	**Supply-Side Economics: Theory of Production and Cost**			
	2.50	● Definition of Production - Short Run and Long Run Function of Production - Classification of Factors of Production - Law of Diminishing Marginal Returns. ● Concepts of Revenue: Total Revenue (TR) and Marginal Revenue (MR). ● Cost Concepts - Costs Curve in the Short Run and Long Run - Returns to Scale – Break-Even Analysis - Margin of Safety - Total Economic Cost - Economic Profit.	CO-3 Examine the relationship between production function and cost for managerial decision-making.	L4: Analyze	Class Test Assignment End term Numerical/Theory Question
7	**1.25**	**Market Structure: Introduction and Basic Features**			
	1.25	Market Morphology - Perfect Competition, Monopoly, Monopolistic Competition, and Oligopoly: Market Features – Existence in Real World(examples).	CO-1 Understand the fundamental theories and concepts of managerial economics.	L2: Understand	Class Test Assignment End term Theory Question
8 & 9	**2.50**	**Nature and Scope of Macroeconomics and National Income: Concept and Measurement**			
	1.25	● Definition and Nature of Macroeconomics - Circular Flow: Two, Three and Four Sector Economy - Aggregate Demand & Supply - Consumption & Investment.	CO-1 Understand the fundamental theories and concepts of managerial economics.	L2: Understand	Class Test Assignment End term Theory Question
	1.25	● National Income: GDP/GNP, Nominal, Real and Deflator - GDP at Factor Cost & Market Price - Methods of Measuring National Income – NDP, National Income (NI) and Per-Capita Income (PCI) - Personal Income (PI) and Disposable Income (DI) - National Income Estimates Based on New	CO-4 Analyze the impact of macroeconomic factors on business decision-making.	L4: Analyze	Class Test Assignment End term Theory Question

		Series (Base Year 2011-12) – GVA.			
10 & 11	**2.50**	**Inflation: Theories and Control Measures**			
	2.50	1. Inflation, Deflation, Disinflation, and Stagflation - Methods of Measuring Inflation: WPI/PPI, CPI and GDP Deflator - Kinds of Inflation - Degrees or Types of Inflation. 2. Modern Theories of Inflation - Demand-Pull and Cost-Push Inflation - Inflation and Money Supply - Inflation and Interest Rates - Effects of Inflation - Philips Curve - Policy Measures to Control Inflation.	CO-4 Analyze the impact of macroeconomic factors on business decision-making.	L4: Analyze	Class Test Assignment End term Theory Question
12 & 13	**2.50**	**Monetary Policy**			
	2.50	● Evolution of Money – Functions of Money - The Value of Money - The Quantity Theory of Money - The Neutrality of Money. ● Demand for Money and Supply of Money - Money Creation by the Commercial Bank - Banks and the Money Supply - The Money Multiplier - Deposit Creation and Deposit Multiplier - Credit Multiplier. ● Monetary Policy: Meaning, Scope, and Quantitative and Qualitative Instruments.	CO-5 Evaluate the intent and outcomes of monetary and fiscal policies to address the economic issues.	L5: Evaluate	Class Test Assignment End term Theory Question
14	**1.25**	**Fiscal Policy and Union Budget**			
	1.25	5. Meaning and Objectives of Fiscal Policy - Fiscal Instruments & Target Variables - Fiscal Deficit - Union Budget 2022-2023.	CO-5 Evaluate the intent and outcomes of monetary and fiscal policies to address the economic issues.	L5: Evaluate	Class Test Assignment End term Theory Question
15 & 16	**2.50**	**Balance of Payment**			
	2.50	Meaning, Purpose, and Structure of Balance of Payments: Basic Principles - Balance of Trade	CO-4 Analyze the impact of macroeconomic	L4: Analyze	Class Test Assignment End term Theory Question

		(BOT) - Assessment of BOP Disequilibrium - Capital Account Convertibility - Special Drawing Rights. Calculating Exchange Rate Changes - Appreciation, Depreciation, Devaluation, and Revaluation - Exchange Rate in Free Market and Fixed Exchange Rate System - The Real Exchange Rate: NEER and REER - Purchasing Power Parity.	factors on business decision-making.		

Pedagogy	
1. Lecture	
2. Case Study	
3. News/Article Analysis	
4. Live Activity/Exercise	
5. Videos	
Evaluation:	
Internal	40%
External	60%
Total	100%

Evaluation:
Internal Assessment
External Assessment
Total

External Assessment:
End Term Examination

Parameters of Internal Assessment:

1. Class Test
2. Assignment
3. Class Participation
4. Attendance

Assessment Mapping:

Parameter	Marks	CO-1	CO-2	CO-3	CO-4	CO-5

Internal	20	17.5%	20%	20%	22.5%	20%
Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Class Test	5	10%	20%	20%	30%	20%
Assignment	5	20%	20%	20%	20%	20%
End Term	30	10%	20%	20%	30%	20%

Textbook:	
Managerial Economics (ME)	D. N. Dwivedi, 9th Edition, Vikas Publishing House Pvt Ltd, 2022.

Reference Books:	
Managerial Economics (MEG)	Geetika, Piyali Ghosh and Purba Roy Choudhury, 3rd Edition, McGraw Hill Education Pvt Ltd, 2017.
Managerial Economics Principles and Worldwide Applications (MEPWA)	Dominick Salvatore and Siddhartha K. Rastogi, 8th edition, Oxford University Press, 2016.
Managerial Economics (MEK)	Paul G. Keat. Philip K.Y. Young and Sreejata Banerjee, 7th Edition, Pearson Education, New Delhi, 2017.
Managerial Economics (MET)	Christopher R. Thomas, S. Charles Maurice, and Sumit Sarkar, 9th Edition, Tata McGraw Hill Education Pvt Ltd, New Delhi, 2011.
Macroeconomics Policy Environment (MPE)	Shyamal Roy. 2nd Edition, McGraw Hill Education Pvt Ltd, New Delhi, 2016.
Principles of Economics	N. Gregory Mankiw, 7th Edition, Cengage Learning India Pvt Ltd, 2015.
Economics	Lipsey and Chrystal,13th International Edition, Oxford University Press,2015.
Macroeconomics	Dornbusch Rudiger, Fischer, Stanley, Startz, 12th Edition, McGraw Hill Education, 2018.

eBooks:	
Managerial Economics (ME)	D. N. Dwivedi, 8th Edition, Vikas Publishing House Pvt Ltd, 2015.
Managerial Economics	Suma Damodaran,2nd edition, Oxford University Press, 2010.
Principles of Economics	N. Gregory Mankiw, 7th Edition, Cengage Learning India Pvt Ltd, New Delhi 2015.
Managerial Economics	R. Panneerselvam, P. Sivasankaran & P. Senthilkumar, 1st Edition Cengage Learning India Pvt Ltd, 2018.
Managerial Economics Principles and Worldwide Applications (MEPWA)	Dominick Salvatore and Siddhartha K. Rastogi, 9th edition, Oxford University Press, 2020.
Microeconomics: Markets, Methods, and Models	Douglas Curtis and Ian Irvine, LYRYX Service Course Solution,2014. https://laecon1.lyryx.com/textbooks/OPEN_CURTIS_MIC_1/marketing/CurtisIrvine-Microeconomics-2017A.pdf
Simplified Principles of Microeconomics	Hazbo Skoko,1st Edition, Bookboon.com,2015. https://bookboon.com/en/simplified-principles-of-microeconomics-ebook#download
Principles of Microeconomics for AP courses	Timothy Taylor, Openstax College, Rice University, 2015. https://d3bxy9euw4e147.cloudfront.net/oscms-prodcms/media/documents/PrinciplesofMicroeconomicsforAPCourses-OP.pdf
Principles of Economics	Timothy Taylor, Openstax College, Rice University, 2014. https://d3bxy9euw4e147.cloudfront.net/oscms-prodcms/media/documents/PrinciplesofEconomics-OP.pdf
Essentials of Macroeconomics	Peter Jochumzen, 1st Edition, Bookboon.com, 2010. https://bookboon.com/en/macroeconimics-uk-ebook
Practical Guide to Contemporary Economics	Yuri Yevdokimov, Bookboon.com, 2012. https://bookboon.com/en/practical-guide-to-contemporary-economics-ebook

Course Title: **Enterprise Systems Management**
Semester: **I**
Credit: **2**
Duration: **20 hours**

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
CO1	Understand various information systems concepts and e-commerce strategies to improve managerial decision-making.	**L2: Understand**	**2**	Internal Quiz, Test End Term- Theory
CO2	Apply various information systems strategies and database concepts to upgrade decision-making practices.	**L3: Apply**	**6**	Internal- Practical End Term- Theory
CO3	Apply various e-commerce strategies to achieve innovative digital markets.	**L3: Apply**	**2**	Internal- Test, Practical End Term- Theory
CO4	Analyse enterprise systems strategies to gauge their impact on business decisions.	**L4: Analyse**	**3**	Internal- Test, Assignment End Term- Theory
CO5	Assess the impact of futuristic and challenging trends in enterprise systems.	**L5: Evaluate**	**3**	Internal- Assignment End Term- Theory

Mapping with CO-PO

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No Alignment

COs / Pos	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	2	2	2	-
CO2	3	3	3	-	1
CO3	3	3	3	-	1
CO4	3	2	3	3	1
CO5	3	2	3	3	2
CO	**3**	**2.6**	**3**	**1.6**	**1.25**

Session Plan

Sr. No	Hours	Units	COs	Cognition	Evaluation Tools
		Introduction to ESM			
1	2	● Introduction to Enterprise Systems Management ● Introduction to database concepts ● Introduction to e-commerce concepts and strategies	CO1: Understand various information systems concepts and e-commerce strategies to improve managerial decision-making.	L2: Understand	Internal Quiz, Test End Term- Theory
		ERP Module - 1			
2	3	1. ERP Modules - An insight into TPS, MIS, DSS, ESS, and their applications 2. ERP, SCM, KMS, and CRM applications 3. ERP System Configuration and Integration 4. ERP implementation challenges 5. SCM implementation challenges 6. SCM Types 7. CRM implementation challenges	CO2: Apply various information systems strategies and database concepts to upgrade decision-making practices.	L3: Apply	Internal- Practical End Term- Theory
		ERP Module - 2			
3	3	● Database Management Systems ● Structured Query Language Practical ● Business Intelligence ● Business Analytics ● Big Data Analytics ● Difference between Business Intelligence, Business Analytics, and Big Data Analytics	CO2: Apply various information systems strategies and database concepts to upgrade decision-making practices.	L3: Apply	Internal- Practical End Term- Theory
		ERP Module - 2			

4	3	(1) ERP, SCM, and CRM -the best fit for the chosen industry. Employee Table, Product Table, and Supplier Table in MS Access. E-Commerce Strategies as per Changing Business Trends.	CO3: Apply various e-commerce strategies to achieve innovative digital markets.	L3: Apply	Internal- Test, Practical End Term- Theory
		ERP Module - 1			
5	1	ERP, SCM, and CRM Project Design & Planning Process, Success factors of a good ERP, SCM, and CRM. How to leverage ERP, SCM, and CRM systems to enhance and improve better decision-making in organizations.	CO4: Analyse enterprise systems strategies to gauge their impact on business decisions.	L4: Analyse	Internal- Test, Assignment End Term- Theory
6	1	1. How do DBMS, Business Intelligence, Business Analytics & Big Data Analytics support Decision Making? 2. Structured Query Language Analysis	CO4: Analyse enterprise systems strategies to gauge their impact on business decisions.	L4: Analyse	Internal- Test, Assignment End Term- Theory
		E-commerce			
7	1	• E-Commerce • Unique features of e-commerce, Assess digital markets, and digital goods strategies. • How has e-commerce transformed marketing?	CO4: Analyse enterprise systems strategies to gauge their impact on business decisions.	L4: Analyse	Internal- Test, Assignment End Term- Theory
		E-commerce			

8	2	• How has e-commerce transformed marketing? • How has e-commerce affected B2B transactions? • What is the role of m-commerce in business and what are the most important m-commerce applications? • What issues must be addressed when building an e-commerce presence? • Types of E-Commerce • E-Commerce Payment Systems	CO 5: Assess the impact of futuristic and challenging trends in enterprise systems.	L5: Evaluate.	Internal- Assignment End Term- Theory

Pedagogy

1. Lecture
2. Case Studies
3. Presentation and assignments
4. Projects

Evaluation

Internal 40%
External 60%
Total **100%**

Parameters of Internal Assessment:

1. Attendance
2. Class Participation
3. Class Test
4. Class Activity
5. Assignments
6. Projects

Assessment Mapping

Parameter	Marks	CO 1	CO 2	CO 3	CO 4	CO 5
Internal	40	15%	18%	22%	24%	21%
Attendance	10	20%	20%	20%	20%	20%
Class Participation	10	20%	20%	20%	20%	20%
Class Test	10	30%	30%	15%	15%	10%
Class Activity	5	10%	20%	30%	20%	20%
Assignments	5	-	20%	20%	30%	30%
Projects	10	-	-	30%	40%	30%

End Term	**60**			**30%**	**40%**	**30%**

Textbook:

Book Title	Name of Author	Publisher	Edition No.	Year
Management Information Systems -Managing the digital firm-	Kenneth C. Laudon & Jane P. Laudon	Pearson	16th	2022

Reference Books:

Book Title	Name of Author	Publisher	Edition No.	Year
Management Information Systems	James A O'Brien, George M Marakas & Ramesh Behl	Tata McGraw Hill	12th	**2018**
Enterprise Resource Planning - Demystified	Alexis Leon	Tata McGraw Hill	2nd	**2016**
Management Information system	James A O'brien	Tata McGraw Hill	5th	**2016**
Enterprise Resource Planning	Mary Sumner	Pearson		**2015**
Management Information Systems	Davis and Olson	Tata McGraw Hill	2nd	**2017**
Management Information Systems	Effy oz	Cengage Learning	6th	**2019**

E-Books:

Book Title	Name of Author	Publisher	Link	Year
MIS			http://www.uotechnology.edu.iq/dep-cs/mypdf/subjects/4is/4mis.pdf	
MIS			http://www.academia.edu/5275161/Management_Information_Systems_12th_Edition_	
MIS			https://drive.google.com/file/d/1Arp1vggiOgxjksUrIScOBIt7b5Q8vvNF/view	
Introduction to MIS			https://drive.google.com/file/d/1DQ48mt_EbzBRRCX_Zyzmtz6SOhdsoagL/view	

MIS – Basic Concepts			https://drive.google.com/file/d/1xhxT8ReGYpmlfApE8lBXij0cCGH7Ji9F/view	
MIS			https://www.sigc.edu/department/mba/studymet/ManagmentInformationSystem.pdf	
MIS			http://dinus.ac.id/repository/docs/ajar/Kenneth_C.Laudon,Jane_P_.Laudon_-_Management_Information_Sysrem_13th_Edition_.pdf	
MIS			http://www.pearsonmiddleeastawe.com/pdfs/SAMPLE-MIS.pdf	
MIS			Managing the digital firm - http://iefb.weebly.com/uploads/1/4/2/4/14240576/libri_per_msi.pdf	
ERP - Making it happen			http://www.labeee.ufsc.br/~luis/egcec/livros/ERP/ERP%20-%20Making%20It%20Happen.pdf	
ERP - Global opportunities and challenges			http://www.csbdu.in/csbdu-old/pdf/Enterprise_Resource_Planning.pdf	
Thinking about ERP -			https://www.syspro.com/dl/EB/SYSPRO-Thinking-About-ERP-ALL-EB.pdf	
Open ERP			http://brochures.sisalp.fr/openerp-book-v6.pdf	
Business Analysis	Steven P.Blais		Best Practices for Success	

.

Semester : **I**

Course Title : **Decision Sciences**

No of Credits : **4**

Contact Hours : **40 hrs**

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
CO1	Understand the various statistical concepts used in Decision Science	L2: Understand	7.0	Internal Quiz, Test End Term- Theory
CO2	Illustrate the use of statistical concepts to solve business problems	L3: Apply	7.5	Internal- Assignments, project work, Viva End Term- Sums
CO3	Analyze the statistical information for business decision making	L4: Analyze	9.0	Internal- Assignment Viva project work End Term- Sums
CO4	Assess the tools & techniques used in decision making for its appropriateness	L5: Evaluate	5.5	Internal Project work End term- Sums
CO5	Develop suitable statistical models for business decision making	L6: Create	3.0	Internal Project work End term sums

Mapping with CO-PO

1 – Low, 2 – Medium, 3 – High, 0 – Low

COs /	PO 1	PO 2	PO 3	PO 4	PO 5

Pos					
CO1	3	2	-	-	-
CO2	2	3	-	1	-
CO3	3	3	2	1	2
CO4	3	3	2	2	2
CO5	3	3	2	2	2
CO	2.8	2.8	2	1.5	2

Session Plan

Sr. No	Hrs	Topic	COs	Cognition	Evaluation Tools
1	**1**	**Introduction to Decision Sciences**			
(i)	1	Meaning and Importance of Decision Science	CO1: Understand the various statistical concepts used in Decision Science	L2: Understand	Internal - Test
2	**2.0**	**Representation of Data**			
(i)	2	Frequency Distribution Charts, tables and diagrams.	CO2: Illustrate the use of statistical concepts to solve business problems	L3: Apply	Internal- Practical, project work
3	**3.5**	**Measures of Central Tendency**			
(i)	.5	Various concepts related to measures of central tendency	CO1: Understand the various statistical concepts used in Decision Science	L2: Understand	Internal- Class Test, Viva, Project work
(ii)	3.0	Practical application on various datasets	CO2: Illustrate the use of statistical concepts to solve business problems	L3: Apply	Internal -Practical, Class test
4	**2.5**	**Measures of Dispersion**			
(i)	.5	Various concepts related with measures of dispersion	CO1: Understand the various statistical concepts used in Decision Science	L2 : Understand	Internal- Test, Viva, Practical

(ii)	2	Sums related to dispersion	CO3: Analyze the statistical information for business decision making	L4: Analyse	Internal - Project work, Test
5	**1.5**	**Measures of Symmetry**			
(i)	.5	Various concepts related to skewness, moments and Kurtosis	CO1 : Understand the various statistical concepts used in Decision Science	L2 : Understand	Internal- Test, Viva
(ii)	1	Sums related to Skewness and Kurtosis	CO3 : Analyze the statistical information for business decision making	L4: Analyse	Internal - Project work
6	**3.5**	**Probability & its Distributions**			
(i)	1	The various concepts related with probability	CO1: Understand the various statistical concepts used in Decision Science	L2: Understand	Internal- Viva Test, End Term- Theory
(ii)	1	Discrete and Continuous Frequency Distribution: Calculation of Binomial, Poisson and Normal Distribution	CO2 : Illustrate the use of statistical concepts to solve business problems	L3: Apply	Internal- Test, Practical End Term- Sums
(iii)	1.5	Discrete and Continuous Frequency Distribution: Application of Binomial, Poisson and Normal Distribution.	CO3 : Analyze the statistical information for business decision making	L4: Analyse	Internal- Viva, Test, End Term- Theory
7	**1.0**	**Theory of estimation**			
(i)	.5	Various concepts related with theory of estimation	CO1: Understand the various statistical concepts used in Decision Science	L2: Understand	Internal- Test, Viva Practical End Term- Sums, Theory
(ii)	.5	Calculation of point and interval estimate	CO2 : Illustrate the use of statistical concepts to solve business problems	L3: Apply	Internal- Test, Practical End Term- Sums
8	**3.5**	**Hypothesis Testing**			
(i)	1	T test & F Test : Concepts	CO3 : Analyze the statistical information for business decision making	L4 : Analyse	Internal- Project work End term -Practical
(ii)	2.5	T test & F test : Application	CO4 : Assess the tools & techniques used in decision making for	L5 : Evaluate	Internal- Project work

			its appropriateness		End term -Practical
9	**1**	**Chi-Square test**			
(i)	1	Introduction to Chi-square	CO1 : Understand the various statistical concepts used in Decision Science	L2: Understand	Internal- Viva Test, End Term- Theory
10	**2**	**Analysis of Variance**			
(i)	1	Concept of ANOVA	CO2 : Illustrate the use of statistical concepts to solve business problems	L3: Apply	Internal- Project work End term -Practical
(ii)	1	Practical application using software	CO4 : Assess the tools & techniques used in decision making for its appropriateness	L5 : Evaluate	Internal- Project work End term -Practical
11	**4.0**	**Measures of Association**			
(i)	.5	Understand the various concepts related measures of association	CO1: Understand the various statistical concepts used in Decision Science	L2: Understand	Internal -Viva, Test
(ii)	2.5	Concept: Karl Pearson, Spearman coefficient of correlation	CO3 : Analyze the statistical information for business decision making	L3:Apply	Internal- Project work End term -Practical
(iii)	1	Practical application using software : Karl Pearson, Spearman coefficient of correlation	CO4 : Assess the tools & techniques used in decision making for its appropriateness	L4 : Analyze	Internal- Project work End term -Practical
12	**5**	**Regression Analysis**			
(i)	1	Understand the various concepts related with regression analysis	CO1: Understand the various statistical concepts used in Decision Science	L2: Understand	Internal -Viva End term -Practical question
(ii)	1	Least Square Principle, Drawing the regression line	CO4: Assess the tools & techniques used in decision making for its appropriateness.	L5 : Evaluate	Internal- Project work End term -Practical
(iii)	2	Relationships among the correlation coefficient, Coefficient of Determination,	CO5: Develop suitable statistical	L6: Create	Internal- Project

		Standard Error of Estimate.	models for business decision making		work End term -Practical
(iv)	1	Multiple Regression Analysis	CO5: Develop suitable statistical models for business decision making	L6: Create	Internal Project work End term- Sums
13	**1.5**	**Time Series and forecasting**			
(i)	.5	Introduction and components of time series	CO1: Understand the various statistical concepts used in Decision Science	L2: Understand	Internal -Viva End term -Theory question
(ii)	1	Forecasting Techniques : Moving Average & Weighted Moving Average	CO3 : Analyze the statistical information for business decision making	L4: Analyse	Internal- Project work End term -Practical

Pedagogy

6. Lecture
7. Case Studies
8. Presentation and assignments

Evaluation

Internal	40%
External	60%
Total	**100%**

Parameters of Internal Assessment:

- Attendance
- Class Participation
- Class Test

4. Assignment
5. Project

Assessment Mapping

Parameter	Marks	CO1	CO2	CO3	CO4	CO5
Internal	40	17.5%	25.0%	25.0%	15.0%	17.5%
Attendance	10	20.0%	20.0%	20.0%	20.0%	20.0%
Class Participation	10	20.0%	20.0%	20.0%	20.0%	20.0%
Class Test	10	30.0%	40.0%	30.0%	0.0%	0.0%
Assignments	5	0.0%	40.0%	60.0%	0.0%	0.0%
Projects	5	0.0%	0.0%	0.0%	40.0%	60.0%

End Term	**60**	**16.7%**	**16.7%**	**25.0%**	**25.0%**	**16.7%**
Total	**100**	**17.0%**	**20.0%**	**25.0%**	**21.0%**	**17.0%**

Text Book:

Statistical techniques in Business & Economics- Lind, Marchal & Wathen, Mc Graw Hill Education, 16th Edition, 2017.

Reference Books:

Book Title	**Name of the Author**	**Publisher**	**Edition no.**	**Edition year**
Business Statistics	Ken Black	Wiley India,	7th Edition	Reprint 2012
Fundamentals of Business Statistics.	J.K Sharma	Vikas Publishing house Pvt ltd, New Delhi	2nd Edition	2014
Statistics for Management Prentice	Levin and Rubin	Pearson	7th Edition	2011
Business Statistics in practice	Bruce L. Bowerman,	Tata Mc Graw Hill, Pearson.	7th Edition,	2014
Applied Statistical Methods	S. P. Gupta	S Chand	41st Edition	2011
Business Statistics	S C Gupta	Himalaya Publishing	6th Edition	2013

E-Books details:

Sr. No.	**Name of the Book**	**Author's Name**	**Publication**	**link**	**Edition**
1)	Introductory Statistics: Concepts, Models and Applications	David. W. Stockburger	Atomic dog publishing. com	http://www.pdftitles.com/book/13223/introductory-statistics-concepts-models-and-applications	1996
2)	Business Statistics	Bajpai Naval	Pearson India	https://www.pinterest.com/pin/760404718307803413/	2008

3)	Fundamentals of Business Statistics	Sharma J.K	Pearson India	https://docs.google.com/document/d/12xXI9UF2FEMuJ_uN6J6h7TJ1biiAp2kt1DKlhuo0yvA/edit	2008
4)	Problems & Solutions of Business Statistics	Sharma, J. K.	Pearson India	https://www.amazon.in/Business-Statistics-Problems-Solutions-Sharma-ebook/dp/B00CDIDNAG#reader_B00CDIDNAG	2011
5)	Statistics for Economics, Accounting and business studies	Michael Barrow	Financial Times/ Prentice Hall	https://thenigerianprofessionalaccountant.files.wordpress.com/2013/04/statistics-for-economics-accounting-and-business-studies-4th-ed.pdf	2006
6	Business Statistics	Ken black	Wiley India	https://www.pdfdrive.net/business-statistics-e23260267.html	2010

Semester: I
Course Title: Lifestyle Management
No of Credits: 2
Contact Hours: 20 hrs

Course Outcome

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
CO1	**Explain** Yoga concepts and principles to regulate and discipline lifestyle.	L2: Understand	2.0	Internal, Practical, End Term Theory
CO2	**Apply** the HELM (Heartfulness Enabled Leadership Mastery) concepts for Inner strength and strength building.	L3: Apply	6.0	Internal- Practical
CO3	**Demonstrate** various yoga concept, , Mudras and asanas for energy conservation, Personality development and positive health	L3: Apply	7.0	Internal- Practical
CO4	**Assess** the impact of Pranayama and Meditations in reducing stress.	L5: Evaluate	2.0	Internal- Test, Practical End Term-
CO5	**Evaluate** the Yogic and Lifestyle Management techniques in developing value-based leadership	L5: Evaluate	3.0	Internal- Test, Practical End Term- Test

Mapping CO with PO

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / POs	PO 1	PO 2	PO 3	PO 4	PO 5
CO-1	3	2	-	-	-
CO-2	3	3	2	-	2
CO-3	3	3	2	1	2
CO-4	3	3	2	1	2
CO-5	3	3	3	1	2
CO	3	3	2.23	1	2

Session Plan

-

Session	Hrs	Topic	COs	Cognition	Evaluation Techniques
1	**2 hrs**	**Introduction to LSM** Meaning of Yoga and its importance in higher education. Do's and Don'ts in LSM. Sitting correct for good postures. Simple yogic stretches for whole body. What is Asana? Does Yoga mean only asanas?	**CO1:** Explain Yoga concepts and principles to regulate and discipline lifestyle.	L2: Understand	Internal, Practical, End Term Theory
2	**1 hrs**	**HELM-CONNECT** Where we learn about our peers and our mentors, and we connect with them. We also understand the power of intention and the need for inner guidance_	**CO2:** Apply the HELM (Heartfulness Enabled Leadership Mastery) concepts for Inner strength and strength building.	L3: Apply	Internal- Practical
3	**1 hrs**	**Personality Development Tools** Suryanamaskar simplified in steps. Build your strength. **Guided Meditation 1**: Pranadharana -I Shavasana for relaxation.	**CO3:** Demonstrate various yoga concept, , Mudras and asanas for energy	L3: Apply	Internal- Practical

			conservation, Personality development and positive health		
4	**1 hrs**	**HELM-CORE** Here we move from outer connections to inner and we learn about our inner strengths, skills and values.	**CO2:** Apply the HELM (Heartfulness Enabled Leadership Mastery) concepts for Inner strength and strength building.	L3: Apply	Internal- Practical
5	**1 hrs**	**Yoga for improving Body Language.** Selected standing asanas - explanation, demonstration and practice. **Guided Meditation 3**: Pranadharana -I & II Shavasana for relaxation.	**CO3:** Demonstrate various yoga concept, , Mudras and asanas for energy conservation, Personality development and positive health	L3: Apply	Internal- Practical
6	**1 hrs**	**Yoga for Extra Energy**. Various stretches for loosening. Suryanamaskar Supine Asanas - explanation, demonstration and practice. **Pranayama**- Anuloma Viloma, Bhramari, Ujjai- explanation, demonstration and practice. **Guided Meditation**: Pranadharana I & II Shavasana for relaxation.	**CO3:** Demonstrate various yoga concept, , Mudras and asanas for energy conservation, Personality development and positive health	L3: Apply	Internal- Practical
7	**1 hrs**	**Yoga for Stress Management**. **Pranayama**- Kapalbhati, Sheetali, Seetkari –demonstration, explanation and practice. Reflection Exercise. **Guided Meditation**: Pranadharana I, II & III Shavasana for relaxation.	**CO4: Assess** the impact of Pranayama and Meditations in reducing stress.	L5: Evaluate	Internal- Test, Practical End Term-

8	**1 hrs**	**HELM-Context -** Where we learn about our world and our place in it and try to understand how we can contribute towards the fulfilment of UN Goals for Sustainable Development	**CO2:** Apply the HELM (Heartfulness Enabled Leadership Mastery) concepts for Inner strength and strength building.	L3: Apply	Internal- Practical
9	**1 hrs**	**HELM-Choices -** Role of peer pressure in decision making and how to take the right decision in most situations.	**CO2:** Apply the HELM (Heartfulness Enabled Leadership Mastery) concepts for Inner strength and strength building.	L3: Apply	Internal- Practical
10	**1 hrs**	**Mudra Vighyan- Ancient science for Modern World.** Control Five basic elements for complete health. Explanation, Demonstration and Practice of important mudras. Shavasana for relaxation.	**CO3:** Demonstrate various yoga concept, , Mudras and asanas for energy conservation, Personality development and positive health	L3: Apply	Internal- Practical
11	**1 hrs**	**HELM-Causality -** Where we discuss the cause and effect of our actions.	**CO2:** Apply the HELM (Heartfulness Enabled Leadership Mastery) concepts for Inner strength and strength building.	L3: Apply	Internal- Practical
12	**1 hrs**	**Yoga for Studies & for Creativity** Seven Chakras…Contd. Selected asanas – Explanation, Demonstration and practice. Relaxation.	**CO4: Assess** the impact of Pranayama and Meditations in reducing stress.	L5: Evaluate	Internal- Test, Practical End Term-

13	**1 hrs**	**<u>Concentration building through Yoga.</u>** Various asanas, Meditation Techniques. Jyoti Tratak / Bindu Tratak. Eye exercises	**CO3:** Demonstrate various yoga concept, , Mudras and asanas for energy conservation, Personality development and positive health	L3: Apply	<u>Internal-</u> Practical
14	**1 hrs**	**HELM-Causality -** Where we discuss the various resources available to the participants for deepening their Heartfulness practice	**CO2:** Apply the HELM (Heartfulness Enabled Leadership Mastery) concepts for Inner strength and strength building.	L3: Apply	<u>Internal-</u> Practical
15	2.5 hrs	Revision & Test of Asanas, Pranayama & stress management techniques	**<u>CO5:</u>** Evaluate the Yogic and Lifestyle Management techniques in developing value-based leadership	L5: Evaluate	<u>Internal-</u> Test, Practical <u>End Term-</u> Test
16	2.5 hrs	Revision & Test of Asanas, Pranayama & stress management techniques	**<u>CO5:</u>** Evaluate the Yogic and Lifestyle Management techniques in developing value-based leadership	L5: Evaluate	<u>Internal-</u> Test, Practical <u>End Term-</u> Test

	Pedagogy
1.	Lecture
2.	Practical Demonstration
3.	Actual workout and practice
4.	Live Activity / Exercise

5.	Revisions

Evaluation:

Internal Assessment	40%
External Assessment	60%
Total	100%

Parameters of Internal Assessment:
Classroom participation
Attendance
Class Tests
Class Tests / Assignments

Assessment Mapping

Parameter	Marks	CO 1	CO 2	CO 3	CO 4	CO 5
Internal	20	10%	25%	25%	20%	20%
Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Practical Class Test-1	5	-	-	40%	30%	30%
Practical Class Test-2	5	-	-	40%	30%	30%
End Term	**30**	**25%**	**15%**	**30%**	**20%**	**10%**

Text Books:
Study material will be provided on ERP

Reference Books:

1. Yoga for Health and Peace - Padmashree Sadashiv Nimbalkar, YVN Publication, Mumbai.
2. Pranayama- An Effective Means for Mental Peace - Padmashree Sadashiv Nimbalkar, YVN Publication, Mumbai.
3. Light on Pranayama - Padmavibhushan B.K.S. Iyenger, Harper Collins Publishers, Delhi.

Course Title: Technology Based Business Transformation
Semester: I
Credit: 2
Duration: 20 hours

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
CO1	Identify the latest technological trends affecting digital disruptions across sectors.	**L2: Understand**	**2.5**	Internal Quiz, Test End Term- Theory
CO2	Illustrate the use of latest technologies tools to create value and enhance business opportunities.	**L3: Apply**	**6.5**	Internal- Practical End Term- Theory
CO3	Demonstrate the application of technological innovation in various business domain.	**L3: Apply**	**3.5**	Internal- Test, Practical End Term- Theory
CO4	Contrast the use of latest technological tools & techniques across industry to have in-depth insights.	**L4: Analyse**	**3.5**	Internal- Project End Term- Theory
CO5	Assess the impact of technology innovations to to measure its success and disruptions.	**L5: Evaluate**	**4**	Internal- Project End Term- Theory

Mapping CO with PO

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / Pos	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	2	-	2	-
CO2	3	3	-	2	-
CO3	2	3	-	2	-
CO4	2	3	2	3	2
CO5	2	3	2	3	2
CO	**2.4**	**2.8**	**2.0**	**2.4**	**2.0**

Session Plan

Sr. No	Hours	Units	COs	Cognition	Evaluation Tools
		Introduction to the Latest Technologies			
1	2.5	Introduction to the latest technologies that changing business trends.	CO1: Identify the latest technological trends affecting digital disruptions across sectors.	L2: Understand	Internal Quiz, Test End Term- Theory
		Applications of the latest technologies			
2	2	Understand the Basics of - 3. IOT Concepts, IOT Architecture, IOT Business Models, and Opportunities for IOT 4. Artificial Intelligence and the next wave of artificial intelligence	CO2: Illustrate the use of latest technologies tools to create value and enhance business opportunities	L3: Analyse	Internal Quiz, Test End Term- Theory
3	2.5	Understand the Basics of - 9. Machine Learning and Deep Learning 10. Augmented Reality and Virtual Reality	CO2: Illustrate the use of latest technologies tools to create value and enhance business opportunities	L3: Analyse	Internal Quiz, Test End Term- Theory
4	2	Understand the Basics of - ● Block Chain ● Emerging & Advanced Technologies ● Application program interfaces ● Smart Devices ● Cloud Computing	CO2: Illustrate the use of latest technologies tools to create value and enhance business opportunities	L3: Analyse	Internal Quiz, Test End Term- Theory
5	3.5	Apply various strategies focusing on the	CO3:	L3: Analyse	Internal-

		industry impacts of technological innovation and digitizing Products for Sustainability's Sake Innovation.	Demonstrate the application of technological innovation in various business domain.		Test End Term- Theory
6	3.5	Search and list down various latest Machin Learning, Deep Learning, Augmented Reality, Virtual Reality, and Blockchain technological tools to get in-depth insights and classify them as per the industry.	CO4: Contrast the use of latest technological tools & techniques across industry to have in-depth insights.	L4: Analyse	Internal- Project End Term- Theory
7	4	A Case Study on Blockchain in Manufacturing: "FabRec": A Prototype for Peer-to-Peer Network of Manufacturing Node Case Study: 7 Inspiring Case Studies on VR and AR --"Smart Home with Full Automation" Security-risks-of-cloud-computing	CO5: Assess the impact of technology innovations to to measure its success and disruptions.	L5: Evaluate	Internal- Project End Term- Theory

Pedagogy

- Lecture
- Case Studies
- Presentation and assignments
- Practical & Projects

Evaluation

Internal	40%
External	60%
Total	**100%**

Parameters of Internal Assessment:

- Attendance
- Class Participation

- Class Test
- Project

Assessment Mapping

Parameter	Marks	CO 1	CO 2	CO 3	CO 4	CO 5
Internal	20	18%	20%	18%	20%	25%
Attendance	5	20.0%	20.0%	20.0%	20.0%	20.0%
Class Participation	5	20.0%	20.0%	20.0%	20.0%	20.0%
Class Test	5	30.0%	40.0%	30.0%	0.0%	0.0%
Project	5	0.0%	0.0%	0.0%	40.0%	60.0%
End Term	**30**	**13.3%**	**26.7%**	**20.0%**	**20.0%**	**20.0%**
Total	**50**	**15.0%**	**24.0%**	**19.0%**	**20.0%**	**22.0%**

Reference Books:

Book Title	Name of Author	Publisher	Edition No.	Year
Internet of Things – Architecture and design principles	Raj Kamal	Tata McGraw Hill	12th	**2018**
The Digital Transformation Playbook – Rethink Your Business for the Digital Age	David Rogers	Columbia Business School Publishing	2nd	**2016**
Digital Transformation	Lindsay Herbert	Bloomsbury Publication		2018
Demystifying Digital Transformation: A Practitioner's Companion	Nishith Sharan			2018

E-Books:

Book Title	Link	Year
Technology Trends	https://www.forbes.com/sites/jaysondemers/2017/12/30/7-technology-trends-that-will-dominate-2018/#702d35c857d7	
Technology Trends	http://fortune.com/2017/12/26/4-technology-trends-2018/	
Hottest technologies	https://www.inc.com/yoram-solomon/3-hottest-technologies-that-will-change-your-busin.html	
Technologies will change small business	https://hubworks.com/13-technologies-will-change-small-business.html	
Smart city	https://pages.questexweb.com/rs/294-MQF-056/images/Build_a_Smart_City_FINAL.pdf	
Artificial intelligence	https://courses.csail.mit.edu/6.034f/ai3/rest.pdf	
Artificial intelligence	http://gunkelweb.com/coms493/texts/AI_Dummies.pdf	
Bitcoin and cryptocurrency technologies	https://lopp.net/pdf/princeton_bitcoin_book.pdf	
IOT	https://support.ptc.com/WCMS/files/160474/en/PTC_eBook_Impact_of_the_IoT_on_Manufacturers.p	

Course Title	**:**	**Introduction to Operations Management**
Semester	**:**	**I**
Credits	**:**	**2**
Contact Hours	**:**	**20 Hrs**

Course Outcomes	Description	Cognition	Hours	Evaluation Tool
CO1	Explain the concepts, principles, practices & challenges of operations management for managing business operations.	**L2: Understand**	**5**	Internal- Test, Assignment
CO2	Apply various framework, to New product design & development for value proposition.	**L3: Apply**	**2**	Internal- Test, Case Study, Exercise
CO3	Apply appropriate methods related to the selection of facility location, layout	**L3: Apply**	**5**	Internal- Test, Case Study End Term- Theory
CO4	Analyse the various inventory management tools, capacity planning for better productivity, cost effectiveness and efficiency of the business	**L4: Analyze**	**6**	Internal- Test, Case Study, Numerical
CO5	Evaluate the continuous improvement tools for better quality and decision making.	**L5: Evaluate**	**2**	Internal- Test, Case Study

Mapping with CO-PO

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / Pos	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	1		1	1
CO2	3	3		2	2
CO3	3	3		2	3
CO4	3	3		2	3
CO5	3	3		2	3
CO	**3**	**3**		**2**	**2**

Session Plan

Sr. No.	Hours	Syllabus- Course Contents	Course Outcome (CO)	Cognition	Evaluation Tools
1	3	**Introduction to Operations Management** Operations management of Manufacturing and service sectors, Transformation process, Goods and Services, Types of Production Systems Interface of Operations with other management areas	CO1-Explain the concepts, principles, practices & challenges of operations management for efficiently managing business operations.	L2: Understand	Internal- Test, Assignment
2	1	Role of Operations, in Various Sectors	CO1- Explain the concepts, principles, practices & challenges of operations management for efficiently managing business operations.	L2: Understand	Internal- Test, Assignment
3	1	**Future of Operations**- Circular Economy, Industry 4.0, Product Design	CO1- Explain the concepts, principles, practices & challenges of operations management for efficiently managing business operations.	L2: Understand	Internal- Test, Assignment

4	2	**New Product/Service Development** New product development cycle, reasons for failure of new products, Outsourcing and Offshoring of new product development - over-view	CO2- Apply the various framework, to New product design & development, for continuous successes of the business	L3: Apply	Internal- Test, Case Study, Exercise
5	2.50	**Facility Location** Strategy for new location and various Methods for selecting a site for a factory. Objectives, Various types of plant layout in manufacturing and service industry. Steps for determining layout	CO3- Apply appropriate methods related to the selection of facility location, layout and capacity planning for better productivity, cost effectiveness and increased efficiency of the business	L3: Apply	Internal- Test, Case Study End Term- Theory
6	2.50	**Facility Layout** Objectives, Various types of plant layout in manufacturing and service industry. Steps for determining layout	CO3- Apply appropriate methods related to the selection of facility location, layout and capacity planning for better productivity, cost effectiveness and increased efficiency of the business	L3: Apply	Internal- Test, Case Study
7	3	**Production / Operations Planning & Control** Aggregate planning, Capacity Planning, Material requirement planning, Production / Operation Planning and Control.	CO4-Analyse the various inventory management tools, capacity planning for better productivity, cost effectiveness and efficiency of the business	**L4: Analyze**	Internal- Test, Case Study, Numericals
8	3	**Inventory Management**: inventory types, inventory costs, Importance of inventory control and methods of inventory control. EOQ, ABC Analysis.	CO4-Analyse the various inventory management tools, capacity planning for better productivity, cost effectiveness and efficiency of the	**L4: Analyze**	Internal- Test, Case Study, Numericals

			business		
9	2	**Quality management** Definition of quality and quality control methods, Dimensions of quality, Cost of quality, QC Tools, Six Sigma, ISO	CO 5- Evaluate the continuous improvement tools for better Quality & decisions making.	L5 Evaluate	Internal- Test, Case Study

Pedagogy
1. Lecture
2. Case Study
3. Presentation / Assignment
4. Activity/ Exercise
5. Videos

Evaluation

Internal	40%
External	60%
Total	**100%**

Parameters of Internal Assessment:

Internal Assessment	20Marks
External Assessment / End Term Exam	30Marks
Internal Assessment:	
Attendance	5 Marks
Class Participation	5Marks
Presentation /Project /Assignment	5Marks
Class Test	5 Marks
Total	20Marks

Assessment Mapping

Parameter	Marks	CO 1	CO 2	CO 3	CO 4	CO 5
Internal	20	20%	13%	22%	25%	20%
Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Class Test	5	20%	20%	25%	20%	15%
Assignment / Project / Presentation	5	40%	30%		30%	
End Term	**30**	**20%**	**16%**	**22%**	**22%**	**20%**
Total	**50**	**20%**	**15%**	**22%**	**23%**	**20%**

Textbook:

1) Production and Operations Management - K. Ashwathappa & K. Shridhara Bhat, Himalaya Publications, 2nd Edition, 2008, Reprint 2015

Reference Book:

1) Production and Operations Management - Chase, Ravi Shankar, Jacobs Mc Graw Hill, 14th Edition, 2014, Reprint 2017

2) Operations Management- Theory and Practice - B.Mahadevan, Pearson, 3rd Edition,2015

3) Operations & Supply Management: - S.N. Chary, Mc Graw Hill Education (India) Pvt Ltd 5th Edition, Reprint 2013,

4) Operations Management - William J. Stevenson, Mc Graw Hill, 12th Edition,2017

5) Production and Operations Management - Kanishka Bedi, OXFORD, 3rd Edition, 2013

E-Book:

- Operations Management Roberta Russell and Bernard Taylor
  file:///C:/Users/user1/Downloads/Stevenson%20-%20Operations%20Management%2013th%20Edition%20c2018%20(%20PDFDrive.com%20)%20(1).pdf

- Operations Management Nigel Slack, S Chambers & R Johnston

http://carlbamford.weebly.com/uploads/4/4/1/3/4413567/operations_management_6th_ed.pdf

3) Operations Management Notes by Anna University --

file:///C:/Users/user1/Downloads/UNIT%20-%20I%20INTRODUCTION%20TO%20PRODUCTION%20AND%20OPERATION%20MANAGEMENT%20(%20PDFDrive.com%20).pdf

4) Operations Management -- William Stevenson, Mc - Graw Hill, Edition 12, 2014

http://ebook3000.com/Operations-Management--12th-edition_389046.html

Semester: I
Course Title: Introduction to MS-Excel and Advance Methods
Credit: 4
Duration: 40 hrs.

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
CO1	**Apply** basic excel fundamentals and commands to manage worksheet effectively.	L3: Apply	7.25	Internal Assignment, Test
CO2	**Solve** numerical, text, date, and lookup formula.	L3: Apply	13.0	Internal- Assignment, Test, Practical End Term- Test
CO3	**Analyse** the use of different charts.	L4: Analyse	11.0	Internal- Assignment, Test, Practical End Term- Test
CO4	**Analyse** applications on Google drive, Google forms and effective scheduling using Google Calendar.	L4: Analyse	2.5	Internal- Practical, Test End Term- Test
CO5	**Analyse** different features and formulas on Google Spreadsheet.	L4: Analyse	6.25	Internal- Practical, Test End Term- Test

Mapping CO with PO

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / POs	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	2	3	1	1	1
CO2	2	3	1	1	1
CO3	2	3	1	1	1
CO4	2	3	2	-	2
CO5	2	3	2	1	2
CO	**2.0**	**3.0**	1.4	1.0	**1.4**

Session Plan

Sr. No	Hrs	Units	COs	Cognition	Evaluation Tools
1	**1.5**	**Microsoft Excel Fundamentals**:			
(i)	1.5	☐ Launching Excel ☐ Introduction to the Excel Interface ☐ Customizing the Excel Quick Access Toolbar ☐ Understanding the Structure of an Excel Workbook ☐ Saving an Excel Document ☐ Opening an Existing Excel Document	CO1: Apply basic excel fundamentals and commands to manage worksheet effectively.	L3: Apply	Internal- Assignment, Test, Practical End Term- Test
2	**3.0**	**Microsoft Excel Fundamentals**:			
(i)	3.0	☐ Launching Excel ☐ Introduction to the Excel Interface ☐ Customizing the Excel Quick Access Toolbar ☐ Understanding the Structure of an Excel Workbook ☐ Saving an Excel Document ☐ Opening an Existing Excel Document	CO1: Apply basic excel fundamentals and commands to manage worksheet effectively.	L3: Apply	Internal- Assignment, Test, Practical End Term- Test
3	**3.0**	**Entering and Editing Text and Formulas**			

(i)	3.0	3. Entering Text to Create Spreadsheet Titles 4. Working with Numeric Data in Excel 5. Entering Date Values in Excel 6. Working with Cell References 7. Data Linking within workbooks and worksheets. 8. Creating Basic Formulas in Excel 9. Relative Versus Absolute Cell References in Formulas 10. Consolidate multiple sheets into single sheets.	CO1: Apply basic excel fundamentals and commands to manage worksheet effectively.	L3: Apply	Internal- Assignment, Test, Practical End Term- Test
4	**2.0**	**Working with Basic Excel Functions**			
(i)	2.0	☐ The structure of an Excel Function ☐ Working with the SUM() Function ☐ Working with the MIN() and MAX() Functions ☐ Working with the AVERAGE() Function ☐ Working with the COUNT() Function ☐ Using the AutoSum Command ☐ Using the AutoFill Command to Copy Formulas	CO2: Solve numerical, text, date, and lookup formula.	L3: Apply	Internal- Assignment, Test, Practical End Term- Test,
5	**2.5**	**Study of Basic and Advance filter:**			
(i)	2.5	7. Introduction to Basic filter 8. Advance filter 9. Filter function	CO2: Solve numerical, text, date, and lookup formula.	L3: Apply	Internal- Assignment, Test, Practical End Term- Test
6	**2.0**	**Paste Special Functions and Protection of cells, workbook, and worksheets:**			
(i)	2.0	☐ Paste Special Transpose ☐ Paste Special Values ☐ Paste Special Formula ☐ Paste Special Link ☐ Protection of Cells ☐ Protection of Workbook and Worksheets	CO2: Solve numerical, text, date, and lookup formula.	L3: Apply	Internal- Assignment, Test, Practical End Term- Test
7	**2.0**	**Working with Excel's Lookup Functions**			
(i)	2.0	● Using Excel's VLOOKUP() Function ● Using Excel's HLOOKUP() Function	CO2: Solve numerical, text, date, and lookup formula.	L3: Apply	Internal- Assignment, Test, Practical End Term-

					Test
8	**2.5**	**Transpose and Date Functions**			
(i)	1.0	☐ TRANSPOSE using Paste special ☐ Simple Transpose	CO2: Solve numerical, text, date, and lookup formula.	L3: Apply	Internal- Assignment, Test, Practical End Term- Test
(ii)	1.5	5. DAYS 6. WEEKDAY 7. EOMONTH 8. EDATE 9. WEEKNUM, 10. EMONTH, 11. YEARFRAC	CO2: Solve numerical, text, date, and lookup formula.	L3: Apply	Internal- Assignment, Test, Practical End Term- Test
9	**2.5**	**Text Based Functions and working with Match and Index:**			
(i)	1.5	• Using Excel's LEFT(), RIGHT() and MID() Functions • Using Excel's LEN() Function • Using Excel's SUBSTITUTE(),REPLACE(),TRIM() Function • Using Excel's CONCATENATE() Function • Using Excel's Text functions TEXT SPLIT() TEXT BEFORE() HSTACK() VSTACK() TAKE() DROP() CHOOSECOLS() CHOOSEROWS()	CO2: Solve numerical, text, date, and lookup formula.	L3: Apply	Internal- Assignment, Test, Practical End Term- Test
(ii)	1.0	5. Introduction to Match () 6. Introduction to Index () 7. Combination of Match & Index()	CO2: Solve numerical, text, date, and lookup formula.	L3: Apply	Internal- Assignment, Test, Practical End Term- Test,
10	**4.0**	**Analyse Basic Charts in Excel:**			
(i)	4.0	• Creating an Excel Column Chart • Working with the Excel Chart Ribbon • Adding and Modifying Data on an Excel Chart	CO3: Analyse the use of different charts.	L4: Analyse	Internal- Practical, Test End Term- Test

		• Formatting an Excel Chart • Moving a Chart to another Worksheet			
11	**7.0**	**Analyse different chart and its uses:**			
(i)	3.5	• Candle Chart • Gantt Chart	CO3: Analyse the use of different charts.	L4: Analyse	Internal- Practical, Test End Term- Test
(ii)	3.5	Forecast and Trend Chart Histogram Chart	CO3: Analyse the use of different charts.	L4: Analyse	Internal- Practical, Test End Term- Test
12	**2.5**	**Working with Google Drive, Google Calendar and Google forms**			
(i)	1.0	Google Drive: ● Uploading and downloading files and folders in Google Drive. ● Exploring Shared drive ● Permission Settings	CO4: Analyse applications on Google drive, Google forms and effective scheduling using Google Calendar.	L4: Analyse	Internal- Test
(ii)	2.5	Google forms and Google Calendar: 8. Designing quizzes using google forms and downloading their responses in Google Sheets. 9. Scheduling using Google Calendars and its synchronization using mobile phone	CO4: Analyse applications on Google drive, Google forms and effective scheduling using Google Calendar.	L4: Analyse	Internal- Test
Working with Google Spreadsheets					
13	**1.0**	**Introduction to Functions and Conditional Functions**			
(i)	1.0	Get familiar with Conditional Formatting column/row wise and filter functions with filter views.	CO5: Analyse different features and formulas on Google Spreadsheet.	L4: Analyse	Internal- Test
14	**2.0**	**Nested Conditional Functions**			
(i)	2.0	8. NESTED IF()	CO5: Analyse	L4: Analyse	Internal-

		9. NESTED IF() with AND() NESTED IF() with OR()	different features and formulas on Google Spreadsheet.		Test
15	**2.0**	**Working with TEXT functions**			
(i)	2.0	(2) LEFT() (3) RIGHT() (4) LEN() (5) TRIM() (6) FIND() & SEARCH()	CO5: Analyse different features and formulas on Google Spreadsheet.	L4: Analyse	Internal-Test
16	**1.5**	**Working in a Collaborative environment and protection of worksheet and named ranges**			
(i)	1.5	(7) Learning different sharing techniques (8) Getting familiar with owners' rights (9) Protection of sheets in a collaborative environment Protection of named ranges in spreadsheet	CO5: Analyse different features and formulas on Google Spreadsheet.	L4: Analyse	Internal-Test
17	**1.5**	**Stock Picking and Real Time Translators with GOOGLE FINANCE and GOOGLE TRANSLATE**			
(i)	1.5	❒ Get stock information instantly with GOOGLE FINANCE() ❒ Become a polyglot with GOOGLE TRANSLATE()	CO5: Analyse different features and formulas on Google Spreadsheet.	L4: Analyse	Internal-Test

Pedagogy

11. Lecture
12. Assignments
13. Presentation

Evaluation

Internal 60%
External 40%
Total 100%

Parameters of Internal Assessment:

1. Attendance
2. Class Participation
3. Class Test
4. Project Presentation

Assessment Mapping:

Parameter	Marks	CO 1	CO 2	CO 3	CO 4	CO 5
Internal	40	10%	25%	15%	25%	25%
Attendance	10	20%	20%	20%	20%	20%
Class Participation	10	20%	20%	20%	20%	20%
Class Test	10	15%	15%	30%	20%	10%
Projects	10	5%	70%	10%	10%	10%
End Term	**60**	**10%**	**70%**	**10%**	**5%**	**5%**

Reference Book:

Book Title	Name of Author	Publisher	Edition No.	Year
Excel 2013 Power Programming with VBA	John Walkenbach	Wiley & Sons, Incorporated, John	-	2007
Excel 2016 Power Programming with VBA	Michael Alexander Dick,Kusleika	Wiley	1st	2016

E-Books:

Book Title	Name of Author	Publisher	Link	Year
Microsoft Word 2013™ An Essential Guide (Level 1)	-	reading.ac.uk	http://www.reading.ac.uk/web/files/its/WordEssen13.pdf	2014
Corporate Finance Institute-Excel	-	Corporatefinanceinstitute.com	https://corporatefinanceinstitute.com/resources/ebooks/excel-book-pdf/	2013

Course Title: **Managerial Communication - 1**

Semester: **I**

Credit: **2**

Duration: **20 hrs.**

Course Outcomes	Description	Cognition	Hrs	Evaluation Tools
CO 1	Apply elements of effective public speaking to overcome stage fear.	**L3 - Apply**		Internal Role Play End Term Theory
CO 2	Debate on current affairs to ace debates, movie review and newsroom discussions.	**L4 - Anlayse**		Internal Role Play End Term Theory
CO 3	Apply the techniques of delivering effective presentations to maintain standardization & convey the right message to the audience.	**L3 - Apply**		Internal Role Play End Term Theory
CO 4	Develop strategies to create compelling and persuasive stories.	**L4 - Analyse**		Internal Role Play End Term Theory
CO5	Develop effective written communication skills to ace personal and professional interactions.	**L4 - Analyse**		Internal Assignment End Term Theory

Mapping with CO-PO

1 – Low, 2 – Medium, 3 – High, 0 – Low

COs / Pos	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	-	-	1	-
CO2	-	3	-	3	2
CO3	2	2	1	3	-
CO4	2	2	2	2	-
CO5	2	2	2	2	2

CO	2.3	2.3	1.7	2.2	2.0

Session Plan

Sess. No.	Hrs	Topic	COs	Cognition	Evaluation Tools
		Presentation Skills			
1	1.25	Roadmap	CO1: Apply elements of effective public speaking to overcome stage fear.	L3: Apply	Internal Role Play End Term Theory
2- 3	2.50	Presentation Skills	CO3: Apply the techniques of delivering effective presentations to maintain standardization & convey the right message to the audience.	L3: Apply	Internal Role Play End Term Theory
		Persuasive Story Telling			
4-5	2.5	Story Telling	CO4: Develop strategies to create compelling and persuasive stories.	**L4 - Analyse**	Internal Role Play End Term Theory
		Business Writing Skills			
6-7	2.5	Email Writing for Workplace	CO5: Develop effective written communication skills to ace personal and professional interactions.	L4 : Analyse	Internal Assignment End Term Theory
8	1	Report WritingThe Speaking Circle	CO5 - Develop effective written communication skills to ace personal and professional interactions.	L5: Evluate	Internal Assignment End Term Theory
		The Speaking Circle			
9	1.25	Elements of Public Speaking	CO1: Apply elements of effective public speaking to overcome stage fear.	L3: Apply	Internal Role Play End Term Theory
10-16		Debate Movie Review Ad Spoof News Room	CO2: Debate on current affairs to ace debates, movie review and news room discussions.	**L4 - Anlayse**	Internal Role Play End Term Theory

Pedagogy
1. Lecture
2. Case Study
3. News/Article Analysis
4. Live Activity/Exercise
5. Videos

Evaluation:	
Internal	40%
External	60%
Total	100%

Parameters of Internal Assessment:

Written Assessment - Email

Attendance

Class Participation

Assessment Mapping

Parameter	Marks	CO 1	CO 2	CO 3	CO 4	CO 5
Internal	20	15%	18%	22%	24%	21%
Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Role Play	5	20%	20%	20%	20%	
Assignment	5	-	-	-	-	100%
End Term	**30**	**10%**	**20%**	**20%**	**20%**	**30%**

Textbooks/Reference Books:

Business Communication (Connecting at Work) Hory Sankar Mukerjee 1st Edition (Oxford)

Course Title : Verbal Skills and Quantitative Analysis - 1

Semester : I

Credit : 2

Duration : 20 hours

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
CO1	**Understand** the grammar rules to solve parts of speech questions.	**L2 -Understand**	**2**	Internal Quiz End Term Practical
CO2	**Apply** the principles of probability combined with permutation and combination to determine event dynamics.	**L3 -Apply**	**3**	Internal Quiz End Term Practical
CO3	**Apply** deduction techniques to solve reading comprehension and vocabulary questions.	**L3 - Apply**	**3**	Internal Quiz End Term Practical
CO4	**Apply** different tricks and techniques to solve mathematical problems.	**L3 - Apply**	**9**	Internal Test End Term Practical
CO5	**Analyze** the problems to decipher codes, patterns, directions, and relationships.	**L4 - Analyse**	**3**	Internal Test End Term Practical

Mapping with CO-PO

1 – Low, 2 – Medium, 3 – High, 0 – Low

CO Code	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	1	-	-	-
CO2	3	3	-	1	-
CO3	2	3	-	1	-
CO4	2	3	1	1	2
CO5	2	3	1	1	2
CO	**2.4**	**2.6**	**1.0**	**1.0**	**2.0**

Session Plan

Session	Hours	Topics	COs	Cognition	Evaluation Tool
		Verbal Skills			
1-2	2.5	Grammer Basics	CO1: Understand the grammar rules to solve parts of speech questions.	L1: Understand	Internal Quiz End Term Practical
3	1.25	Reading Comprehension	CO3: Apply deduction techniques to solve reading comprehension and vocabulary questions.	L3: Apply	Internal Quiz End Term Practical
4	1.25	Vocabulary (Deductive approach)	CO3: Apply deduction techniques to solve reading comprehension and vocabulary questions.	L3: Apply	Internal Quiz End Term Practical
		Quantitative Aptitude			
5-6	2.5	**Numbers**: Basics, Surds, and Indices, Factors and Multiples, Divisibility, LCM, HCM, BODMAS, PEMDAS, Cyclicity, Unit Digit, Remainders, recurring decimals and fractions	CO4: Apply different tricks and techniques to solve mathematical problems.	L3: Apply	Internal Test End Term Practical
7-8	2.5	**Equations**: Linear and Quadratic equations basics, Problems based on ages, averages, ratios, and proportions	CO4: Apply different tricks and techniques to solve mathematical problems.	L3: Apply	Internal Test End Term Practical
9	1.25	**Percentages**: Reciprocals, conversion of percentage to fraction and vice versa, change in percentage, By and to concept	CO4: Apply different tricks and techniques to solve mathematical problems.	L3: Apply	Internal Test End Term Practical
10-11	2.5	**Profit and Loss**: Cost Price, Selling Price,	CO4: Apply different tricks	L3: Apply	Internal Test

		Profit, Loss, Marked Price, Discounts, Successive discounts	and techniques to solve mathematical problems.		End Term Practical
12	1.25	**Simple Interest, Compound Interest**: when interest is compounded annually, semi-annually, quarterly and monthly, amount, installments	CO4: Apply different tricks and techniques to solve mathematical problems.	L3: Apply	Internal Test End Term Practical
13	1.25	**Permutation and Combination**: Factorial, arrangement, and selections with repetition and without repetition	CO2: Apply the principles of probability combined with permutation and combination to determine event dynamics.	L2: Understand	Internal Test End Term Practical
14	1.25	**Probability:** Coins, Dice, and Cards, Basic Problems, Conditional Probability	CO2: Apply the principles of probability combined with permutation and combination to determine event dynamics.	L3: Apply	Internal Test End Term Practical
		Logical Reasoning			
15	1.25	**Blood Relations, Direction, Coding-Decoding**: Basic Concepts and tricks	CO5: Analyze the problems to decipher codes, patterns, directions, and relationships.	L4: Analyze	Internal Test End Term Practical
16	1.25	**Number Series, and Analogies**: Basic Concepts and tricks. Internal Assessment	CO5: Analyze the problems to decipher codes, patterns, directions and relationships.	L4: Analyze	Internal Test End Term Practical

Pedagogy	
1. Lecture	
2. Practice exercises	
Evaluation:	
Internal	40%
External	60%
Total	100%

Parameters of Internal Assessment:

1. Class Test
2. Class Participation
3. Attendance

Assessment Mapping

Internal	**20**	**15.0%**	**20.0%**	**20.0%**	**22.5%**	**22.5%**
Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	30%	20%	20%	10%	20%
Quiz	5	20%	40%	40%	-	-
Class Test	5				50%	50%
End Term	**30**	**20 %**	**20%**	**20%**	**20%**	**20%**
Total	**50**	**18%**	**20%**	**20%**	**21%**	**21%**

Reference Book:
R.S. Agarwal - First Edition: 1989
Uma Maheshwari- GACP - First Edition: 2017
For verbal ability, study material would be provided by the respective faculty

Course Title : Entrepreneurship
Semester : I
No. of Credit : 2
Duration : 20 hours

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
CO1	**Understand** basic Entrepreneurship concepts to learn the process of entrepreneurship	L2: Understand	2.5	Internal Quiz, End Term- Theory
CO2	**Apply** basic entrepreneur tools for generating new business ideas.	L3: Apply	5	Internal- Assignment End Term- Theory
CO3	**Analyze** tools, techniques, and frameworks for starting a business venture.	L4: Analyze	7.5	Internal- Quiz, End Term Theory
CO4	**Evaluate** the business idea and its feasibility for creating a business model.	L5: Evaluate	2.5	Internal- Group Presentation End Term- Theory
CO5	**Create** the business model & MVP to start own business.	L6: Create	2.5	Internal- Group Presentation End Term- Theory

Mapping CO with PO

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / Pos	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	**3**	**2-**	**2**	**2**	**-**
CO2	**2**	**3**	**3**	**2**	**-**
CO3	**1**	**3**	**3**	**3**	**2**
CO4	**1**	**3**	**3**	**2**	**2**
CO5	2	3	**3**	3	2
CO	**1.8**	**2.8**	**2.8**	**2.4**	**2**

Session Plan

Sr. No	Hrs	Units	COs	Topics Mapped with CO	Evaluation Tools
1	**2.5**	Introduction to Entrepreneurship			
(i)	**2.5**	Understanding Entrepreneurship, Characteristics and types of Entrepreneurs, Types of Enterprises,	**CO1: Understand** a deep understanding of Entrepreneurship concepts such as idea generation, Opportunity Evaluation, Customer Discovery, Value Proposition Design and Prototyping	L2: Understand	Internal Quiz, External - Theory
2	2.5	Principles of Effectuation			
(i)	2.5	Principles of Effectuation, Entrepreneurship Style- 5 M Model,	CO2 **Apply** preferred traits of an entrepreneur such as creative thinking, risk-taking ability, problem-solving techniques, customer acquisition methods, prototyping, etc.	L3: Apply	Internal Quiz, Test External - Theory
3	**1.15**	Design thinking			
(i)	1.15	Design thinking -Introduction, Difference between causal thinking and Design Thinking, Steps of Design Thinking, Role of Design Thinking in creating solutions	CO2: **Apply** preferred traits of an entrepreneur such as creative thinking, risk-taking ability, problem-solving techniques, customer acquisition methods, prototyping, etc.	L3: Apply	Internal Assignment
4	1.15	Idea Generation			
(i)	1.15	Idea Generation Methods & Creative Problem Solving, Value Proposition	CO2 **Apply** preferred traits of an entrepreneur such as creative thinking, risk-taking ability, problem-solving techniques, customer acquisition methods, prototyping, etc.	L3: Apply	Internal- Presentation
5	1.15	Idea Evaluation			
(i)	1.15	Idea Evaluation- Mullins Framework/ Decision Matrix Analysis & 5 Q Model	CO3: **Analyze** the acquire knowledge of tools, techniques, and frameworks for starting a business venture and		Internal- Assignment
6	1.15	Customer Segment			
(i)	1.15	Value proposition and Customer segments	CO3: **Analyze** the acquire knowledge of tools, techniques, and frameworks for starting a business venture and	L4: Analyse	Internal- Quiz
7	**2.5**	Lean Canvas Model			

(i)	2.5	Lean Canvas Business Model, The Business Plan, why some Business Plans fail?	CO3: **Analyze** the acquire knowledge of tools, techniques, and frameworks for starting a business venture and	L4: Analyze	Internal- Assignment External - Theory
7	2.5	Entrepreneurial Finance			
(i)	2.5	Entrepreneurial Finance- Costing, Pricing, Funding & Sources of Capital Solution	CO3: **Analyze** the acquire knowledge of tools, techniques, and frameworks for starting a business venture and	L4: Analyze	Internal- Test,
8	**1.15**	Business Plan			
(i)	1.15	B-Plan Basics- Operations, HR	CO4: **Evaluate** the business idea and its feasibility and create the business model & MVP		Internal- Assignment External - Theory
9	1.15	Developing Prototype			
(i)	1.15	Demo, Prototyping and Minimum Viable Product (MVP)	CO4: **Evaluate** the business idea and its feasibility and create the business model & MVP	L4: analyze	Internal- Test,
10	**2.5**	Presentation			
(i)	**2.5**	Final Presentation of MVP	CO5 **Evaluate** the business idea and its feasibility and create the business model & MVP	L6: Create	Internal- Presentation

Pedagogy

14. Lecture
15. Case Studies, collaboration
16. Presentation and assignments
17. Quiz

Evaluation

Internal	40%
External	60%
Total	**100%**

Parameters of Internal Assessment:

- Attendance
- Class Participation
- Test
- Projects

Assessment Mapping

Parameter	Marks	CO 1	CO 2	CO 3	CO 4	CO 5
Internal	20	15%	18%	22%	24%	21%
Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Test	5	10%	20%	20%	20%	30%
Projects	5	-	-	30%	40%	30%
End Term	**30**		**10%**	**30%**	**30%**	**30%**

Textbook:

1. Entrepreneurship -Rajeev Roy, Oxford University Press, 2011
2.Tinkering Minds- Case Studies of Startups- Dr. Veni Nair & Prof. Vandana Tripathi

Alternative Textbook

1. Entrepreneurship: Robert D Hisrich, Michael P Peters, Dean A Shepherd, McGraw-Hill Publication, 10th Edition, Jan.2016

Reference Books:

1. Exploring Entrepreneurship- Practices and Perspectives, Richard Blundel, Nigel Lockett, Oxford. 2016
2.What They Don't Teach You at Harvard Business School: -McCormack, Mark H., Notes from a Street-Smart.
3.The High-Performance Entrepreneur - Subroto Bagchi, Penguin Books India, 2006
4.Entrepreneurship Strategies & Resources - Marc J. Dollinger, Pearson Education, 2004
5. Entrepreneurship - David H. Holt, New Venture Creation, Prentice Hall India, 2002

E-Books:
1. Entrepreneurship Simplified: From Idea to IPO, Ashok Soota and S R Gopalan 2016
2. Small Business and Entrepreneurship – S. Anil Kumar
3.Entrepreneurship: The Seeds 0f Success -Forbat, John - Harriman House – 2007 – Ebscohost
4. Entrepreneurship for Everyone - Katz, Jermone – Emerald -2010- Ebscohost

Course Title : Career Management - 1

Semester : I

Credit : 2

Duration : 40 hrs

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
CO1	Understand the nuances of an effective resume format to create profile specific resumes for campus placement.	**L2 -Understand**	**2**	Internal Assignment End Term- Practical
CO2	Develop the industry knowledge and skills to ace online and offline interviews for campus placements	**L4 - Analyse**	**4**	Internal GD End Term Practical
CO3	Apply elements of effective writing for developing engaging and impactful pieces of content.	**L3 - Apply**	**3**	Internal Assignment End Term Practical
CO4	Illustrate a summary of student's work experience, skills, and achievements on the professional social media platform, LinkedIn	**L3 - Apply**	**5**	Internal Role Play End Term Practical
CO5	Appraise self and peer contribution w.r.t verbal and non-verbal communication during Group Discussion for self-improvement	**L5 - Evaluate**	**2**	Internal GD, Role Play End Term Practical

Mapping with CO-PO

1 – Low, 2 – Medium, 3 – High, 0 – Low

CO Code	PO1	PO2	PO3	PO4	PO5
CO1	3	2	-	1	-
CO2	3	3	1	3	1
CO3	3	3	-	1	-
CO4	1	3	-	2	-
CO5	2	3	3	3	3
CO	**2.4**	**2.8**	**2.0**	**2.0**	**2.0**

Session Plan

Sess. No.	Hrs	Topic	COs	Cognition	Evaluation Tools
		Resume Building			
1	1	Roadmap			
2- 3	2	Resume Building (General Dos and Don'ts of resume)	CO1- Understand the nuances of creating an effective resume and use a tailormade resume according to the profile applied for during campus placement.	L2: Understand	Internal Assignment End Term Practical
4 & 5	2	Resume Building ITM Resume Format	CO3- Apply elements of effective writing for developing engaging and impactful pieces of content.	L3: Apply	Internal Assignment End Term Practical
		Social Medial Management			
6 &7	3	LinkedIn Networking (Tips to capitalize Networking on LinkedIn)	CO4 - Illustrate a summary of students' work experience, skills, and achievements on the professional social media platform, LinkedIn	Apply	Internal Role Play End Term Practical
8		+ 1 LinkedIn – Content Creation	CO4 - Illustrate a summary of student's work experience, skills, and achievements on the professional social media platform, LinkedIn	L3: Apply	Internal Role Play End Term Practical
		Resume Building			
9	1	Overview of a Group Discussion (Dos and Don'ts + outline for attempting abstract & current affairs-based GD topics)	CO2- Develop the industry knowledge and skills to ace live projects, online and offline interviews, group discussion for campus placements	L4: Analyse	Internal GD End Term Practical

10-12	2	Mock Group Discussion and GD assessment (current affairs and abstract assessment)	CO5 - Appraise self and peer contribution w.r.t verbal and non-verbal communication during Group Discussion for self-improvement	L5: Evaluate	Internal GD, Role Play End Term Practical
		Personal Interview			
13-14	3	Overview of P.I (Framework to answer basic interview questions)	CO2 - Develop the industry knowledge and skills to ace live projects, online and offline interviews, group discussion for campus placements	L4: Analyse	Internal Role Play End Term Practical
15-32		Mock PI	CO2 - Develop the industry knowledge and skills to ace online and offline interviews for campus placements	L4: Analyse	Internal Role Play End Term Practical

Pedagogy	
1. Lecture	
2. Case Study	
3. News/Article Analysis	
4. Live Activity/Exercise	
5. Videos	
Evaluation:	
Internal	40%
External	60%
Total	100%

Parameters of Internal Assessment:

1. Mock Interviews
2. Group Discussion
3. Class Participation
4. Attendance

Assessment Mapping

Parameter	Marks	CO 1	CO 2	CO 3	CO 4	CO 5
Internal	**40**	**10%**	**30%**	**30%**	**10%**	**20%**
Attendance	10	20%	20%	20%	20%	20%

Class Participation	10	20%	20%	20%	20%	20%
Assignment	5	40%		60%		
Group Discussion	5		50%		100%	50%
Role Play (Mock Interview)	10	25%	25%	10%	20%	20%
End Term	**60**	**10%**	**30%**	**30%**	**20%**	**10%**

Reference Books:

Interviews and GD – GK Publication
GD and Interview – R. Gupta and Anand Ganguly
How to succeed in GD and Interview - SK Mondal

Semester II

Course Code : **0210300311**
Course Title : **Business Database**
Semester : **II**
Credit : **2**
Duration : **20 hours (75 minutes per session)**
Course Faculty:

Course description:

This course describes the standard language, but also identifies deviations from the standard in using database product - Microsoft SQL Server for students to remember. In this course, students understand how to optimize the accessibility and maintenance of data with the SQL programming language, and gain a solid foundation for building, querying, and manipulating databases. The ability to write the SQL language — the cornerstone of all relational database operations — is essential for anyone who develops database applications. The SQL Language is an ANSI/ISO standard language used by all relational database products. For evaluation, the course environment allows the students to work with Microsoft SQL Server. The course creates, normalize, and use relational database models (DDL- Data definition language, DML- Data Manipulation language) to build database structures.

Course Outcomes

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
After the completion of course, students should be able to				
CO1	Classify the scope of DBMS with an emphasis on how to organize, maintain and retrieve efficiently, and effectively information from a DBMS.	K2: Understand	1.25	Internal Test, Quiz End Term- Theory
CO2	Implement DBMS concepts and inscribe SQL statements to extract information to satisfy business reporting requests.	K3: Apply	11	Internal- Assignment, Class test End Term- Numericals, Case study
CO3	Interpret complex SQL queries to retrieve information from databases with many tables to support business decision making.	K3: Apply	4.75	Internal- Test, Assignment End Term- Numericals, case Study

CO4	Relate the output after analysis of data using aggregate function to identify and use the appropriate SQL function to execute ad hoc queries.	K4: Analyse	2.25	Internal- Assignment, Class Test End Term- Numerical , case Study
CO5	Defend the results carried out using appropriate tools to make feasible business decisions.	K5: Evaluate	0.75	Internal- Assignment End Term- Case Study.

Mapping COs with POs

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / POs	PO 1	PO 2	PO 3	PO 4	PO 5	CO
CO1	3	1	-	-	-	**2.0**
CO2	1	-	2	-	-	**1.5**
CO3	-	-	3	-	-	**3.0**
CO4	-	-	3	-	-	**3.0**
CO5	-	-	3	-	-	**3.0**

Contents:

- SQL Overview
- Building the Database Schema
- Protecting data integrity with constraints
- Manipulating Data
- Working with the SELECT Statement
- Querying Multiple Tables
- Employing Functions in Data Retrieval
- Constructing Nested Queries

Session Plan:

Session	Hours	Topics	COs	Topics Mapped with CO	Evaluation Tools
1	**1.25**	**SQL Overview** 1. Outlining SQL as the cornerstone of database activity. 2.Applying the ANSI/ISO standards 3. Describing the fundamental building blocks: tables, columns, primary keys and foreign keys.	**CO1**	K2: Understand	Internal Test End Term- Theory
2,3	2.5	**Building the Database Schema :** Creating tables and columns •Building tables with CREATE TABLE •Modifying table structure with ALTER TABLE •columns to an existing table •Removing tables with DROP TABLE Protecting data integrity with constraints •Guaranteeing uniqueness with primary key constraints •Enforcing integrity with foreign key constraints	**CO2**	K3: Apply	Internal- Assignment End Term- Numericals,Case study
4,5	2.5	**Manipulating Data Modifying table contents** •Adding table rows with INSERT	**CO2**	K3: Apply K5 : Evaluate	Internal- Assignment End Term- Numericals,

		•Changing row content with UPDATE •Removing rows with DELETE Applying transactions •Controlling transactions with COMMIT and ROLLBACK •Deploying BEGIN TRANSACTION in SQL Server			Case Study
6	1.25	**Working with the SELECT Statement Writing Single Table queries** ·Retrieving data with SELECT ·Specifying column expressions ·Sorting the result with ORDER BY Handling NULL values in expressions	**CO2**	K3: Apply	Internal- Assignment End Term- Numericals , Case Study
7	1.25	**Restricting rows with the WHERE filter** •Testing for equality or inequality •Applying wildcard characters •Avoiding NULL value pitfalls	**CO2**	K3: Apply	Internal- Assignment End Term- Numericals, Case study
8	1.25	**Stacking results with UNION** Identifying matching rows with INTERSECT •Utilizing EXCEPT to find nonmatching rows	**CO3**	K3: Apply	Internal- Assignment End Term- Numericals, Case study
9	1.25	**Performing analysis with aggregate functions** •Summarizing data using SUM, AVG and COUNT •Finding the highest/lowest values with MAX and MIN •Defining the	**CO4**	K3: Apply K4: Analyse K5 : Evaluate	Internal- Test, Assignment End Term- Numericals, Case study

		summary level with GROUP BY •Applying filter conditions with HAVING			
10	1.25	**Constructing Nested Queries** **Applying sub queries in filter conditions** Correlated vs. non correlated sub queries •Testing the existence of rows Including sub queries in expressions •Placing sub queries in the column list •Creating complex expressions containing sub queries •Handling sub queries that return no rows	**CO3**	K3 : Apply K4: Analyse K5 : Evaluate	Internal- Test, Assignment End Term- Numericals, Case study
11	1.25	**Manipulating Data** **Modifying table contents:** Adding table rows with INSERT •Changing row content with UPDATE •Removing rows with DELETE Applying transactions •Controlling transactions with COMMIT and ROLLBACK •Deploying BEGIN TRANSACTION in SQL Server	**CO2**	K3: Apply K5 : Evaluate	Internal- Assignment End Term- Numericals, Case study
12	1.25	**Working with the SELECT Statement** **Writing Single Table queries** •Retrieving data with SELECT •Specifying column expressions •Sorting the result with ORDER BY •Handling NULL	**CO2**	K3: Apply K5 : Evaluate	Internal- Assignment End Term- Numericals, Case study

		values in expressions Restricting rows with the WHERE filter •Testing for equality or inequality •Applying wildcard characters •Avoiding NULL value pitfalls"			
13	1.25	INTERNAL ASSESSMENT	**CO2 CO3**	K3: Apply	Internal- Test Assignment End Term- Numericals, Case study
14	1.25	**Querying Multiple Tables** **Applying the ANSI/ISO standard join syntax** Matching related rows with INNER JOIN •Including non-attached rows with OUTER JOIN •Creating a Cartesian product with CROSS JOIN "Combining results with set operators: •Stacking results with UNION •Identifying matching rows with INTERSECT •Utilizing EXCEPT to find nonmatching	**CO3 CO5**	K3: Apply K5 : Evaluate	Internal- Test Assignment End Term- Numericals, Case study
15	1.25	**Employing Functions in Data Retrieval** **Performing analysis with aggregate functions** Summarizing data using SUM, AVG and COUNT •Finding the highest/lowest values with MAX and MIN •Defining the summary level with	**CO4 CO5**	K4: Analyse K5 : Evaluate	Internal- Test Assignment End Term- Numericals, Case study

		GROUP BY •Applying filter conditions with HAVING			
16	1.25	**Constructing Nested Queries** **Applying sub queries in filter conditions** Correlated vs. non correlated sub queries •Testing the existence of rows Including sub queries in expressions •Placing sub queries in the column list •Creating complex expressions containing sub queries •Handling sub queries that return no rows	**CO3 CO5**	K3: Apply & K5 Evaluate	<u>Internal-</u> Test Assignment <u>End Term-</u> Numericals, Case study

Pedagogy

1. Lecture
2. Case Study
3. News/Article Analysis
4. Live Activity/Exercise
5. Videos

Modes of Evaluation & Examination Scheme:

Evaluation:	
Internal Assessment	20 Marks
External Assessment	30 Marks
Total	50 Marks

Internal Assessment:	
Class Attendance	5 Marks
Class Participation	5 Marks
Class Test	5 Marks
Assignment	5 Marks

External Assessment:	
End Term Examination	30 Marks

Assessment Mapping:

Parameter	Marks	CO-1	CO-2	CO-3	CO-4	CO-5
Internal	20	10%	70%	10%	5%	5%
Class Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Class Test	5	85%	5%	5%	5%	0%
Assignment	5	0%	25.00%	37.50%	37.50%	0%
End Term	30	20%	40%	0%	40%	0%

Text Book: Fundamentals of Database System, Elmasri Ramez (Author), Navathe Shamkant (Author), Seventh Edition, Pearson ,2017.

Reference Books:

18. Database System Concepts ,Abraham Silberschatz (Author), Henry Korth (Author), S. Sudarshan (Author) , Sixth edition, Mc Graw Hill International Edition,2016.

19. **Database Systems: The Complete Book, 2e** , Molina, Second Edition, Pearson Publication.

20. (c) Professional SQL Server 2012 Internals and Troubleshooting: Christian Bolton (Author), Justin Langford (Author), Glenn Berry (Author), Gavin Payne (Author), Amit Banerjee (Author), Rob Farley (Author) .

21. The Database Book: Principles & Practice Using MySQL, Narain Gehani, Silicon Press; 2 edition.

22. Microsoft SQL Server 2016: A Beginner's Guide, Dusan Petkovic, Sixth Edition, Mc Graw Hill.

Other Resources:

1. https://www.tutorialspoint.com/sql/index.htm.
2. https://www.w3schools.com/sql/default.asp
3. https://www.javatpoint.com/sql-tutorial
4. http://beginner-sql-tutorial.com/sql.htm
5. http://www.sqlcourse.com/

E-books:

10. https://www.hcoe.edu.np/uploads/attachments/r96oytechsacgzi4.pdf
11. https://downloads.mysql.com/docs/mysql-tutorial-excerpt-5.5-en.pdf

Course Code	
Course Title	Optimization Techniques
Semester	II
Credit	4
Duration	40 hours (75 minutes per session)
Course Faculty	Vijayanta Pawase

Course Outcome (CO)	Description	Cognition	Hours	Evaluation Tools
After the completion, of the course, students should be able to				
CO-1	Discuss the fundamentals of business analytics using optimization techniques.	K2: Understand	2.5	End term: Theory
CO-2	Implement the industry-relevant optimization techniques and algorithms to provide solutions to business problems.	K3: Applying	12.5	Internal Evaluation: Class Test, Assignment, and Case Study. End term: Numerical and Theory.
CO-3	Differentiate the optimization techniques for solving real-time problems and improve the speed, reliability, and quality of decisions in business.	K4: Analyzing	11.25	Internal Evaluation: Class Test, Assignment, and Case Study. End term: Numerical and Theory.
CO-4	Interpret the mathematical solution/output generated by the Optimization techniques for a business problem.	K5: Evaluating	7.5	Internal Evaluation: Class Test, Assignment, and Case Study. End term: Numerical and Theory.
CO-5	Formulate business situations/ problems into mathematical optimization models for the finding pragmatic solutions.	K6: Creating	2.5	Internal Evaluation: Class Test, Assignment, and Case Study. End term: Numerical.

Mapping COs with Pos:
Scale: 1= Low Alignment, 2=Moderate Alignment, 3=High Alignment, - =No Alignment

COs / POs Code	PO1	PO2	PO3	PO4	PO5
CO-1	2	2	0	3	1
CO-2	3	3	2	3	3
CO-3	3	3	2	3	3
CO-4	3	3	2	3	3
CO-5	3	3	0	3	3
CO	2.8	2.8	1.2	3	2.6
CO EQ	3	3	1	3	3

Session	Hours	Units	Reading Material	COs	Cognition
1 & 2	2.5	Introduction: Role of Quantitative Optimization Techniques Analysis in Decision Making			
	2.5	Understand the role that optimization plays in business analytics and identify when optimization modeling is an appropriate technique to inform the decision-making process.	Chapter 1: ND & BR	CO-1	K2: Understand
3 to 5	3.75	Linear Programming I			
	2.5	Formulation LPP	Chapter 2: ND	CO-5	K6: Creating
	1.25	Graphical Solution		CO-2	K3: Applying
6 to 9	5	Linear Programming II			
	5	Simplex Method Big- M Method Two-Phase Method	Chapter 3: ND	CO-2	K3: Applying
10 & 11	2.5	Linear Programming III			
	2.5	Duality and Sensitivity Analysis	Chapter 4: ND Chapter 8: BR	CO-3	K4: Analyzing
12 to 14	3.75	Linear Programming Transportation Optimization Models			
	2.5	Methods of Feasible Solution: North-West Corner Rule, Row Mini-Max, Column Mini Max, Least Cost Method, Vogel's, Modi method, Degeneracy, and Unbalanced Transportation Problems.	Chapter 5: ND	CO-2	K3: Applying
	1.25	Maximization, Minimization Types Problem, and Allocation Restrictions.		CO-3	K4: Analyzing
15 to 17	3.75	Linear Programming Assignment Optimization Models			
	2.5	HAM Method, Balanced and Unbalanced problem.	Chapter 6: ND	CO-2	K3: Applying
	1.25	Maximization and Minimization Types		CO-3	K4: Analyzing
18 & 19	2.5	Integer and Mixed-Integer Programming and Application.			
	2.5	Gomory's cutting plane method for all Integer Programming Problems (IPP) and Mixed Integer Programming (MIP).	Chapter 7: ND Chapter 11: BR	CO-3	K4: Analyzing
20	1.25	Test I			
21 & 22	2.5	Goal Programming			
	2.5	Examples of Goal programming, Extension to Equally Important Multiple Goals.	Chapter 7: ND	CO-3	K4: Analyzing
23 to 26	5	Network Optimization			
	5	PERT and CPM	Chapter 14: ND	CO-4	K5: Evaluating
27 to 30	5	Game Theory			
	1.25	Game Models, and Two-person Zero-Sum Game.	Chapter 8: ND	CO-2	K3: Applying
	2.5	Solution of 2 x n and n x 2 Games, Games of Pure and Mixed Strategy.		CO-4	K5: Evaluating
	1.25	Principle of Dominance		CO-3	K4: Analyzing
31	1.25	Test II			
32	1.25	Presentation			

Pedagogy

1. **Lecture**
2. Case Study
3. Solver application

Assessment Criteria:

Evaluation:	
Internal Assessment	40 Marks
External Assessment	60 Marks
Total	100 Marks

Internal Assessment:	
Class Attendance	5 Marks
Class Participation	5 Marks
Class Test	10 Marks
Assignment	10 Marks
Case Study	10 Marks

External Assessment:	
End Term Examination	60 Marks

Assessment Mapping:

Parameter	**Marks**	**CO-1**	**CO-2**	**CO-3**	**CO-4**	**CO-5**
Internal	40	5%	31%	26%	21%	16%
Class Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Class Test	10		40%	30%	20%	10%
Assignment	10		40%	30%	20%	10%
Case Study	10		25%	25%	25%	25%
End Term	60	6%	30%	30%	20%	6%

Textbook:
Quantitative Techniques in Management, N D Vohra, 5th Edition, Tata McGraw Hill, 2017. (ND)

Reference Books:
Quantitative Methods for Business - Anderson, Sweeney & Williams, Cengage Learning, Edition sixth, 2010. (AS)
Quantitative Analysis for Management - Barry Render, Ralph M. Stair, Jr., Michael E. Hanna, T N Badri,Edition 1, 2009, Pearson, Education. (BR)
Essentials of Operations Research & Quantitative Techniques – K Shridhara Bhat, Edition second, 2010, Himalaya Publishing House. (KS)
Quantitative Techniques for Managerial Decisions – R B Khanna, Edition second, 2013, PHI Learnings. (RB)
Quantitative Methods Theory and applications - J K Sharma, Mac Milan, 2010. (J.K)

Course Code : **0210300316**
Course Title : **Research Process and Analytics**
Semester : **II**
Credit : **4**
Duration : **40 hrs (75 minutes per session)**
Course Faculty:

Course Description

This course is designed to cover an ideal introduction to the theory and practice of research and research methods. At the end of this course, students will be able to develop data enabled research approaches, model building skills, and importantly an ability to deploy them with excel, spss, pspp in their professional life. Each module progresses with building foundation and conceptual knowledge followed by application using cases and insightful classroom activities. In addition to case studies, learning materials in form of articles, simulations, role plays and other experiential activities it also covers interpretation of results and inhibit managerial skill of handling a critical consumer. The course also considers to enhance the communication skills, analytic skills, ethical reasoning, use of information technology, working in a multicultural ambiance with reflective thinking capability.

Course Outcomes:

Course Outcomes (CO):	Description	Cognition	Hours	Evaluation Tools
CO1	Discuss the need ,importance and various concepts related to research, research methods and process in its holistic sense.	K2: Understand	**24.75**	Internal Class Test End Term Theory
CO2	Execute theoretical knowledge that constitutes research methodology organised around the operational steps that form research process for both Quantitative and Qualitative research.	K3: Apply	**3.5**	Internal Class Viva, Assignment End Term Theory
CO3	Implement different strategies with the outcome of research methods and process to design, conduct and document an effective scientific research project	K4: Apply	**4.25**	Internal Class Viva, Assignment End Term Theory
CO4	Examine the data to interpret results and inhibit managerial skill of handling a critical consumer	K5: Analyse	**4.0**	Internal Class Viva, Project Report and Presentation End Term Theory

CO5	Differentiate amongst value propositions using the research tools and multivariate techniques in an integrated manner for organizational benefits.	K5: Analyse	**3.5**	Internal Class Viva, Project Report and Presentation End Term Theory

Mapping COs with POs

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / Pos	PO 1	PO 2	PO 3	PO 4	PO 5	CO
CO1	3	-	-	-	-	**3.0**
CO2	-	-	3	-	-	**3.0**
CO3	-	-	3	-	-	**3.0**
CO4	-	-	3	-	-	**3.0**
CO5	-	-	3	-	-	**3.0**

Course Contents:

- Introduction to business research methodology
- Research process.
- Qualitative research.
- Sampling and sampling methods.
- Questionnaire designing.
- Data collection methods.
- Use of computer software in data analysis.
- Cross tabulation, Chi-Square for Cross tabs, interpreting a Chi-Square, Charting a Cross tab, Clustered Bar Chart, Analysing multiple response data.
- Report generation, report writing, and APA format – Title page, Abstract, Introduction, Methodology, Results, Discussion, References, and Appendices
- Marketing research and marketing problems
- Variables and types of Variables
- Independent T Test, Paired T Test, ANOVA
- Correlation, Simple Regression & Multiple Regression.
- Analysis of managerial problems & survey results using SPSS for Discriminant Analysis, Factor Analysis, Cluster Analysis, Multi-Dimensional Scaling .
- Report presentation on survey based live project in marketing areas

Session plan:

Sr. No	Hrs.	Units	Cos	Topics Mapped with CO	Evaluation Tools
1	1.25	Introduction to business research methodology.	CO1	K2: Understand	Internal Class Test End Term Theory
2	1.25	Research process	CO1	K2: Understand	Internal Class Test End Term Theory
3,4	2.5	Qualitative research	CO1	K2: Understand	Internal Class Test End Term Theory
5	1.25	Sampling and sampling methods	CO1	K2: Understand	Internal Class Test End Term Theory
6,7	2.5	Measurement & Scaling.	CO1	K2: Understand	Internal Class Test End Term Theory
8,9,10	3.75	Questionnaire designing Practical exercise for questionnaire designing.	CO1& CO2& CO3	K2: Understand & K3: Apply & K4: apply	Internal Class Test,Viva, Assignment End Term Theory

11,12	2.5	Data collection methods	CO1	K2: Understand	Internal Class Test End Term Theory
13,14	2.5	Use of computer software in data analysis Data presentation in SPSS, data entry and data transformation.	CO2& CO3	K3: Apply & K4: apply	Internal Class Viva, Assignment End Term Theory
15	1.25	Cross tabulation, Creating Basic Cross tabs, Creating Layered Cross tabs, Chi-Square for Cross tabs, interpreting a Chi-Square, Charting a Cross tab, Clustered Bar Chart, Analysing multiple response data.	CO2, CO3, CO4 & CO5	K3: Apply K4: Apply K5: Evaluate	Internal Class Viva, Assignment, Project Report and Presentation End Term Theory
16	1.25	Defining Market Research Problem and Developing an approach. Variables, Types of variables.	CO1	K2: Understand	Internal Class Test End Term Theory
17,18,19	3.75	Independent T test, Paired T test, ANOVA, Correlation.	CO1	K2: Understand	Internal Class Test End Term Theory
20,21,22	3.75	Simple Regression, Multiple Regression	CO1	K2: Understand	Internal Class Test End Term Theory

23,24,25,26	5	Analysis of managerial problems & survey results using SPSS	CO4 & CO5	K5: Evaluate	Internal Class Viva, Project Report and Presentation End Term Theory
27,28,29	3.75	Report generation, report writing, and APA format – Title page, Abstract, Introduction, Methodology, Results, Discussion, References, and Appendices	CO1	K2: Understand	Internal Class Test End Term Theory
30,31,32	3.75	Presentations on Live project and internal evaluations	CO2, CO3, CO4 & CO5	K3: Apply K4: Apply K5: Evaluate	Internal Class Viva, Assignment, Project Report and Presentation End Term Theory

Pedagogy:
Lecture
Case Study
News/Article Analysis
Live Activity/Exercise
Assessment Criteria:

Evaluation:	
Internal Assessment	40 Marks
External Assessment	60 Marks
Total	100 Marks

Internal Assessment:	
Class Attendance	5 Marks
Class Participation	5 Marks
Class Test	10 Marks
Assignment	10 Marks
Project	10 Marks

External Assessment:	
End Term Examination	60 Marks

Assessment Mapping:

Parameter	Marks	CO-1	CO-2	CO-3	CO-4	CO-5
Internal	40	15%	18%	22%	24%	21%
Class Attendance	5	33%	17%	17%	17%	16%
Class Participation	5	33%	17%	17%	17%	16%
Class Test	10	10%	5%	5%	40%	40%
Assignment	10	90%	3%	2%	2%	3%
Project	10	10%	40%	40%	5%	5%
End Term	60	80%	5%	5%	5%	5%

Text Book:

1) Marketing Research: Naresh Malhotra, Pearson Education, New, 6th Edition, 2011

Reference Books:

1) Marketing Research: Rajendra Nargundkar, Tata McGraw-Hill, 3rd Edition, 2012

2) Essentials of Market Research: ZikMund, Cengage Learning, 3rd Edition, 2007

3) Research methods for Business Students: Mark Saunders, Philip Lewis, Pearson India Education Services Pvt Ltd., 5th Edition, 2014

4) Marketing Research, G C Beri, Tata McGraw-Hill, 5th Edition, 2013

5) Business Research Methods: Cooper and Schindler, Tata McGraw-Hill, 11th Edition, 2013

6) Business Research Methods: William Zikmund, Cengage Publications, 8th Edition, 2016

E-Books:

23. http://manzaramesh.in/prephdbooks/Research Methodology - Methods and Techniques 2004.pdf

24. http://web.ftvs.cuni.cz/hendl/metodologie/marketing-research-an-introduction.pdf

25. http://164.100.133.129:81/econtent/Uploads/Marketing_Research.pdf

26. http://www.pondiuni.edu.in/sites/default/files/MARKETING%20RESEARCH200813.pdf

27. http://www.modares.ac.ir/uploads/Agr.Oth.Lib.17.pdf

Course Code : **0210300317**
Course Title : **Analytics for Marketing and Sales**
Semester : **II**
Credit : **2**
Duration : **20 hours (75 minutes per session)**
Course Faculty:

Course Description

The main objective of this course is to help the students to learn the process of measuring, analysing & managing marketing performance to maximize its effectiveness & optimize return on investment. The course is designed to cover data-driven decision-making processes involved with respect to products, services, pricing, promotion and placement by exploring, understanding and applying concepts like data profiling, customer lifetime value, market basket and RFM analysis. Each module progresses with building foundation and conceptual knowledge followed by application using statistical and marketing analytic tools. At the end of this course, students will learn to become more efficient in their jobs and minimize wasted marketing budget. They will be able to appreciate the skills acquired to be applied in Business Analyst Roles which will enable them to help companies understand what products people want, who buy them, at what price and the like.

Course Outcomes

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
After the completion of course, students should be able to				
CO 1	Describe the process of marketing research data and get overview of marketing analytics for making best decisions.	**K2 -Understand**	**3.5**	Internal Test End Term- Theory
CO2	Implement Data Mining techniques and machine learning models for understanding customer purchase pattern, research process and algorithms to develop strategies, tactics, and financials for organizations.	**K-3 Apply**	**4.5**	Internal Assignment End Term- Theory, Case Studies
CO3	Test the output from analysis into managerial insights that is understandable to stake holders.	**K-4 Analyse**	**6.5**	Internal Assignment GD End Term- Case Studies

CO4	Weigh model quality with statistical metrics to identify best model for optimizing business strategies.	**K-5 Evaluate**	**3.2**	Internal Assignment GD End Term- Case Studies
CO5	Critique the performance of a marketing activity by applying technology and analytical processes to marketing-related data and understand what drives consumer actions.	**K-5 Evaluate**	**2.3**	Internal Assignment GD End Term- Case Studies

Mapping COs with POs

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / POs	PO 1	PO 2	PO 3	PO 4	PO 5	CO
CO1	3	3	1	-	-	**2.3**
CO2	-	3	3	-	-	**3.0**
CO3	-	3	3	-	2	**2.6**
CO4	1	1	3	-	-	**1.6**
CO5	-	-	3	-	-	**3.0**

Contents:

- Introduction to Marketing Analytics and Customer Analysis
- Market Segmentation
- Customer Lifetime Value
- Pricing Analytics and Optimization
- RFM Analysis
- Market Basket Analysis

Session Plan

Sr.NO	Hours	Units	COs	Topics Mapped with CO	Evaluation Tools
1	1.25	Introduction to Marketing Analytics Why Marketing Analytics, Marketing Process, Data to improve marketing strategy	CO1	K2 -Understand	Internal Test End Term-Theory
2	1.25	Introduction to Marketing Analytics Marketing process, Strategic challenge, Marketing Strategy with data	CO1	K2 -Understand	Internal Test End Term-Theory
3	1.25	Recency, Frequency & Monetary (RFM) Analysis About RFM, Predicting & Targeting the right customers, Customer segments based on RFM model	CO2	K-3 Apply	Internal Assignment End Term-Theory, Case Studies
4	1.25	Recency, Frequency & Monetary (RFM)Analysis RFM score calculation for developing customer, RFM application to your business, Retaining customers	CO2 & CO3	K-3 Apply, K-4 Analyze	Internal Assignment , GD End Term-Theory, Case Studies
5	1.25	Customer Lifetime Value (CLV) What is CLV, Understanding CLV Formula	CO1	K2 -Understand	Internal Test End Term-Theory
6	1.25	Customer Lifetime Value (CLV) Extending CLV Formula - I, II	CO2, CO3	K-3 Apply, K-4 Analyse	Internal Assignment, GD End Term-Theory, Case Studies
7	1.25	Customer Lifetime Value (CLV) Calculating CLV, Using CLV to make decisions	CO2, CO3 & CO4,CO5	K-3 Apply, K-4 Analyse, K-5 Evaluate	Internal Assignment,, GD End Term-Theory, Case Studies
8	1.25	Customer Lifetime Value (CLV) Applying CLV Formula – Netflix	CO2, CO3 & CO4,CO5	K-3 Apply, K-4 Analyze, K-5 Evaluate	Internal Assignment,, GD, End Term-Theory, Case Studies
9,10,11,12	5	Market Basket Analysis	CO2, CO3 & CO4,CO5	K-3 Apply, K-4 Analyze,K-5 Evaluate	Internal Assignment, GD End Term-Theory, Case Studies
13,14,15,16	5	Pricing Analytics	CO2, CO3 & CO4,CO5	K-3 Apply, K-4 Analyse, K-5 Evaluate.	Internal Assignment,, GD, End Term-Theory, Case Studies

Modes of Evaluation & Examination Scheme:

Evaluation:	
Internal Assessment	20 Marks
External Assessment	30 Marks
Total	50 Marks

Internal Assessment:	
Class Attendance	5 Marks
Class Participation	5 Marks
Class Test	5 Marks
Assignment	5 Marks

External Assessment:	
End Term Examination	30 Marks

Assessment Mapping:

Parameter	**Marks**	**CO-1**	**CO-2**	**CO-3**	**CO-4**	**CO-5**
Internal	20	20%	20%	20%	20%	20%
Class Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Class Test	5	100%	-	-	-	-
Assignment	5	-	25%	25%	25%	25%
End Term	30	60%	40%	0%	0%	0%

Textbook:

Marketing Metrics – The Manager's guide to Measuring Marketing Performance, 3rd Edition (paperback 2016), Paul W. Farris, Neil T. Bendle, Philip E. Pfeifer, David J. Reibstein, Pearson Publications.

Reference Books:

1. Mastering Market Analytics: Business Metrics - Practice and Application, Robert Kozielski, 1st Edition (2018), Emerald Publishing Limited.
2. Marketing Analytics: Data-Driven Techniques with Microsoft Excel, Wayne L. Winston, 1st Edition, Wiley Publications.

EBooks:

1.http://ptgmedia.pearsoncmg.com/images/9780133592924/samplepages/9780133592924.pdf

2.https://www.researchgate.net/publication/311569434_Recency_Frequency_and_Monetary_Model

3.https://www.researchgate.net/publication/338961311_Customer_Segmentation_Based_On_Recency_Frequency_Monetary_Model_A_Case_Study_in_E-Retailing

Specialisation : **BA**
Course Title : **Selling Skills**
No. of Credits : **2**
Contact Hours : **20**

Course Description: Selling and Customer interaction forms the backbone of all the departments. It is therefore imperative to instil these abilities in the PGDM course syllabus for the students. The purpose of selling may differ specialization wise- for example for a retail marketing person selling may be CRM and engaging the customer, whereas in HR terms it is, how effectively one can pitch the job at hand to a prospect. These modules have been curated keeping the specialization and purpose in mind.

Course Outcomes	Description	Cognition
CO 1	Describe the introductory concepts related to selling and salesperson	**K2- Understand**
CO 2	sketch a list of the competitors to classify them	**K3 – Apply**
CO 3	Solve the various ethical dilemmas associated with selling practices	**K 3 – Apply**
CO 4	Execute a plan of action for pre-selling preparations	**K 3 – Apply**
CO5	Interpret a situation to design a sales pitch, with the help of Role-play and devise the appropriate solution for the customer as per their requirement.	**K 3 – Apply**

The CO – PO Correlation matrix for the subject is given below:

1 – Low, 2 – Medium, 3 – High, 0 – Low

COs / Pos	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**
CO1	1	2	1	2	3
CO2	1	2	1	2	3
CO3	3	3	2	2	3
CO4	3	3	2	2	3
CO5	3	3	3	3	3
	2.2	2.6	1.8	2.2	3

Course content:

- Sales Process
- Product information
- Stores Operation
- Fabing technique
- Customer analysis
- Buying pattern
- Closing the sales call

Session Plan

Session	Topic	TOPIC Mapped with CO	Evaluation Tools
1	Introduction to Sales, Define selling & the sales process , How is sales different from marketing Difference between a product and service, Importance of product Information	CO1	Internal Test End Term-Theory
2	Attributes of a Professional Salesperson Teamwork Assertiveness Effective communication Emotional Intelligence Famous salesmen through the ages	CO2	Internal Test End Term-Theory
3	Sales and Ethics Pillars of professional selling Ethical selling Ethical dilemmas Consequences of mis-selling Appropriate behaviour Anger management	CO1	Internal Assignment End Term-Theory, Case Studies
4	Understanding Customer Base Customer profiling – why is it necessary? Demographics & Segmentation Types of customer personalities Handling different types of customers Influencers	CO2	Internal Assignment , GD End Term-Theory, Case Studies

5	How and Why of Competitor Analysis Current products and real-life competitors	CO2	Internal Assignment , GD End Term- Theory, Case Studies
6	FABing technique Real-life products and their FAB attributes	CO3	Internal Test End Term- Theory
7	Introduction to SPANCO Suspecting and Prospecting	CO3	Internal Test End Term- Theory
8	Methods of Prospecting BTL Marketing	CO3	Internal Assignment End Term- Theory, Case Studies
9	Introduction to ODPEC Approaching the client	CO3	Internal Assignment , GD End Term- Theory, Case Studies
10	Persuasive Communication (Ethos/ Pathos/ Logos)	CO3	Internal Assignment , GD End Term- Theory, Case Studies
11	Identifying Customer Needs Listening skills (SPIN) Probing and questioning skills	CO2	Internal Test End Term- Theory
12	Proposing a Solution & Eliminating Doubts through the Art of Storytelling	CO4	Internal Test End Term- Theory
13	Closing a Call Handling uncertain situations	CO4	Internal Assignment End Term- Theory, Case Studies
14	Selling Business solutions Identifying the right customers	CO2, CO4	Internal Assignment , GD End Term- Theory,

			Case Studies
15	Recap & Practicing Selling Skills through Role-Play	CO4	Internal Test End Term-Theory
16	Assessment	CO4	Internal Test End Term-Theory

Pedagogy

1. Lecture
2. Case Study
3. News/Article Analysis
4. Live Activity/Exercise
5. Videos

Evaluation:

Internal	40%
External	60%
Total	100 %

Parameters of Internal Assessment:

1. Class Assignment
2. Class Test
3. Classroom Discussion
4. Case Study Analysis
5. Class Participation
6. Presentation

Assessment Mapping

Parameter	Marks	CO 1	CO 2	CO 3	CO 4	CO 5
Internal	20	10%	25%	25%	20%	20%
Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Class Test	5	10%	10%	20%	30%	30%
Presentation	5	-	40%	40%	-	20%
End Term	**30**	**10%**	**10%**	**25%**	**25%**	**30%**

Reference Book:

11. **The Psychology of Selling**: Increase Your Sales Faster and Easier Than You Ever Thought Possible" by Brian Tracy

12. "**SPIN** Selling" by Neil Rackham

13. "**How to Master the Art of Selling**" by Tom Hopkins

14. "**Influence**: The Psychology of Persuasion" by Robert B. Cialdini

15. "**Secrets of Closing the Sale**" by Zig Ziglar

Course Code : **0210300318**
Course Title : **Analytics in Banking Services**
Semester : **II**
Credit : **2**
Duration : **20 hours (75 minutes per session)**

Course Description

Learning implementation of analytics can be great sources of competitive advantage which can help banks secure revenue streams especially under adverse conditions for students to remember. In this course, students will understand real-life application of analytics in banking sector using cases which exist in many segments of the banking industry. Application of analytics holds the potential to grow revenues, control risks, and increase efficiency across the entire banking value chain. Using analysis banks can determine the most promising areas of application and reap the benefits before others beat them to it. Students learn to evaluate how bank should treat data as an asset and make analytical capability a core competence across all its functions. Lastly, students will be able to leverage an actual use case to illustrate the challenges and benefits of implementing banking analytics.

Course Outcomes

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
After the completion of course, students should be able to				
CO1	Explain the fundamentals of banking analytics that enhance the performance of the banks and help the institution and its employees make a better decision for the future.	K2: Understand	**9.25**	Internal Class Test End Term Theory
CO2	Implement analytics in banking which lead to strategies that will generate the highest returns. .	K3: Apply	**0.75**	Internal Assignment, Class test End Term Theory, Case Study
CO3	Examine the output from real time banking problems to improve the speed, reliability, and quality of decisions in banking.	K4: Analyse	**8.25**	Internal Class Test, Class activity End Term Case study
CO4	Weigh model quality with statistical metrics to identify best model for optimizing business strategies.	K5: Evaluate	**1.00**	Internal Assignment, Class test, Class Activity End Term Case Study
CO5	Appraise the business value of analytics to derive value propositions for BFSI sector.	K5: Evaluate	**0.75**	Internal Assignment,

				Class test, Class Activity End Term Case Study

Mapping COs with POs

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / POs	PO 1	PO 2	PO 3	PO 4	PO 5	CO
CO1	3	-	-	-	-	**3.0**
CO2	-	-	3	-	-	**3.0**
CO3	-	-	3	-	-	**3.0**
CO4	-	-	3	-	-	**3.0**
CO5	-	-	3	-	-	**3.0**

Contents:

- Introduction to banking analytics
- Reports and MIS
- Similar portfolios
- Leading Indicators and associated variables
- Reinsurance value calculation
- Clustering
- Probability Model

Session Plan:

Sr.NO	Hours	Units	COs	Topics Mapped with CO	Evaluation Tools
1		**Banking**			

	1.25	7 types of Banking and Financial Services institutions Regulatory compliance in Banking Key processes - Front office, Middle office, Back office; Commercial (Retail) Banking, Insurance and Investment banking	CO1	K2: Understand	Internal Class Test End Term Theory
2		**Banking Analytics**			
	1.25	Banking Analytics - Risk Vs Marketing Usage of licensed vs unlicensed software in banking Bigdata and its impact; Blockchain in Banking Getting Started with Analytics	CO1	K2: Understand	Internal Class Test End Term Theory
3		**Technical Tool for Analytics**			
	1.25	Demonstrate the Basics of SAS and R	CO1&CO2	K2: Understand & K3: Apply	Internal Assignment Class test End Term Theory , Case Study
4		**Concepts**			
	1.25	Visualization basics Types of Data in Banking at portfolio level	CO1	K2: Understand	Internal Class Test End Term Theory
5		**Case Study**			
	1.25	A new Manager joins the bank. She wants to understand the overall trends in the portfolio data and which are the most frequent values across different products in the portfolio.	CO4 , CO5	K5: Evaluate	Internal Assignment End Term Case Study
6		**Concepts**			
	1.25	Dimensions of financial products	CO3	K4: Analyse	Internal Class Test,

		Hypothesis testing to understand similarities			Class activity End Term Case Study
7		**Case Study**			
	1.25	The RBI has created a table to understand the return on portfolio for different credit cards across different banks .This data is tabulated on a monthly basis .The RBI is keen to understand if the different card portfolios of the Bank is showing similar performance.	CO3	K4: Analyse	Internal Class Test, Class activity End Term Case Study
8		**Concepts**			
	1.25	Associative Analytics and relationships	CO3	K4: Analyse	Internal Class Test, Class activity End Term Case Study
9		**Case Study**			
	1.25	An insurance company has data on individuals on total money spent in Life Insurance Products, Health Insurance Products and the Total Gross Salary (In lakhs). It wants to understand what a better indicator for the amount is spent on Life insurance, the health insurance or the customers earning.	CO1	K2: Understand	Internal Assignment End Term Theory
10		**Concepts**			
	1.25	Insurance process of re-insurance Linear Regression and Causality modelling	CO3	K4: Analyse	Internal Class Test, Class activity End Term Case Study
11		**Case Study**			
	1.25	There is a company which uses many different types of parts which are supplied by different vendors. It wants to cluster the parts to identify	CO1	K2: Understand	Internal Assignment

		groups which are ordered together for more efficient inventory management			End Term Theory
12		**Concepts**			
	1.25	Clustering and different approaches	CO3	K4: Analyse	Internal Class Test, Class activity End Term Case Study
13		**Case Study**			
	1.25	An investment banking manager has the details of Earnings across different industries. It wants to look at the current details of performance and conclude which segments can be clustered together so that he can then assign Relationship Managers accordingly.	CO1	K2: Understand	Internal Assignment End Term Theory
14		**Concepts**			
	1.25	Fraud as the biggest loss in Financial Services Logistic Regression	CO3 CO4 CO5	K4: Analyse K5 : Evaluate	Internal Class Test, Class activity End Term Case Study
15 & 16		**Case Study**			
	2.5	Predict Probability of a customer being a fraud looking at the portfolio	CO1 & CO3 CO4 , CO5	K2: Understand & K4: Analyse K5 : evaluate	Internal Class Test, Class activity End Term Case Study

Pedagogy

1. Lecture
2. Case Study
3. News/Article Analysis
4. Live Activity/Exercise
5. Videos

Modes of Evaluation & Examination Scheme:

Evaluation:	
Internal Assessment	20 Marks
External Assessment	30 Marks
Total	50 Marks

Internal Assessment:	
Class Attendance	5 Marks
Class Participation	5 Marks
Class Test	5 Marks
Assignment	5 Marks

External Assessment:	
End Term Examination	30 Marks

Assessment Mapping:

Parameter	**Marks**	**CO-1**	**CO-2**	**CO-3**	**CO-4**	**CO-5**
Internal	20	6%	6%	24%	32%	32%
Class Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Class Test	5	0%	0%	20%	40%	40%
Assignment	5	0%	0.00%	37.50%	31.25%	31%
End Term	30	50%	50%	0%	0%	0%

Text Book:
Intelligent Credit Scoring: Siddiqi Naeem, John Wiley & Sons Inc, Latest Edition

Reference Books:
Business Analytics for Banking: Jovan Pehcevski, (editor's name) Arcler Press LLC, Latest Edition

Course Code : **0210300319**
Course Title : **Talent analytics**
Semester : **II**
Credit : **2**
Duration : **20 hours (75 minutes per session)**

Course Description

This course introduces the theory, concepts, and business application of human resources research, data, metrics, systems, analyses, and reporting for students to remember. The course develops an understanding of the role and importance of talent analytics, and the ability to track, store, retrieve, analyse and interpret HR data to support decision making. The course helps to evaluate tools of communicate through presentation of Analytics and thereby influence key business decisions. Using the course, students develop skills on use of Statistical Software to develop predictions related to the Workforce and various HR Operations. The student will use applicable benchmarks/metrics to conduct research and statistical analyses related to Human Resource Management and will prepare to create reports to present findings and recommendations.

Course Outcomes

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
After the completion of course, students should be able to				
CO1	Explain fundamentals of talent analytics ,HR data processes, and HR functions for better performance in the organization.	K2: Understand	**10.25**	Internal- Class Test, Practical, Class Activity End Term- Case study , Numericals, Theory
CO2	Apply industry-relevant talent analytics concepts for decision making in business.	K3: Apply	**1.666**	Internal- Class Test, Practical, Class Activity End Term- Case study , Numericals, Theory
CO3	Examine various alternatives from real world data to cope up with the futuristic challenges and competitions in business with talent analytics	K4: Analyse	**7.25**	Internal- Class Test, Practical, Class Activity End Term- Case study , Numericals, Theory

CO4	Evaluate model quality with statistical metrics to identify best model for optimizing business strategies.	K-5 Evaluate	**0.400**	Internal- Class Test, Practical, Class Activity End Term- Case study , Numericals, Theory
CO5	Evaluate the business value of Talent Analytics to derive value propositions for organizations.	K-5 Evaluate	**0.435**	Internal- Class Test, Practical, Class Activity End Term- Case study , Numericals, Theory

Mapping COs with POs

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / POs	PO 1	PO 2	PO 3	PO 4	PO 5	CO
CO1	3	-	-	-	-	**3.0**
CO2	-	-	3	-	-	**3.0**
CO3	-	-	3	-	-	**3.0**
CO4	-	-	3	-	-	**3.0**
CO5	-	-	3	-	-	**3.0**

Contents:

1. What HR Analytics.
2. Importance of HR Analytics.
3. Translating HR metrics results into actionable business decisions for upper management
4. Workforce Planning Metrics
5. Recruitment Metrics
6. Training & Development Metrics
7. Compensation & Benefits Metrics
8. Employee relations & Retention Metrics

Session Plan

Sr.NO	Hours	Units	COs	Topics Mapped with CO	Evaluation Tools

1		**Human Resource**			
	1.25	The World of Human Resource (HR) - Human Capital Navigating through the evolution of HR Discovering the Key HR processes and defining HR Metrics	CO1	K2: Understand	Internal: Class Test, Class activity End Term: Case study, Theory
2		**Human Resource Analytics**			
	1.25	HR Analytics - the New Buzz Word Classifying HR Data Using HR Analytics in an organization / Roadmap of HR Analytics in an organization Getting Started with Analytics	CO1	K2: Understand	Internal: Class Test, Class activity End Term: Case study, Theory
3		**Technical Tool for Analytics**			
	1.25	Demonstrate the Basics of Excel and R	CO1	K2: Understand	Internals: Class Test, Class Activity, Practical, End Term: Numericals, Case study, Theory
4		**Concepts**			
	1.25	Understanding the concept of employee attrition Descriptive statistics	CO1	K2: Understand	Internals: Class Test, Class Activity, Practical, End Term: Numericals, Case study, Theory
		Case Study			
		Create and effective MIS for attrition management; understand the data			
5		**Concepts**			
	1.25	Performance management concepts Associations and indicators	CO1	K2: Understand	Internals: Class Test, Class Activity, Practical, End Term: Numericals, Case study, Theory
		Case Study			
		Company wants to analyses if the new hire performance in induction			

		can be linked to future performance on job			
6		**Concepts**			
	1.25	Appraisal Management in HR Inferential statistics and Probability	CO1 & CO3	K2: Understand & K4: Analyse	Internals: Class Test, Class Activity, Practical, End Term: Numericals, Case study, Theory
		Case Study			
		A company wants to check for appraisal results and analyses it across 2 performance cycles			
7		**Concepts**			
	1.25	Employee engagement and concepts Hypothesis testing	CO1 & CO3	K2: Understand & K4: Analyse	Internals: Class Test, Class Activity, Practical, End Term: Numericals, Case study, Theory
		Case Study			
		A Company wants to analyses engagement scores across verticals			
8		**Concepts**			
	1.25	Time series and Forecasting for HR Budgets Predictive Statistics - Time Series	CO1 & CO3 CO4 CO5	K2: Understand & K4: Analyse K5 : Evaluate	Internals: Class Test, Class Activity, Practical, End Term: Numericals, Case study, Theory
		Case Study			
		A company wants to predict costs for future planning			
9		**Concepts**			
	1.25	Employee Salary negotiations while hiring Predictive Statistics - Linear Regression Analysis	CO1 & CO3	K2: Understand & K4: Analyse	Internals: Class Activity, Practical End Term: Numericals, Case study, Theory
10		**Case Study**			

	1.25	Company wants to Predict possible salary for offer letter generation	CO1 & CO3	K2: Understand & K4: Analyse	Internals: Class Activity, Practical End Term: Numericals, Case study, Theory
11		**Concepts**			
	1.25	Attrition planning Predictive Statistics - Logistic Regression	CO1 & CO3	K2: Understand & K4: Analyse	Internals: Class Activity, Practical End Term: Numericals, Case study, Theory
12		**Case Study**			
	1.25	A company wants to predict probability of attrition	CO1 & CO3	K2: Understand & K4: Analyse	Internals: Class Activity, Practical End Term: Numericals, Case study, Theory
13		**Concepts**			
	1.25	Engagement for employee retention Associative Statistics - Principal Component Analysis	CO1 & CO3	K2: Understand & K4: Analyse	Internals: Class Activity, Practical End Term: Numericals, Case study, Theory
14		**Case Study**			
	1.25	Case study 8 - Company wants to understand what the Main Drivers / Principal Components of Engagement are	CO2	K2: Understand & K4: Analyse	Internals: Class Activity, Practical End Term: Numericals, Case study, Theory
15		**Concepts**			
	1.25	Employee programs and success Associative Statistics - Segmentation through clustering	CO3	K2: Understand & K4: Analyse	Internals: Class Activity, Practical End Term: Numericals, Case study, Theory
16		**Case Study**			
	1.25	Case study 9 - A company wants to understand the programs that different employees want	CO2 & CO3 CO4,	K2: Understand & K4: Analyse ,	Internals: Class Activity, Practical End Term:

			CO5	K5 : Evaluate	Numericals, Case study, Theory

Pedagogy
1. Lecture
2. Case Study
3. News/Article Analysis
4. Live Activity/Exercise
5. Videos

Modes of Evaluation & Examination Scheme:

Evaluation:	
Internal Assessment	20 Marks
External Assessment	30 Marks
Total	50 Marks

Internal Assessment:	
Class Attendance	5 Marks
Class Participation	5 Marks
Class Test	5 Marks
Assignment	5 Marks

External Assessment:	
End Term Examination	30 Marks

Assessment Mapping:

Parameter	**Marks**	**CO-1**	**CO-2**	**CO-3**	**CO-4**	**CO-5**
Internal	20	20%	20%	20%	20%	20%
Class Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Class Test	5	50%	50%	0%	0%	0%
Assignment	5	0%	37%	25%	13%	25%
End Term	30	20%	20%	40%	10%	10%

Text Book:

Winning on HR Analytics: Leveraging Data for Competitive Advantage 1st Edition, by Ramesh Soundararajan, Kuldeep Singh, Sage Publication.

Reference Books:

- **HR Analytics: Understanding Theories and Applications Paperback – 1 May 2017,by Dipak Kumar Bhattacharyya**
- Predictive Analytics for Human Resources (Wiley and SAS Business Series) by Jac Fitz-enz), John Mattox
- Data-Driven HR: How to Use Analytics and Metrics to Drive Performance Kindle Edition by Bernard Marr.

- **The Basic Principles of People Analytics, Learn how to drive better outcomes for your business and employees by Erik van Vulpen) and David Green .**

- **Doing HR Analytics – A Practitioner's Handbook with R Examples**

E Book:
1. HRYP Guide: Tips and advice for young HR professionals, by Ben Eubanks
2. The Rise of HR: Wisdom from 73 Thought Leaders, edited by Dave Ulrich, William A Schiemann and Libby Sartain
3. Praise for Predictive HR Analytics ,
SECOND EDITION, Edwards, Martin, and Kirsten Edwards. Predictive HR Analytics : Mastering the HR Metric, Kogan Page, Limited, 2019. ProQuest Ebook Central, http://ebookcentral.proquest.com/lib/undip-ebooks/detail.action?docID=5718930.
Created from undip-ebooks on 2021-09-29 08:23:34.

Course Code : 0210300321
Course Title : Digital analytics
Semester : II
Credit : 2
Duration : 20 hours (75 minutes per session)
Course Faculty:

Course Description

This course explains how social media tools can help organizations reach their objectives and when these tools are most appropriate for students to remember. The course helps students to understand and engage with social media tools and describe how to measure social media campaigns. The objective of the course is to study and analyse social media use by new organizations in order to evaluate and improve their own profiles on social media accounts. Use analytics to learn about community and demographics. Also, learn the importance of Web Analytics and its applications. It is intended to emphasize the importance of Web Analytical Tools as platform for creating and developing Applications.

Course Outcomes

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
After the completion of course, students should be able to				
CO 1	Describe to get an end to end perspective of the digital analytics ecosystem to plan targeted content strategies.	**K2 -Understand**	**10**	Internal Class Test End Term Theory
CO2	Sketch digital marketing strategies, identify in-demand metrics to effectively measure and optimise ROI of digital data.	**K-3 Apply**	**5.5**	Internal Assignment, Class Activity End Term Theory Case study
CO3	Examine the current use of social media its special focus on new products and organizations, to gain insights and apply analytics to social media usage data	**K-4 Analyse**	**3.5**	Internal Practical Class Activity End Term Case study

CO4	Appraise key performance metrics and leverage insights from the digital data for firm profitability aligned with business goals.	**K-5 Evaluate**	**0.5**	Internal Practical Class Activity End Term Case study
CO5	Appraise campaign performance and gain the competitive intelligence required to optimize organisations marketing campaigns to improve online customer experience.	**K-5 Evaluate**	**0.5**	Internal Assignment, Class Activity End Term Case study

Mapping COs with POs

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / POs	PO 1	PO 2	PO 3	PO 4	PO 5	CO
CO1	3	-	-	-	-	**3.0**
CO2	-	-	3	-	-	**3.0**
CO3	-	-		-	-	**-**
CO4	-	-	3	-	-	**3**
CO5	-	-	3	-	-	**3**

Course Contents:

- Introduction to Social Media; how a business can make use of Social Media.
- How to collect, store and manage social media data.
- Concepts Guiding Social Media – target audience, influencer & message.
- Blogging & Micro blogging; Customer Persona.
- Social Networks & Social Bookmarking.
- Social Media Analytics – Twitter, Facebook, etc.
- Google Ads & Analytics – How it works, Ad Auctions, Display & Search advertising.
    - Web Analytics – Knowledge discovery from web data, web analytics at e-Business scale, web scale, web spam, truth finding, web monitoring tools, web traffic & control.
- Mobile Apps Analytics.
- Data collection architecture & O2MC.
- Computational advertisement; Conversion attribution; Bidding strategies.
    - Properties of large-scale networks (degree, diameter, centrality, clustering); Page Rank and HITS.
- Sentiment analysis - How to perform sentiment analysis & get it summarized.

Session Plan

Sr.NO	Hours	Units	COs	Topics Mapped with CO	Evaluation Tools
Session 1	1.25	Introduction to Social Media; How a Business can make use of Social Media.	CO1	K2: Understand	Internal Class Test End Term Theory
Session 2	1.25	Concepts Guiding Social Media Target Audience, Influencer and Message Blogging & Micro blogging.	CO1	K2: Understand	Internal Class Test End Term Theory
Session 3 & 4	2.5	Mobile App Analytics, Customer Persona & Social Networks Bookmarking.	CO1	K2: Understand	Internal Class Test End Term Theory
Session 5 & 6	2.5	Social Media Analytics – Twitter, Facebook, etc.; How to collect, store and manage social media data.	CO1&CO2	K2: Understand & K3: Apply	Internal Class Test, Assignment End Term

					Theory, Case Study
Session 7 & 8	2.5	Google Ad & Analytics – How it works (search & display), Ad auction.	CO1&CO2	K2: Understand & K3: Apply	Internal Class Test, Assignment End Term Theory, Case Study
Session 9 & 10	2.5	Web Analytics (e-Business scale) Web Monitoring Tools, Web Traffic & Control and Knowledge discovery from web data.	CO1&CO2	K2: Understand & K3: Apply	Internal Class Test, Assignment End Term Theory, Case Study
Session 11	1.25	Data collection architecture; O2MC & Typical problem formulations.	CO3	K4: Analyse	Internal Assignment End Term Case Study
Session 12	1.25	Computational advertisement; Bidding strategies; Conversion attribution.	CO1	K2: Understand	Internal Class Test End Term Theory
Session 13	1.25	Properties of large-scale networks (degree, diameter, centrality, clustering); Page Rank and HITS; Web Spam, truth finding.	CO2	K3: Apply	Internal Assignment End Term Theory, Case Study
Session 14	1.25	How to perform sentiment analysis and get it summarized.	CO3	K4: Analyse	Internal Assignment ,Class Activity End Term Case Study
Session 15 & 16	2.5	Final Presentation.	CO2 & CO3 & CO4 , CO5	K3: Apply, K4: Analyse & K5: Evaluate	Internal Assignment, Class Activity End Term

					Theory, Case Study

Pedagogy
1. Lecture
2. Case Study
3. News/Article Analysis
4. Live Activity/Exercise
5. Videos

Modes of Evaluation & Examination Scheme:

Evaluation:	
Internal Assessment	20 Marks
External Assessment	30 Marks
Total	50 Marks

Internal Assessment:	
Class Attendance	5 Marks
Class Participation	5 Marks
Class Test	5 Marks
Assignment	5 Marks

External Assessment:	
End Term Examination	30 Marks

Assessment Mapping:

Parameter	Marks	CO-1	CO-2	CO-3	CO-4	CO-5
Internal	20	31%	39%	11%	9%	11%
Class Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Class Test	5	50%	50%	0%	0%	0%
Assignment	5	0%	37.50%	25.00%	12.50%	25%
End Term	30	25%	15%	45%	15%	0%

Text Book:
Internet Marketing: Moutusy Maity, Oxford Publication

Reference books:
1. Social Media Marketing All -in-one for dummies (ebook), Jan Zimmerman Doug Shalin.
2. Introduction to Information Systems, Alexis Leon and Mathews Leon by TMH.
3. Internet for Everyone, Alexis Leon and Mathews Leon, Vikas Publishing House.
4. Information Systems Today, Leonard Jessup and Joseph Vallacich, PHI Learning.

E-Books:

1. https://www.pauladaunt.com/books/Social%20Media%20Marketing.pdf
2. https://www2.clarku.edu/offices/its/webservices/pdf/web_analytics.pdf
3. https://www.tutorialspoint.com/web_analytics/web_analytics_tutorial.pdf

Course Code : **0210300322**
Course Title : **Analytical Tools**
Semester : **II**
Credit : **2**
Duration : **20 hours (75 minutes per session)**
Course Faculty :
Course Description

This course is designed to give theory and practical knowledge in data management and big data analytics. Hadoop is an open-source framework that allows to store and process big data in a distributed environment across clusters of computers using simple programming models. Map Reduce is a programming paradigm that runs in the background of Hadoop to provide scalability and easy data-processing solutions. The curriculum will enable the students learn the concepts of Big Data Analytics using Hadoop Framework also they will learn to use the features of Map Reduce and how it works to analyse Big Data. It covers the basics of big data, as well as the Extraction, Transformation and Loading process of big data using the Hadoop and Map Reduce technology; thus enabling the students to learn how data is being collected and stored at a velocity faster than ever and how it is managed. The pedagogy is through practical, assignments, theory & practical lectures, and case studies.

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
After the completion of course, students should be able to				
CO 1	Explain how big data is organised, analysed, and interpreted to drive better business decisions.	**K2 -Understand**	**10**	Internal Test, Presentation End Term- Theory
CO2	Implement…Hadoop Distributed File System (HDFS) commands to design distributed systems that manage "big data" using Hadoop and related technologies.	**K-3 Apply**	**4.75**	Internal Class test ,Assignments End Term- Theory , Case Study, Numericals
CO3	Execute tremendous datasets stored in the HDFS, and use distributed, reliable, and available service for data ingestion.	**K-3 Apply**	**4.00**	Internal Class test ,Assignments End Term- Theory, Case Study,Numericals

CO4	Examine map reduce application by performing testing and debugging to review and resolve common performance problems.	**K-4 Analyse**	**1.00**	Internal Class test ,Assignments End Term- Theory, Case Study, Numericals
CO5	Defend Job Execution in Hadoop Environment to develop Big Data Solutions.	**K-5 Evaluate**	**0.25**	Internal Class test ,Assignments End Term- Theory, case Study, Numericals

Mapping COs with POs

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / Pos	PO 1	PO 2	PO 3	PO 4	PO 5	CO
CO1	3	-	-	-	-	**3.0**
CO2	-	-	3	-	-	**3.0**
CO3	-	-	3	-	-	**3.0**
CO4	3	-	-	-	-	**3.0**
CO5	-	-	3	-	-	**3.0**

Contents:

- Overview of Big Data
- Using Big Data in Businesses
- Technologies for Handling Big Data
- Understanding Hadoop Ecosystem
- Dig Deep to understand the fundamental of Map Reduce and HBase
- Understanding Big Data Technology Foundations
- Data loading Techniques
- Using Hadoop to store data
- Learn to Process Data using Map Reduce
- Testing and Debugging Map Reduce Applications

SESSION PLAN:

Sr.NO	Hours	Units	COs	Topics Mapped with CO	Evaluation Tools
Session 1	1.25	**Overview of Big Data** History of big data Big Data Elements Career Opportunities Big Data advantages & disadvantages	CO1	K2 -Understand	Internal Test, Presentation End Term- Theory
Session 2	1.25	**Using Big Data in Businesses** Application perspective of Big Data big data in marketing, analytics, retail, hospitality, consumer good, Défense etc.	CO1	K2 -Understand	Internal Test, Presentation End Term- Theory
Session 3	1.25	Technologies for Handling Big Data Introduction to Hadoop Functioning of Hadoop Cloud Computing (features, advantages, applications) etc	CO1	K2 -Understand	Internal Test, Presentation End Term- Theory
Session 4	1.25	Understanding Hadoop Ecosystem Hadoop and its ecosystem HDFS MapReduce YARN HBase Hive Pig Sqoop Zookeeper Flume Oozie	CO2 , CO3	K3 -Apply	Internal Assignment End Term- Theory , case study,numericals
Session 5	1.25	Internal Evaluation I	CO1, CO2,CO3	K2 -Understand K3- Apply	Internal Test, Presentation Assignment End Term- Theory , case

					study,numericals
Session 6	1.25	Dig Deep to understand the fundamental of Map Reduce and HBase Framework of Map Reduce Uses of Map Reduce	CO2, CO3	K3 -Apply	Internal Assignment End Term- Theory , case study,numericals
Session 7	1.25	Big Data Technology Foundations Big data stack - Data source layer, ingestion layer, source layer, security layer, visualization layer, visualization approaches etc.	CO1	K2 -Understand	Internal Test, Presentation End Term- Theory
Session 8 & 9	2.5	Data loading Techniques Databases, Polygot persistence and their related introductory knowledge	CO1	K2 -Understand	Internal Test, Presentation End Term- Theory
Session 12 & 13	2.5	Internal Evaluation II	CO1, CO2 , CO3	K2 -Understand K3- Apply	Internal Test, Presentation Assignment End Term- Theory , case study,numericals
Session 10 & 11	2.5	Using Hadoop to store data Entire module of HDFS, HBase and their respective ways to store and manage data along with their commands.	CO2 , CO3	K3 -Apply	Internal Assignment End Term- Theory , case study,numericals

Session 14 & 15	2.5	Learn to Process Data using Map Reduce Developing simple Map Reduce framework and the concepts applied to it.	CO2,CO3	K3 -Apply	Internal Assignment End Term- Theory , case study,numericals
Session 16	1.25	Testing and Debugging Map Reduce Applications	CO4 ,CO5	K4 -Analyse, K5- Evaluate	Internal Assignment End Term- Theory , case study,numericals

Pedagogy
1. Lecture
2. Case Study
3. News/Article Analysis
4. Live Activity/Exercise
5. Videos

Modes of Evaluation & Examination Scheme:

Evaluation:	
Internal Assessment	20 Marks
External Assessment	30 Marks
Total	50 Marks

Internal Assessment:	
Class Attendance	5 Marks
Class Participation	5 Marks
Class Test	5 Marks
Assignment	5 Marks

External Assessment:	
End Term Examination	30 Marks

Assessment Mapping:

Parameter	**Marks**	**CO-1**
Internal	20	31%
Class Attendance	5	20%
Class Participation	5	20%
Class Test	5	50%

Assignment	5	0%
End Term	30	20%

Text Books:
Big Data: Black Book, DT Editorial Services, Vikash Kuman Choudhary, Dreamtech Press.
Reference Books
1. Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses, Michael Minelli, Michele, Chambers, Ambiga Dhiraj, ISBN: 978-1-118-14760-3 224 pages January 2013
2. Big Data: A Revolution That Will Transform How We Live, Work and Think [Paperback], Viktor Mayer-Schonberger, (Author), Kenneth Cukier, (Author)

E- Books / On-line Materials
https://www.businessprocessincubator.com/content/full-big-data-analytics-course-syllabus/

1. Big data analytics
- http://javaarm.com/file/apache/Hadoop/books/Big.Data.Analytics.with.R.and.Hadoop_Vignesh.Prajapati_2013.pdf

2. Guide to big data analytics - https://www.datameer.com/pdf/big-data-analytics-ebook.pdf?mkt_tok

3. Big data - https://www.planet-data.eu/sites/default/files/presentations/Big_Data_Tutorial_part4.pdf

4. Big data white book - http://www.fujitsu.com/in/Images/WhiteBookofBigData.pdf

5. Big data analytics
- ftp://public.dhe.ibm.com/software/pdf/at/SWP10/Big_Data_Analytics.pdf

6. Data science and big data - http://www.csis.pace.edu/~ctappert/cs816-15fall/books/2015DataScience&BigDataAnalytics.pdf

7. Understanding big data
- https://www.immagic.com/eLibrary/ARCHIVES/EBOOKS/I111025E.pdf

8. Big data for dummies - http://eecs.wsu.edu/~yinghui/mat/courses/fall%202015/resources/Big%20data%20for%20dummies.pdf

9. Big data analytics infrastructure - http://www.asiandatascience.com/wp-content/uploads/2017/10/XBM03004USEN-BD-A-for-dummies.pdf

10. Big data tutorial - https://www.planet-data.eu/sites/default/files/presentations/Big_Data_Tutorial_part4.pdf

Course Code : **0210300315**
Course Title : **Introduction to Machine Learning**
Semester : **II**
Credit : **4**
Duration : **40 hours (75 minutes per session)**

Course Description

This course will introduce the learner to the concepts of machine learning which is a must-have skill for all aspiring data analysts and data scientists, or anyone else who wants to wrestle all that raw data into refined trends and predictions. It will make students understand the basics of Machine learning, brings together computer science and statistics to harness that predictive power. Students will learn the application of end-to-end process of investigating data through a machine learning lens. It also includes analyses of case studies on organizations that successfully deployed these techniques, how to use data to develop insights. It will cover tools and techniques to extract and identify useful features that best represent your data, a few of the most important machine learning algorithms, and how to evaluate the performance of your machine learning algorithms. This course is created to give theory and practical exposure in the ways in which businesses can use data to gain insights and make better decisions.

Course Outcomes

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
After the completion of course, students should be able to				
CO1	Discuss scope of machine learning to get an overview of its history, important definitions, applications and concerns within businesses.	K2: Understand	**19**	Internal Quiz,Test End Term- Theory
CO2	Implement concepts of supervised and unsupervised machine learning concepts to real time problems for improving the speed, reliability, and quality of decisions in businesses.	K3: Apply	**7**	Internal- Practicals , Project ,and Presentation End Term- Theory,Case Study
CO3	Analyse real time problems by developing, testing and applying predictive algorithms to review the data and come up with insights.	K4: Analyse	**9**	Internal- Practicals, Project Report and Presentation End Term- Case Study

CO4	Judge performance of machine learning models with various performance metrics to cope up with the futuristic challenges and competitions in business.	K5: Evaluate	**1**	Internal- Assignment End Term- Case Study
CO5	Appraise the business value of machine learning model to derive value propositions for organizations.	K5: Evaluate	**4**	Internal- Assignment End Term- Case Study

Mapping COs with POs

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / Pos	PO 1	PO 2	PO 3	PO 4	PO 5	CO
CO1	3	-	-	-	-	**3.0**
CO2	-	-	3	-	-	**3.0**
CO3	-	-	3	-	-	**3.0**
CO4	-	-	3	2	-	**2.5**
CO5	-	-	3	-	-	**3.0**

Course Contents:

- Introduction to Machine learning.
- Introduction to Descriptive Statistics
- Probability and probability distributions
- Introduction to Inferential statistics
- Statistical estimation
- Test of Hypothesis
- Introduction to Linear Regression
- Implementing linear regression with SKICIT learn.
- Introduction to Regularization and Gradient Descent.
- Cross Validation & Hyper parameter tuning.
- Applying Lasso and Ridge with the data set
- Introduction to Feature Selection
- Wrapper and Embedded methods
- EDA & data Processing
- Cost functions and Linear Regression.
- Evaluation Metrics for classification.
- Project.

Session Plan:

Sr. No	Hrs	Units	Cos	Topics Mapped with CO	Evaluation Tools
BASIC- DESCRIPTIVE STATISTICS					
1		**Introduction to Machine Learning**			
(i)		Welcome to Machine Learning Supervised Learning Unsupervised Learning Structured Data vs Unstructured Data	CO1	1.25	Internal Test End Term-Theory
2		**Measures of Central Tendency**			
(i)		Mean Median Mode IQR (Inter Quartile Range) Outliers	CO1	1.25	Internal Test End Term-Theory
3		**Measures of Dispersion**			
(i)		Range Standard Deviation Mean Absolute Deviation Coefficient of Variation Box Plot Skewness and Kurtosis	CO1	1.25	Internal Test End Term-Theory
4		**Correlation**			
(i)		Defining Correlation Types of Correlation Coefficients Correlation Visualized Interpretation using Heat Map	CO1	1.25	Internal Test End Term-Theory
5		**Introduction to Probability**			
(i)		What is probability Types of events Properties of Probability Set theory	CO1	1.25	Internal Test End Term-Theory
6		**Conditional Probability and Bayes Theorem**			
(i)		Conditional Probability Bayes Theorem	CO1	1.25	Internal Test End Term-Theory
7		Probability Distribution			
(i)		Random Variable	CO1	1.25	Internal

		Probability Distribution Binomial Distribution Normal Distribution Standard Normal Distribution Visualization			Test End Term-Theory
8		Probability with Real data set			
(i)		House and Loan prediction data set with real time case studies and samples	CO2	1.25	Internal-Project Report and Presentation End Term-Case Study
9		**Introduction to Inferential Statistics**			
(i)		What is Inferential Statistics Making Inference from Data	CO1 CO2	1.25	Internal Test, Project Report and Presentation End Term-Theory, Case Study
10		**Statistical Elimination**			
		Central Limit Theorem Variance and Degrees of Freedom Point Estimates Interval Estimates Visualization of Intervals	CO1	1.25	Internal Test End Term-Theory
11		**Test of Hypothesis**			
		What is Hypothesis Testing Process of Hypothesis Testing P values Errors in Hypothesis Testing T Test Chi Squared Test Power test	CO1	1.25	Internal Test End Term-Theory
12		**Project**			
		Making Inference with Banking Data	CO2	1.25	Internal-Project Report and Presentation End Term-Case Study
13		**Introduction to Linear Regression**			
		What is Linear Regression Need for Linear Regression Assumptions of Linear Regression	CO1	1.25	Internal Test End Term-

		Cost Function Simple Linear Regression			Theory
14		**Ordinary Least Squares**			
		Least Square Techniques Mathematics of OLS OLS Visualized Discrete Examples to OLS	CO1	1.25	Internal Test End Term-Theory
15		**Implementing Linear Regression with Skicit Learn**			
		Model Building with Scikit Learn Mean Absolute Error Root Mean Squared Error R square	CO2	1.25	Internal-Project Report and Presentation End Term-Case Study
16		**Project**			
		Make First prediction with Linear Regression	CO2, CO3, CO5	1.25	Internal-Project Report and Presentation, Assignment End Term-Case Study
ADVANCED- INFERENTIAL STATISTICS					
17		**Regularization**			
		Introduction to Gradient Descent Intuition behind Gradient Descent Iterative Approach to find minimum Learning Rate, Feature Scaling	CO1, CO3	1.25	Internal Test, Project Report and Presentation End Term-Theory, Case Study
18		**Why regularization**			
		Polynomial Features Bias Variance Trade off Model Complexity Effects of training data size	CO1, CO2,CO3,	1.25	Internal Test, Project Report and Presentation, Assignment End Term-Theory, Case Studies
19		**What is Regularization**			
		Introduction L1 (Lasso) Regularization L2 (Ridge) Regularization L1 vs L2	CO1,CO3	1.25	Internal Test, Project Report and Presentation End Term-

					Theory, Case Study
20		**Cross Validation and Hyperparameter tuning**			
		Need for Cross Validation Holdout Method Hyper parameter tuning Cross Validation strategies	CO1,CO3	1.25	Internal Test, Project Report and Presentation End Term-Theory Case Study
21		**Project**			
		Applying Lasso and Ridge with the data set	CO1,CO2	1.25	Internal Test, Project Report and Presentation End Term-Theory, Case Study
22		**Introduction to Feature Selection**			
		What is Feature Selection Co relation Coefficient Chi Squared Test	CO1	1.25	Internal Test End Term-Theory
23		**Wrapper and Embedded methods**			
		Wrapper Method Embedded Method Principal Component Analysis and Implementation	CO3	1.25	Internal Project Report and Presentation End Term-Case Study
24		**Summary of Feature Selection**			
		Summarization of the above methods Feature selection checklist	CO2,CO3	1.25	Internal Project Report and Presentation End Term-Case Study
25		**Project**			
		Features selection on the real time weather data or any banking data	CO5	1.25	
26		**EDA and Data Preprocessing**			
		Why Data Cleaning Data Preprocessing and Data Exploration Outlier Detection Treatment of Outlier Detecting Missing Data	CO1, CO2, CO3	1.25	Internal Test, Project Report and Presentation End Term-

		Handling Missing Data			Theory, Case Study
27		**Data Transformation**			
		Transformation to reduce skewness Standardizing and Normalizing variables Encoding Categorical data	CO1	1.25	Internal Test End Term-Theory
28		**Project**			
		Data preprocessing and cleaning data on the loan set data	CO2, CO3	1.25	Internal Test, Project Report and Presentation End Term-Theory, Case Study
29		**Cost Function**			
		Cost Function for Linear Regression Intuition behind Cost Function Model Building	CO2, CO3, CO4, CO5	1.25	Internal Test, Project Report and Presentation End Term-Theory, Case Study
30		**Evaluation Metrics for Classification**			
		Confusion Matrix Accuracy Score Precision Recall and Fscore ROC-AUC SCORE	CO3, CO4	1.25	Internal Test, Project Report and Presentation End Term-Theory, Case Study
31 & 32		**Project**			
		Data set for Insurance claim prediction	CO5	2.5	Internal Assignment End Term-Case Study

Pedagogy

1. Lecture
2. Case Study
3. News/Article Analysis
4. Live Activity/Exercise

5. Videos

Assessment Criteria:

Evaluation:	
Internal Assessment	40 Marks
External Assessment	60 Marks
Total	100 Marks

Internal Assessment:	
Class Attendance	5 Marks
Class Participation	5 Marks
Class Test	10 Marks
Assignment	10 Marks
Project	10 Marks

External Assessment:	
End Term Examination	60 Marks

Assessment Mapping:

Parameter	**Marks**	**CO-1**	**CO-2**	**CO-3**	**CO-4**	**CO-5**
Internal	40	31%	25%	20%	12%	12%
Class Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Class Test	10	50%	50%	0%	0%	0%
Assignment	10	0%	0%	38%	31%	31%
Project	10	50%	50%	0%	0%	0%
End Term	60	25%	35%	5%	20%	15%

Text book:

Ethem Alpaydin, Introduction to Machine Learning, Second Edition ,
http://mitpress.mit.edu/catalog/item/default.asp?ttype=2&tid=12012

Reference Books:

28. Stephen Marsland, Machine Learning: An Algorithmic Perspective. http://www.amazon.com/Machine-Learning-Algorithmic-PerspectiveRecognition/dp/1420067184 .
29. Christopher M. Bishop, Pattern Recognition and Machine Learning. http://research.microsoft.com/en-us/um/people/cmbishop/prml/. • Tom Mitchell, Machine Learning, http://www.cs.cmu.edu/~tom/mlbook.html.
30. Tom Mitchell, Machine Learning, http://www.cs.cmu.edu/~tom/mlbook.html.

E-Books:

12. https://www.cs.huji.ac.il/~shais/UnderstandingMachineLearning/understanding-machine-learning-theory-algorithms.pdf

13. http://alex.smola.org/drafts/thebook.pdf

Course Title : NGO Internship
Semester : II
No. of Credit : 2
Duration : 20 hrs.

Program Objectives:

1) Apply knowledge of management theories and practices to solve business problems.
2) Foster Analytical and critical thinking abilities for data-based decision making.
3) Ability to develop Value based Leadership ability.
4) Ability to understand, analyse and communicate global, economic, legal, and ethical aspects of business.
5) Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment.

Course Outcomes

Course Outcome: NGO Internship (0206300801)			
Course Outcomes	**After the completion of course, students should be able to**	**Cognition**	**Remarks**
0206300801.1	Build an understanding of the role of NGO in social welfare and development	Understanding	
0206300801.2	Apply management concepts and tools to help the poor and underprivileged communities	Applying	
0206300801.3	Develop the skills needed to assist organizations in creating and implementing socially responsible projects	Creating	

Mapping COs with POs

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

CO Code	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
0206300801.1	3	2	3	2	-
0206300801.2	3	3	3	2	2
0206300801.3	1	1	2	2	3
PO Attainment 0206300801	3.3	2	2.6	2	2.5

Evaluation: Total 50 marks

Faculty Guide	10 Marks
NGO Guide	20 Marks
Poster Presentation and Viva	20 marks
TOTAL	**50 marks**

Course Title: Managerial Communication - 2

Semester : II

Credit: 2

Duration: 20 hrs

Course Description:

This course is designed to cover the various aspects of verbal and non-verbal communication through the speaking circle and help students gain a sound knowledge of communication practices and understand ways of applying these skills in the future roles they hope to play in the organization. Along with an appropriate mix of theory and practical examples, the topics are dealt with the help of role plays, PowerPoint presentations, and instructional videos. At the end of the course, the students will be able to learn and practice effective emotional intelligence and critical thinking. They would be able to display empathy at work and improve teamwork and improve professional relationships. The course also aims to enhance their ability to analyse multiple perspectives and arrive at better decision making.

Contents:

10. Emotional intelligence
11. Critical Thinking with 6 thinking hats
12. The Speaking Circle
13. Students Presentation

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
CO1	Outline the concept of six thinking hats to brainstorm multiple perspectives and arrive at better decision making.	K2: Understand	6.0	Internal Assignment, Class test End Term- Case Study
CO2	Apply elements of quick thinking to brainstorm ideas quickly and come across as a more	K3: Apply	2.5	Internal- Practical, Class Test End Term- Case Study /

	confident speaker			Short Note
CO3	Describe ways to create and maintain the impression of credibility, power, and efficiency during business presentations.	K3: Apply	14	Internal- Presentation End Term- Case Study
CO4	Apply elements of public speaking creatively to deliver ted talks picture story telling, news discussions	K3: Apply	2.5	Internal- Class Test, Case Study End Term- Theory
CO5	Analyse the concepts and techniques of emotional intelligence to resolve personal and workplace problems.	K4: Analyse	2.5	Internal- Class Test, Case Study End Term- Theory

The CO – PO Correlation matrix for the subject is given below:

1 – Low, 2 – Medium, 3 – High, 0 – Low

CO Code	PO1	PO2	PO3	PO4	PO5
CO 1	3	3	3	3	1
CO 2	1	3	3	3	1
CO 3	1	3	1	3	
CO4		3	1	3	
CO5	1	3	3	3	3
CO5	**1.5**	**3**	**22**	**3**	**1.66**

Session Plan

Session	Topics	Topic Mapped with CO	Cognition
2	Critical Thinking with 6 Thinking Hats	CO1 CO2	Apply Analyse
2	Emotional Intelligence	CO2	Analyse

4	Student Presentations		
8	The Speaking Circle 16. News Room 17. Make a Ted 18. Questions Battle 19. Picture Storytelling 20. Story Chain		

Pedagogy
1. Lecture
2. Case Study
3. News/Article Analysis
4. Live Activity/Exercise
5. Videos

Evaluation:	
Internal	40%
External	60%
Total	100%

Parameters of Internal Assessment:

(10) Attendance
(11) Class Participation
(12) Students Presentation

Assessment Mapping

Parameter	Marks	CO 1	CO 2	CO 3	CO 4	CO 5
Internal	20	10%	30%	30%	10%	20%

Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Presentation	10		25%	25%	25%	25%
End Term	**30**	**10%**	**25%**	**25%**	**20%**	**20%**

Text Book:

1) Study material to be given by the resource person.

Reference Books:

Business Communication
(Connecting At work) - Hory Sankar Mukerjee. 1st Ed.,Oxford
Technical Communication - Meenakshi Raman & Prakash SIngh, Oxford University Press, 2010

Course code:

Semester: **II**

Course Title: **Advance Excel**

No of Credits: **2**

Contact Hours: **20 hrs (75 minutes per session)**

Course Faculty: **Prof. Gayatri Sheth**

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
CO1	**Understand** custom sorting techniques, identifying and removing duplicate entries	K2: Understand	2.0	Internal Test, Practical, Project Presentation
CO2	**Compute** financial, logical, database and statistical, lookup and nesting of formulae on databases.	K3: Apply	10.0	Internal Test, Practical, Project Presentation

CO3	**Analyze** data using various features under Data Validation and 'What If' analysis .	K4: Analyze	3.0	Internal Test, Practical, Project Presentation End Term- Test
CO4	**Infer** reports using pivot tables and slicers. **Infer** dashboards for effective report creation.	K4: Analyze	3.5	Internal Test, Practical, Project Presentation End Term- Test
CO5	**Examine** Macros using VB script	K4: Analyze	1.5	Internal Test, Practical, Project Presentation End Term- Test

Mapping COs with POs

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / Pos	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	1	1	1	-	-
CO2	2	2	3	-	1
CO3	1	2	3	-	1
CO4	1	2	3	-	1
CO5	1	-	1	-	-
CO	**1.2**	**1.75**	**2.2**	**-**	**1.0**

Session Plan

Sr. No	Hrs	Units	Cos	Topics Mapped with CO	Evaluation Tools

1	**2.0**	**Working with Excel List functions**			
(i)	2.0	Sorting a List Using Single Level Sort Sorting a List Using Multi-Level Sorts Using Custom Sorts in an Excel List Filter an Excel List Using the AutoFilter Tool Creating Subtotals in a List Format a List as a Table Using Conditional Formatting to Find Duplicates Removing Duplicates	CO1: **Understand**	K2: Understand	Internal Test, Practical, Project Presentation
2	**3.0**	**Excel Database and Statistical formulae**			
(i)	**1.5**	Database formulae: ❒ Excel Function: DSUM() ❒ Excel Function: DAVERAGE() ❒ Excel Function: DCOUNT() ❒ Excel Function: DCOUNTA() ❒ Excel Function: DMAX() ❒ Excel Function: DMIN()	CO2: **Compute**	K3: Apply	Internal Test, Practical, Project Presentation
ii)	**1.5**	Statistical formulae ❒ Using Excel's IF() Function ❒ Using Excel's COUNTIF() Function ❒ Using Excel's COUNTIFS() Function ❒ Using Excel's AVERAGEIF() Function ❒ Using Excel's AVERAGEIFS() Function ❒ Using Excel's SUMIFS() Function ❒ Using Excel's SUMIF() Function	CO2: **Compute**.	K3: Apply	Internal Test, Practical, Project Presentation

3	**3.0**	**Excel Logical and Financial formulae**			
(i)	1.0	Logical formulae • Using Excel's IF() Function • Nesting Excel's IF() with AND() Function • Nesting Excel's IF() with OR() Function	CO2: **Compute**	K3: Apply	Internal Test, Practical, Project Presentation
(ii)	2.5	Financial formulae • Using Excel's FV() and PV() Function • Using Excel's RRI() with PMT() Function • Using Excel's NPV() with IRR() Function	CO2: **Compute**	K3: Apply	Internal Test, Practical, Project Presentation
4	**4.0**	**Working with Excel's Lookup Functions**			
(i)	4.0	❒ Using Excel's VLOOKUP() Function ❒ Using Excel's HLOOKUP() Function ❒ Using Excel's INDEX() and MATCH() OFFSET() and CHOOSE() Functions ❒ Nested VLOOKUP() ❒ VLOOKUP() using MATCH() and INDEX()	CO2: **Compute**	K3: Apply	Internal Test, Practical, Project Presentation
5	**1.5**	**Data Validation In Excel**			
(i)	1.0	Data Validation using Indirect() Creating a Validation List Adding a Custom Validation Error Department Specific Formulae	CO3: **Analyze**	K4: Analyze	Internal Test, Practical, Project Presentation End Term- Test
6	**1.5**	**Mastering Excel's "What If?" Tools**			
(i)	1.5	14. Working with Excel's Goal Seek Tool	CO3: **Analyze**	K4: Analyze	Internal Test,

		15. Working with Excel's Solver Tool 16. Building Effective Data Tables in Excel 17. Analysing Scenario's in Excel	.		Practical, Project Presentation End Term- Test
7	**3.5**	**Excel Pivot Tables, Pivot Charts, and working on Dashboard**			
(i)	2.5	10. Working with Excel PivotTable 11. Modifying Excel PivotTable Calculations 12. Grouping PivotTable Data 13. Formatting PivotTable Data 14. Drilling Down into PivotTable Data 15. Working with Pivot Charts 16. Filtering PivotTable Data	CO4:**Infer**	K4: Analyze	Internal Test, Practical, Project Presentation End Term- Test
(ii)	1.0	17. Filtering with the Slicer Tool 18. Working with Dashboard using the above tool.	CO4:**Infer**	K4: Analyze	Internal Test, Practical, Project Presentation End Term- Test
8	**1.5**	**Microsoft Excel Macros and VBA**			
(i)	1.5	❒ Working with Excel Macros ❒ Activating the Developer Tab in Excel ❒ Working with the Macro Recorder ❒ Editing a Macro with VBA ❒ Working Buttons to run Macros	**CO5: Examine**	K4: Analyze	Internal Test, Practical, Project Presentation End Term- Test

Pedagogy

21. Lecture
22. Test

23. Project Presentation

Continuous Evaluation-50 Marks

Parameters of Internal Assessment:

- Attendance-5 Marks
- Class Participation-5 Marks
- MCQ-10 Marks
- Project-10 Marks
- Viva-5 Marks
- Case Study Based Questions-15 Marks

Assessment Mapping

Parameter	Marks	CO 1	CO 2	CO 3	CO 4	CO 5
Internal	20	21%	24%	22%	18%	15%
Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Project-1	5	10%	30%	30%	20%	10%
Project-2	5	10%	30%	30%	20%	10%
End Term	**30**	**15%**	**40%**	**15%**	**30%**	**-**

Reference Book:

Book Title	Name of Author	Publisher	Edition No.	Year
Excel 2013 P ower Programming with VBA	John Walkenbach	Wiley & Sons, Incorporated, John	-	2007
Excel 2016 Power Programming with VBA	Michael Alexander Dick,Kusleika	Wiley	1st	2016

E-Books:

Book Title	Name of	Publisher	Link	Year

	Author			
Microsoft Word 2013™ An Essential Guide (Level 1)	-	. reading.ac.uk	http://www.reading.ac.uk/web/files/its/WordEssen13.pdf	2014
Corporate Finance Institute-Excel	-	Corporatefinanceinstitute.com	https://corporatefinanceinstitute.com/resources/ebooks/excel-book-pdf/	2013

Course Title : Verbal Skills and Quantitative Analysis - 2

Semester : II

Credit : 2

Duration : 20 hrs

Course Description

This course is designed to cover the basics of Arithmetic and Reasoning and to build a good hold on concepts for students which will prepare them for questions asked in the Placement Aptitude Tests. Each module will cover important topics from Quants and Reasoning, focusing on building a strong foundation on the topics. The course is divided into 10 parts, each part covering an important module from the arithmetic section. Apart from training in classes, they will be solving 300+ questions in total, during the sessions, which will confirm their progress.

Contents

31. Time, Speed and Distance
32. Time and Work
33. Data Interpretation
34. Mensuration
35. Clocks and Calendars
36. Syllogism and Venn Diagrams
37. Logical Reasoning: Linear Arrangements
38. Logical Reasoning: Circular Arrangements
39. Logical Reasoning: Matrix Arrangements
40. Advanced Tenses
41. Advanced Prepositions
42. Sentence Completion Questions
43. Para jumbles

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
CO1	**Understand Rules of** Tenses & Prepositions to solve sentence completion & correction questions	**L2 -Understand**	**2.5**	Internal Test,
CO2	**Understand** the patterns of clocks, calendars and venn diagrams to encourage higher order thinking.	**L2 -Understand**	**4**	Internal Test,
CO3	**Apply** short cut techniques and strategies to correctly answer parajumbles & sentence completion	**L3 - Apply**	**2.5**	Internal Test,
CO4	**Apply** tricks and short-cuts to solve mathematical problems in the easiest and the fastest manner.	**L3 - Apply**	**6**	Internal Test,
CO5	**Analyze** the given data logically to enhance the problem-solving ability.	**L4 - Analyse**	**5**	Internal Test,

The CO – PO Correlation matrix for the subject is given below:

1 – Low, 2 – Medium, 3 – High, 0 – Low

CO Code	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	1	3	1	1	1
CO2	-	3	-	2	1
CO3	1	3	-	-	-
CO4	1	3	-	1	2
CO5	1	3	-	1	1
CO					

Session Plan

Session	Hours	Topics	Topic Mapped with CO	Cognition	Evaluation Tool
1	1.25 hours	Advanced Tenses	CO5: Apply rules of grammar and deduction techniques to solve grammatical portion in placement process	Understand	Internal Test,
2	1.25 hours	Advanced Prepositions	CO5: Apply rules of grammar and deduction techniques to solve grammatical portion in placement process	Understand	Internal Test,
3	1.25 hours	Sentence Completion Questions	CO5: Apply rules of grammar and deduction techniques to solve grammatical portion in placement process	Apply	Internal Test,
4	1.25 hours	Para jumbles	CO5: Apply rules of grammar and deduction techniques to solve grammatical portion in placement process	Apply	Internal Test,
5-6	2.5	Time Speed and Distance: Basics, Unit Conversions, Average and relative speed, late and early arrivals, problems on trains, boats & streams	CO1-Apply tricks and short-cuts to solve mathematical problems in the easiest and the fastest manner.	Apply	Internal Test,
7-8	2.5	Time and Work: Efficiency, Man- Days,	CO1-Apply tricks and short-cuts to solve mathematical problems in the easiest and the fastest	Apply	Internal Test,

		pipes and cisterns	manner.		
9	1	Mensuration: Areas and Perimeters of 2 Dimensional figures, Basic concepts of 3 Dimensional figures	CO1-Apply tricks and short-cuts to solve mathematical problems in the easiest and the fastest manner.	Apply	Internal Test,
10	1	Logical Reasoning: Linear Arrangements	CO5- Analyze the given data logically to enhance the problem solving ability.	Analyze	Internal Test,
11	1.5	Logical Reasoning: Circular Arrangements	CO5- Analyze the given data logically to enhance the problem solving ability.	Analyze	Internal Test,
12	1.5	Logical Reasoning: Matrix Arrangements	CO5- Analyze the given data logically to enhance the problem solving ability.	Analyze	Internal Test,
13	1	Data Interpretation: Problems based on bar graphs, pie charts, line graphs etc.,	CO5- Analyze the given data logically to enhance the problem solving ability.	Analyze	Internal Test,
14	1.5	Clocks and Calendars: Basic Concepts, angles between the minute and the hour hand, faulty clocks, mirror image time, ordinary year, leap year, odd days, decoded day of the week	CO2- Understand the patterns of clocks, calendars, Venn diagrams to encourage higher order thinking.	Understand	Internal Test,

15-16	2.5	Syllogism and Venn Diagrams: Concepts, Tricks and Questions	CO2- Understand the patterns of clocks, calendar, and Venn diagrams to encourage higher-order thinking.	Understand	Internal Test,

Pedagogy
1. Lecture
2. Practice exercises

Parameters of Internal Assessment:
1. Class Test
2. Class Participation
3. Attendance

Assessment Mapping

Parameter	**Marks**	**CO 1**	**CO 2**	**CO 3**	**CO 4**	**CO 5**
Attendance	10	20%	20%	20%	20%	20%
Class Participation	10	30%	20%	20%	10%	20%
Class Test 1 Quants	10	50%	50%			
Class Test 2 Quants	**10**			**50%**	50%	
Class Test Verbal	**10**					**100%**

Reference Book:
R.S. Agarwal - First Edition: 1989
Uma Maheshwari- GACP - First Edition: 2017
For verbal ability, study material would be provided by the respective faculty

Course Code : 300314

Course Title : Career Management - 2

Semester : II

Credit : 2

Duration : 20 hrs

Course Description:

This course would help the students to prepare themselves for the internship, understand their roles and responsibilities as an intern. The dos and don’ts to make their internship experience more useful and meaningful. Creating their video resume & cover letter to stand out among a crowd of applicants, being able to conduct themselves in a Group Discussion and successfully clear PI rounds for the internship are the primary objectives of this course.

Content:

14. Cover Letter
15. Building effective video resumes
16. Group Discussion and Personal Interviews

Course Outcomes	Description	Cognition	Hours	Evaluation
CO1	Understand the importance of quick thinking and situation handling skills to ace interview process for campus internship placements	**L2 - Understand**	**1**	**Internal - Assignment**

CO2	Compare self and peer contribution w.r.t verbal and non-verbal communication during Case based Group Discussion for self-improvement	**L3- Apply**	**2**	**Internal - Group Discussion**
CO3	Outline an effective cover letter highlighting their suitability for the role to stand out among the pool of applicants	**L3- Apply**	**10**	**Internal** **External - Case Study**
CO4	Classify information in order to make an appealing video resume highlighting their skills, education, achievements in the best possible way to have an edge over other applicants	**L4- Analyze**	**2**	**Internal Class Test**
CO5	Determine the industry of their choice by shortlisting the roles, profiles & sector for internship placements.	**L5- Evaluate**	**1**	**Class Test**

The CO – PO Correlation matrix for the subject is given below:

1 – Low, 2 – Medium, 3 – High, 0 – Low

CO Code	PO1	PO2	PO3	PO4	PO5
CO1	2	3	1	3	1
CO2	1	3	2	2	-
CO3	-	2	3	-	3
CO4	-	2	3	1	-
CO5	-	2	1	2	-
CO	**1.5**	**2**	**2**	**2**	**2**

Session Plan

Session No.	Hrs	Topic/Subtopic	TOPIC Mapped with CO	Cognition	Evaluation Tools
1	1	Road Map and Placement Guidance	CO5- Determine the industry of their choice by shortlisting the roles, profiles & sectors for internship placements.	Evaluate	

2	1	Video Resumes	CO4- Classify information in order to make an appealing video resume highlighting their skills, education, achievements in the best possible way to have an edge over other applicants	Apply	Internals
3	1	Cover Letter	CO3-Outline an effective cover letter highlighting their suitability for the role to stand out among the pool of applicants	Apply	Internals-Assignment
4-6	3	Overview of a Group Discussion (Practice -Case Study)	CO2- Compare self and peer contribution w.r.t verbal and non-verbal communication during Case based Group Discussion for self improvement	Apply	Internals
7-16	9	Mock Personal Interview	CO1 Understand the importance of quick thinking and situation handling skills to ace interview process for campus internship placements	Create	Internals

Pedagogy
1. Lecture
2. Case Study
3. News/Article Analysis
4. Live Activity/Exercise
5. Videos

Evaluation:	
Internal	80%
External	20%
Total	100%

Parameters of Internal Assessment:

- Personal Interview
- Class Participation
- Attendance

Assessment Mapping

Parameter	Marks	CO 1	CO 2	CO 3	CO 4	CO 5
Internal	20	30%	10%	10%	25%	25%
Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Personal Interviews	10	-	-	-	30%	70%
End Term	**30**	**15%**	**15%**	**20%**	**20%**	**30%**

Reference Books:

Interviews and GD – GK Publication
GD and Interview – R. Gupta and Anand Gaugaly
How to succeed in GD and Interview - SK Mondal

Course Title : Capstone Project Phase 1
Semester : II
No of Credit : 2
Duration : 20 hrs

PROGRAM OUTCOMES

1.Generate conceptual knowledge regarding business management.

2. Apply knowledge of management theories and practices to solve business problems.

3. Foster Analytical and critical thinking abilities for data-based decision making.

4. Ability to develop value based leadership ability.

5. Ability to understand, analyze and communicate global, economic, legal, and ethical aspects of business.

6. Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment.

7. Ability to conduct interdisciplinary research.

8. Equip with knowledge and skills for transition from campus to corporate.

Course Outcome : Capstone Project Phase I			
Course Outcomes	After the completion of projects students should be able to	Cognition	Remarks
	Co1- Identify the sector, conduct preliminary industry analysis and finalise scope of work	**L2: Understand**	
	CO2 – To identify a business problem and to make a functional research	**L2: Understand**	

	topic		
	C03 : Ability to compare existing literature , theories and evidence	**L2 : Understand**	
	CO4 : Able to identify gap in existing literature and develop scope for additional research	**L3: Apply**	
	CO5 – They will be able to apply research outcomes and prepare research design	**L3: Apply**	

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

CO Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	3	2	1	3	2	3	1
CO2	3	3	3	1	3	2	3	1
CO3	3	3	3	1	3	2	3	1
CO4	3	3	3	1	3	2	3	1
CO 5	3	3	3	1	3	2	3	1
PO attainment	3	3	2.8	1	3	2	3	1

Course Code : **0201300803**
Course Title : **Industry Internship Project**
Semester : **II**
No. of Credit : **6**
Duration : **60 hrs.**

Program Objectives:
1) Apply knowledge of management theories and practices to solve business problems.
2) Foster Analytical and critical thinking abilities for data-based decision making.
3) Ability to develop Value based Leadership ability.
4) Ability to understand, analyze and communicate global, economic, legal, and ethical aspects of business.
5) Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment.

Course Outcome: Industry Internship Project (0206300803)			
Course Outcomes	***After the completion of course, students should be able to***	**Cognition**	**Remarks**
0201300803.1	Familiarizing the organization culture and its management functions	**Analyzing**	
0201300803.2	Application of knowledge and techniques of Business Management in organizational context.	**Applying**	
0201300803.3	Acquiring problem solving and decision-making skills and evaluating business strategies and plan through critical thinking skills	**Evaluating**	
0201300803.4	Framing suitable domain specific solutions to business problems.	**Creating**	

Mapping COs with POs

- Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

Cos	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
0201300803.1	**-**	**1**	**1**	**3**	**-**
0201300803.2	**3**	**2**	**-**	**3**	**1**

0201300803.3	**-**	**3**	**3**	**1**	**-**
0201300803.4	**-**	**3**	**1**	**2**	**3**
PO Attainment level	**3**	**2.2**	**1.6**	**2.2**	**2**

Semester III

Course Title : Strategic Management

Semester : III

Credit : 2

Strategic Management is a course that covers the direction of Business and its long-term performance. The course trains the learner in applying the concepts of functional, business and corporate strategies and doing competitor's analysis with the help of tools and techniques and also includes the global perspectives of Strategy.

Program Outcomes

1. Apply knowledge of management theories and practices to solve business problems.

2. Foster Analytical and critical thinking abilities for data-based decision making.

3. Ability to develop Value based Leadership.

4. Ability to understand, analyze and *communicate* global, economic, legal, and ethical aspects of business.

5. Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment.

Course Outcomes

After completing the course, the student should be able to-

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
CO 1	**Explain** the Business Environment and its relation to the Strategic Management process.	**K2 Understanding**	4	Internal Quiz End Term-Theory

CO 2	**Apply** the Strategic Management tools for the optimum organizational performance.	**K3 Applying**	4	Internal- Case End Term- Theory
CO 3	**Construct** the strategic tools and techniques for corporate /business/functional levels of the decision making.	**K3 Applying**	3	Internal- Test, Presentation End Term- Application Questions
CO 4	**Examine and infer** the various strategic alternatives and determine the appropriate strategy in real world scenarios.	**K 4 Analyzing**	6	Internal- Test, Presentations End Term- Theory & Case
CO 5	**Assess and integrate** knowledge from Strategic Management to solve problems in a large multi-disciplinary context.	**K5 Evaluating**	3	Internal- Test, Project End Term- Case/Theory

Mapping COs with POs

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / POs	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	3	-	1	3
CO2	3	1	2	3	2
CO3	2	2	2	2	1
CO4	2	2	1	3	3
CO5	2	2	1	2	3
CO	**2.4**	**2.0**	**1.2**	**2.2**	**2.4**

Session Plan

Sr. No	Hrs	Units	COs	Topics Mapped with CO	Evaluation Tools
1	**4**	**Introduction to Strategic Management**			

(i)	4	Organizations and strategy- What is Strategy? What makes a strategy winner? Strategic Management and competitiveness	CO1: **Explain** the Business Environment and its relation to the Strategic Management process.	K2: Understand	Internal-Quiz End Term-Theory/Short Notes
2	**6**	**Environmental Analysis**			
(i)	**4**	Evaluating the External Environment: Strategically relevant factors, Industry driving forces, Industry KSFs. Competition, and Competitor Analysis, Competitive weapons for competing with rivals. ETOP Study. I/O Model of Above Average Returns	CO2: **Apply** the Strategic Management tools for the optimum organizational performance.	K3 & K4 Apply & Analyze	Internal-Case Study End Term-Theory Questions
(ii)	**2**	The Internal Organization: Resources, Tests of Resource's Competitive Power. Capabilities, Competencies, and Competitive Advantages, Distinctive Competence, Resource Based Model	CO4**: Examine and infer** the various strategic alternatives and determine the appropriate strategy in real world scenarios.		Internal-Case Study End Term-Theory Questions
3	**7**	**Competition Analysis and Types of Strategy**			
(i)	**3**	Business-Level Strategy, Competitive Rivalry and dynamics, Quest for competitive advantage and Dynamics, Industry Analysis. Outcomes of Environment and industry analysis. (The Herfindahl-Hirchman Index)	CO3: **Construct** the strategic tools and techniques for corporate, business and functional levels of the decision making.	K3 & K4 Apply & Analyse	Internal-Test End Term-Theory Questions
	4	Corporate-Level Strategy- Grand Strategies, Portfolio Analysis and Corporate Parenting, Strategic Acquisition and Corporate Restructuring, Rationale for restructuring, Global Strategy, The three main strategic approaches, Profit sanctuaries and Cross Border Strategic Moves.	CO4**: Examine and infer** the various strategic alternatives and determine the appropriate strategy in real world scenarios.		Internal-Test/Presentations End Term-Comprehensive Case
4	**3**	**Cooperative Strategies and Organizational Structure Decisions**			
(i)	**3**	Cooperative Implications for Strategy, Structure and Controls with Organizations, Stages of Development of Organization, Organization Design and Change.	CO5: **Assess and integrate** knowledge from Strategic Management to solve problems in a large multi-disciplinary context.	K4 & K5 Analyze & evaluate	Internal-Test End Term-Theory Questions

Pedagogy

44. Lecture
45. Case Studies
46. Flipped Classroom

Evaluation

Internal	60%
External	40%
Total	**100%**

Parameters of Internal Assessment:

- Attendance & Class Participation
- Class Test and Assignments
- Reflection Journals
- Projects

Assessment Mapping

Parameter	Marks	CO 1	CO 2	CO 3	CO 4	CO 5
Internal	20	15%	18%	22%	24%	21%
Attendance & Class Participation	5	20%	20%	20%	20%	20%
Class Test & Assignments	5	30%	30%	15%	15%	10%
Reflection Journals	5	10%	20%	30%	20%	20%
Projects	5	-	-	30%	40%	30%
End Term	**20**	**5%**	**15%**	**30%**	**30%**	**20%**

Textbook:

Book Title	Name of Author	Publisher	Edition No.	Year
Strategic Management-Competitiveness	Hitt, Ireland & Hoskisson	Cengage	12th	2021

& Globalization				

Reference Books:

Book Title	Name of Author	Publisher	Edition No.
Strategic Management- Theory and Cases- An integrated Approach	Charles Hill, Mellissa Schilling & Gareth Jones	Cengage	13th
Economics of Strategy	David Besanko, David Dranove, Mark Shanley, and Scott Schaefer	Wiley India	Edition 6 International Student Version
Strategy and the Business Landscape	P Ghemawat	Ghemawat Publishing	4th
Crafting and Executing Strategy- The Quest for Competitive Advantage- Concepts and Cases	Arthur A Thompson Jr, Margaret A Peteraf, John E Gamble and A J Strickland III	McGrawHill	22nd
Concepts in Strategic Management and Business Policy	Thomas L Wheelen et al	Pearson	15th

Course Title : Business Ethics & Corporate Governance
Semester : III
Credit : 2
Duration : 20 hrs. (75 minutes each)

Course Description:
The need for Business Ethics is very much essential and applicable for today's organizations due to the stringent expectations of society and stakeholders regarding business performance. The intellectual roots of the subject are drawn from human values, philosophy, Political theories and its corollaries. The course initially aims at examining real-life ethical dilemmas and challenges in business, through case studies.

CO Code	Course Outcome : Student will be able to	Cognition	Hours	Evaluation Tools
CO1	**Outline** the scope and importance of ethics and ethical behaviour in personal and professional life	K2-Understand	5	Internal Quiz, test
CO2	**Manage** and Analysis ethical issues in business and challenges in functional areas to work for the welfare and betterment of stakeholders.	K3 -Apply	7	Internal Dialogue and Role Play
CO3	Imbibe ethical issues in corporate governance and to adhere to ethical codes	K4-Analyse	5	Internal Test, Role Play End-term Exam
CO4	Assess various corporate social responsibilities and practise in their professional life	K5-Evaluate	3	Internal Test, Case

				Study End-term-Exam

Mapping COs with POs
Scale 1 - low alignment, 2 - Moderate alignment, 3 - high alignment, - No alignment

COs / POs	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**
CO1	3	1	1	3	1
CO2	3	3	1	3	2
CO3	3	3	3	3	3
CO 4	3	3	3	3	**3**
CO5	**2**	**1**	**1**	**3**	**2**
CO	**2.8**	**2.2**	**1.8**	**3**	**2.2**

Syllabus and CO mapped

Sr. No	**Hrs**	**Units**	**Cos**	**Topics Mapped with CO**	**Evaluation Tools**
1	**4**	**Introduction to Business Ethics and Overview**			
(i)	4	Theoretical approaches to Business Ethics, Ethics and Morality, Indian Thoughts on Ethics, Ethical Dilemma	CO1: **Outline** the scope and importance of ethics and ethical behavior in personal and professional life	K2: Understand	Internal Quiz, Test
2	**4**	**Business and Environment**			
(i)	**4**	Ethical issues in the Business and responsibility towards Environment. Discussing various theories of business ethics	CO2: **Manage** and Analysis ethical issues in business and challenges in functional areas to work for the welfare and betterment of stakeholders.	K3: Apply	Internal Dialogue and Role Play
3	**4**	**Ethics in Functional areas**			
(i)	4	Ethical issues in Marketing and Consumer Protection Act, Ethical issues in HRM, Finance, IT	CO2: **Manage** and Analysis ethical issues in business and challenges in	K3: Apply	Internal Test, Role Play End-term Exam

			functional areas to work for the welfare and betterment of stakeholders		
4	**4**	**Corporate Governance and Regulatory Framework**			
(i)	4	Significance of Corporate Governance in business environment, regulatory framework, Cadbury Committee Report ,Narayan Murthy, Committee Report, Role of SEBI, Companies Act 2013	CO3: Imbibe ethical issues in corporate governance and to adhere to ethical codes	K4-Analyse	Internal Test, Case Study End-term-Exam
5	**4**	**Corporate Social Mechanism**			
(i)	4	Understanding the Indian scenario of Corporate Social responsibility, Understanding the various models such as Anglo-American Model, German Model, Japanese Model	CO4: Assess various corporate social responsibilities and practise in their professional life	K5-Evaluate	Internal Test, Case Study End term-Exam

SESSION-WISE COURSE OUTLINE:

Session	Topics	Aligned CO's
1	**Introduction to Business Ethics and Overview,**	**CO1**
2	Theoretical approaches to Business Ethics, Ethics and Morality, , Ethical Dilemma	**CO1**
3	Various theories of Ethics	**CO1**
4	Ethical issues in the Business and responsibility towards Environment. Discussing various theories of business ethics	**CO2**
5	Ethical issues in the Business and responsibility towards Environment. Discussing various theories of business ethics	**CO2**
6	Ethical issues in Marketing and Consumer Protection Act,	**CO2**
7	Ethical issues in HRM,	**CO2**
8	Ethical issues Finance, IT	**CO2**
9	Significance of Corporate Governance in business environment, regulatory framework,	**CO3**
10	Cadbury Committee Report ,Narayan Murthy, Committee Report, Role of SEBI,	**CO3**

11	Companies Act 2013	**CO3**
12	Understanding the Indian scenario of Corporate Social responsibility,	**CO3**
13	Understanding the various models such as Anglo-American Model, German Model, Japanese Model	**CO4**
14	Understanding the various models such as Anglo-American Model, German Model, Japanese Model	**CO4**
15	Presentation	**CO4**
16	*Presentation*	**CO4**

Pedagogy

1. Lecture, Case Studies , Videos, Presentation and Assignments

Evaluation

Internal 80%
External 20%
Total **100%**

Internal Assessment	**40 Marks**
End Tem	**10 Marks**
Internal Assessment	
Class Test/MCQ	10 Marks
Presentation	10 marks
Class participation	10 marks
Attendance	10 marks
End Term	
End Term Examination	10 Marks

Assessment Mapping

Parameter	Marks	CO 1	CO 2	CO 3	CO 4	CO 5
Internal	40					
Attendance	06	15%	15%	15%	15%	15%
Class Participation	06	15%	15%	15%	15%	15%
Class Test	14	35%	35%	35%	35%	35%

Case study presentation	14	35%	35%	35%	35%	35%
End Term	**10**					

Textbook:

1) Ethics in Business and Corporate Governance - S. K. Mandal (2nd Ed). Tata-McGraw Hill, 2017
2) Business Ethics: An Indian Perspective - . C. Fernanado

Reference Books:

1) Business Ethics: Concepts & Cases - Manuel Velasquez (PHI).
2) Business Ethics - A. Crane and D. Matten, 2nd Edition
3) Corporate Governance - Satheesh Kumar (Oxford)
4) Report of the Committee on the Financial Aspects of Corporate Governance – 1992 Adrian Cadbury.
5) Report on Corporate Governance - Narayan Murthy Committee : 2003

E-Books:

1) Business Ethics - James Brousseau

Course Code : 0210300351
Course Title : Deep Learning and Neural Networks
Semester : III
Credit : 2
Duration : 20 hours (75 minutes per session)
Course Faculty:

Course Description

This course is an introduction for students to remember deep learning, a branch of machine learning concerned with the development and application of modern neural networks. At the end of the course, students will understand the major technology trends driving Deep Learning. Deep learning algorithms extract layered high-level representations of data in a way that maximizes performance on a given task. Students will be able to build, train and apply fully connected deep neural networks. In addition, students will know how to analyse efficient neural networks. The course will cover evaluation of topics from introduction to deep learning, basic neural networks, and convolutional and recurrent network structures. Deep learning is behind creation of many recent advances in AI, including Siri's speech recognition, Facebook's tag suggestions and self-driving cars.

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
After the completion of course, students should be able to				
CO1	Explain foundational concept of neural networks and deep learning with the significant technological trends driving the rise of deep learning to participate in the development of leading-edge AI technology.	**K2 -Understand**	**14.67**	Internal Test End Term- Theory
CO2	Implement industry-relevant Deep learning concepts to provide real insights to decision making in business.	**K-3 Apply**	**2.0**	Internal Assignment End Term- Theory, Case Studies
CO3	Compare alternatives by building and training neural network architectures in order to cope up with the futuristic challenges of business.	**K-4 Analyse**	**1.7**	Internal Assignment End Term- Theory, Case Studies
CO4	Defend model quality to apply these algorithms to image, video, and other 2D/3D data for optimizing business strategies.	**K-5 Evaluate**	**1**	Internal Assignment End Term- Theory, Case Studies

CO5	Appraise the business value of neural networks in various sectors to derive value propositions for organizations.	**K-5 Evaluate**	**0.7**	Internal Assignment End Term- Theory, Case Studies

Mapping COs with POs

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / POs	PO 1	PO 2	PO 3	PO 4	PO 5	CO
CO1	3	-	-	-	-	**3.0**
CO2	-	-	3	-	-	**3.0**
CO3	-	-	2	-	-	**2.0**
CO4	-	-	3	-	-	**3.0**
CO5	-	-	3	-	-	**3.0**

Course contents

- Introduction to Deep Learning
- Introduction to Neural Networks
- Introduction to Neural Networks
- Deep Neural Networks
- Introduction to Convolutional Neural Networks
- Introduction to Tensor Flow

Session Plan

Sr.NO	Hours	Units	COs	Topics Mapped with CO	Evaluation Tools

1,2	2.5	Introduction to Deep Learning	CO1	K2 -Understand	Internal Test End Term- Theory
		What is Deep Learning? Difference between Deep Learning and Machine Learning What is NLP? Why Deep Learning? Review of Machine Learning: Classification, Clustering, Reinforcement Learning and Logistic Regression			
3,4	2.5	Linear Algebra Vectors	CO1	K2 -Understand	Internal Test End Term- Theory
5,6	2.5	Linear Algebra Matrices	CO1	K2 -Understand	Internal Test End Term- Theory
7,8	2.5	Introduction to Neural Networks	CO1 & CO2	K2 -Understand & K-3 Apply	Internal Assignment End Term- Theory, Case Studies
		Neural Networks Overview Representation of Neural Networks Computation of Neural Network Output Vector Implementation Activation Functions			
9	1.25	Introduction to Neural Networks	CO1 &	K2 -Understand & K-3	Internal Assignment End Term-

			CO2	Apply	Theory, Case Studies
		Derivatives of Activation Functions Gradient Descent for Neural Networks Random Initialization Vector Implementation Refresher - Cost Functions, Hypothesis and Tasks, Cross Entropy, Maximum likelihood based cost, Feed forward networks			
10	1.25	Optimization	CO1	K2 -Understand	Internal Test End Term-Theory
		Over fitting and Capacity Cross Validation Feature Selection Regularization Hyper parameters and Model Tuning			
11	1.25	Deep Neural Networks	CO1	K2 -Understand	Internal Test End Term-Theory

		Deep L Layer Neural Network Forward Propagation in Deep Network Why Deep Network gives better Accuracy Right Matrix Dimensions Building blocks of Deep Neural Networks Working of Propagation - Forward and Back Propagation Types of Deep Networks Hyper parameters vs Parameters			
12	1.25	Introduction to Convolutional Neural Networks	CO1	K2 -Understand	Internal Test End Term- Theory
		Introduction to CNNs CNN Applications Architecture of CNN Properties of CNN Representations: Invertibility, stability, invariance Understanding and Visualization a CNN Kernel Filters Multiple Filters			
13,14,15,16	5.0	Introduction to Tensor Flow	CO1, CO3 & CO4, CO5	K2 -Understand, K-4 Analyse & K-5 Evaluate	Internal Assignment End Term- Theory, Case Studies

		What is Tensor flow? Tensor Flow Code Basics Creating a Graph and Visualization Computational Graph Regression Example Gradient Descent Constant, Placeholders and Variables Tensor Board			

Pedagogy
1. Lecture
2. Case Study
3. News/Article Analysis
4. Live Activity/Exercise
5. Videos

Modes of Evaluation & Examination Scheme:

Evaluation:	
Internal Assessment	20 Marks
External Assessment	30 Marks
Total	50 Marks

Internal Assessment:	
Class Attendance	5 Marks
Class Participation	5 Marks
Class Test	5 Marks
Assignment	5 Marks

External Assessment:	
End Term Examination	30 Marks

Assessment Mapping:

Parameter	Marks	CO-1	CO-2	CO-3	CO-4	CO-5
Internal	20	20%	20%	20%	20%	20%
Class Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Class Test	5	50%	50%	0%	0%	0%
Assignment	5	0%	37%	25%	13%	25%
End Term	30	20%	20%	40%	10%	10%

Text book:

Ian Goodfellow, Yoshua Bengio, Aaron Courville. Deep Learning.

Reference Books:

17. Duda, R.O., Hart, P.E., and Stork, D.G. Pattern Classi□□cation. Wiley-Interscience. 2nd Edition. 2001.
18. Theodoridis, S. and Koutroumbas, K. Pattern Recognition. Edition 4. Academic Press, 2008.
19. Russell, S. and Norvig, N. Arti□□cial Intelligence: A Modern Approach. Prentice Hall Series in Arti□□cial Intelligence. 2003.
20. Bishop, C. M. Neural Networks for Pattern Recognition. Oxford University Press. 1995.
21. Hastie, T., Tibshirani, R. and Friedman, J. The Elements of Statistical Learning. Springer. 2001.
22. Koller, D. and Friedman, N. Probabilistic Graphical Models. MIT Press. 2009.

E-Books:

47. https://www.cs.tau.ac.il/~dcor/Graphics/pdf.slides/YY-Deep%20Learning.pdf

48. http://deeplearning.net/tutorial/deeplearning.pdf

Course Code : 0210300352
Course Title : Analytic Modelling with R
Semester : III
Credit : 4
Duration : 40 hours (75 minutes per session)
Course Faculty:

Course Description

This course is designed to give theory and practical exposure in the ways in which businesses can use data to gain insights and make better decisions for students to remember. It covers the application of basics of analytics through R, Predictive Analytics, Text Analytics & Sentiment Analysis and imposes the ability to use data effectively to drive rapid, precise and profitable decisions. It covers analyses of case studies on organizations that successfully deployed these techniques, how to use data to develop insights and predictive capabilities using data mining, optimization and forecasting techniques. Students will learn to identify, evaluate, and create business analytic opportunities that create value to the business and learn basic analytic methods using R.

Course Outcomes	Description	Cognition	Hours	Evaluation Tool
After the completion of course, students should be able to				
CO1	Discuss the basics of the R language such as data types, techniques for manipulation, to implement fundamental programming tasks.	**K2 -Understand**	**10**	Internal Test End Term- Theory
CO2	Implement the fundamentals of statistics in R environment for statistical computing and design.	**K-3 Apply**	**5**	Internal Viva, Assignment End Term- Theory
CO3	Execute R techniques to summarize data and identify relevant relationships between variables that can lead to business insights.	**K-4 Analyse**	**5**	Internal Viva, Assignment End Term- Theory
CO4	Appraise R models, tune their performance and weigh them to ultimately choose the best model.	**K-5 Evaluate**	**9**	Internal Viva, Project Report and Presentation End Term- Theory,

CO5	Weigh various alternatives in order to cope up with the futuristic challenges and competitions in business through analytics using R.	**K-5 Evaluate**	**11**	Internal Assignment End Term- Theory, Case Studies

Mapping COs with POs

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / Pos	PO 1	PO 2	PO 3	PO 4	PO 5	CO
CO1	3	-	-	-	-	**3.0**
CO2						
CO3	-	-	3	2		**2.5**
CO4	-	2	-	-	-	**2.0**
CO5	-	3	-	-	-	**3.0**

Course Contents:

- Latest trends in Analytics
- Structured Data and Unstructured Data
- Introduction to R and R Installation
- R Basics
- R Packages & R in depth
- R Data Interfaces
- R Charts & Graphs
- R Statistics & Data Science Applications
- Linear Regression using R
- Logistic Regression
- Decision Trees
- Time series in R
- Clustering
- Association rules
- Text Analytics

Session Plan:

Sr. No	Hrs	Units	Cos	Topics Mapped with CO	Evaluation Tools
1	1.25	Latest trends in Analytics	CO1	K2 -Understand	Internal Test End Term- Theory
		Why analytics is important for business			
2	1.25	Structured Data and Unstructured Data	CO1	K2 -Understand	Internal Test End Term- Theory
		Discover patterns from data			
3	1.25	Introduction to R R Installation	CO1, CO2 & CO3	K2- Understand, K3-Apply, K4- Analyze	Internal Test, Viva, Assignment End Term- Theory
		Introduction to R What is R? Origins of R Current Status R Ecosystem Commercial products How R can help in Business Analytics, Data Mining, Data Visualization R Installation – Windows – Linux 49. Macintosh – Using VMware for virtual partition – CRAN and Packages R Interfaces – Command line – Graphical User Interfaces – IDE – Web Interfaces Advantages and Disadvantages of using R			
4 & 5	2.5	R Basics	CO1, CO2 & CO3	K2- Understand, K3-Apply, K4- Analyze	Internal Test, Viva, Assignment End Term- Theory

		Data Types (R objects and Attributes) Variables Operators Functions Vectors Strings Matrices & Arrays Factors Lists Data Frames Reading Tabular Data and Large Tables along with Textual Data formats			
6	1.25	R Packages & R in depth			
		Data Input Data Import Spreadsheet Like Data Statistical File Formats Databases Internet Data Data from Packages Using GUI for Data Import	, CO2 & CO3	, K3-Apply, K4-Analyze	Internal Viva, Assignment End Term-Theory
7	1.25	R Data Interfaces			
		Data Manipulation Transposing Dataset Conditional selection of rows, columns, variables Using Reshape Merging Datasets Data Exploration Types of Data in R Summarizing data in R Using GUI for Data Exploration Graphs in R CSV Files, XML Files, Excel Files, Database, JSON Files, Web data	CO2 & CO3	K3-Apply, K4-Analyze	Internal Viva, Assignment End Term-Theory
8	1.25	R Charts & Graphs			
		Data Visualization Introduction to ggplot2 Plotting using R data frames Graphics on large data Visualizing Statistical Outputs Bar Chart, Histograms, Heat Map, Scatter Plot, Box Plot, Correlogram, Area Chart	CO2 & CO3	K3-Apply, K4-Analyze	Internal Viva, Assignment End Term-Theory
9	1.25	Evaluation I	CO1, CO2 & CO3	K2-Understand, K3-Apply, K4-	Internal Test, Viva, Assignment End Term-

				Analyze	Theory
10 & 11	2.5	R Statistics & Data Science Applications			
		How to export data? Exporting Graphs Saving code and output Exporting using GUI	CO2 & CO3	K3-Apply, K4-Analyze	Internal Viva, Assignment End Term-Theory
12	1.25	R Statistics & Data Science Applications			
		Introduction to statistics Summary statistics – Mean – Median – Mode – Variance	CO2 & CO3	K3-Apply, K4-Analyze	Internal Viva, Assignment End Term-Theory
		R Statistics & Data Science Applications			
13 & 14	2.5	Random Variables Probability Probability distribution – Binomial – Poisson – Normal	CO1	K2 -Understand	Internal Test End Term-Theory
15 & 16	2.5	Hypothesis testing	CO1	K2 -Understand	Internal Test End Term-Theory
		– Intuition – Standard approaches T-test – One sample – Two Sample			
17	1.25	Chi-Square Analysis	CO1	K2 -Understand	Internal Test End Term-Theory
18, 19	2.5	Regression modeling using R			
		Linear Regression Creating a model and Scoring a model Understanding Model Output (Coefficients, Fit, Residuals, R square, P Value)	CO4 & CO5	K-5 Evaluate	Internal Viva, Project Report and Presentation, Assignment

					End Term- Theory,
20,21	2.5	Logistic Regression	CO4 & CO5	K-5 Evaluate	Internal Viva, Project Report and Presentation, Assignment End Term- Theory,
22.23	2.5	Decision Trees	CO4 & CO5	K-5 Evaluate	Internal Viva, Project Report and Presentation, Assignment End Term- Theory,
24, & 25	2.5	Time series in R.	CO4 & CO5	K-5 Evaluate	Internal Viva, Project Report and Presentation, Assignment End Term- Theory,
26& 27	2.5	Clustering in R Hierarchical Clustering K Means Clustering	CO4 & CO5	K-5 Evaluate	Internal Viva, Project Report and Presentation, Assignment End Term- Theory,
28,29 & 30	2.5	Text Mining with R,	CO4 & CO5	K-5 Evaluate	Internal Viva, Project Report and Presentation, Assignment End Term- Theory,
31 & 32	2.5	Parallel computing with R.	CO4 & CO5	K-5 Evaluate	Internal Viva, Project Report and Presentation, Assignment

					End Term- Theory,

Pedagogy

1. Lecture
2. Case Study
3. News/Article Analysis
4. Live Activity/Exercise
5. Videos

Assessment Criteria:

Evaluation:	
Internal Assessment	40 Marks
External Assessment	60 Marks
Total	100 Marks

Internal Assessment:	
Class Attendance	5 Marks
Class Participation	5 Marks
Class Test	10 Marks
Assignment	10 Marks
Project	10 Marks

External Assessment:	
End Term Examination	60 Marks

Assessment Mapping:

Parameter	**Marks**	**CO-1**	**CO-2**	**CO-3**	**CO-4**	**CO-5**
Internal	40	31%	25%	20%	12%	12%
Class Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Class Test	10	50%	50%	0%	0%	0%
Assignment	10	50%	50%	0%	0%	0%
Project	10	0%	0%	38%	31%	31%
End Term	60	25%	35%	5%	20%	15%

Text book:

1) Data Analytics using R, Seema Acharya, 5th Edition, Mc Graw Hill

Reference Books:

1) Data Analytics, Anil Maheshwari, Mc Graw Hill

2) Fundamentals of Business Analytics, R N Prasad, Seema Acharya, 2nd Edition, Wiley

3) Learning R, Richard Cotton, Oreilly

4) Hands-on programming with R, Garrett Grolemund, Oreilly

5) R Packages, Hadley Wickham

6) R Cookbook, Paul Teetor, Oreilly

E-Books:

23. https://cran.r-project.org/doc/contrib/usingR.pdf
24. https://www.cl.cam.ac.uk/techreports/UCAM-CL-TR-920.pdf
25. https://static1.squarespace.com/static/57af6d69b3db2b8d0eade247/t/580a6f849f74564489f129dc/1477078927168/R2.pdf

Course Code : 0210300353
Course Title : Supply Chain Analytics
Semester : III
Credit : 2
Duration : 20 hours (75 minutes per session)
Course Faculty:

Course Description

This course will cover the basics of Operations Management, Supply Chain Management and Supply Chain Analytics. The students will have an overview of application of Descriptive, Predictive and Prescriptive Analytics in Supply Chain. It helps students to understand the nature and scope of Operations Management and the role of OM in Finance, Marketing, HR, and other areas of organization. Students can apply the various sub-systems in SC and the integration of all the sub systems in addition to analysing the mathematical models to improve the performance of Supply Chain. The course evaluates the various strategies for material storage, transportation, inventory, and sourcing. In conclusion, the course creates the importance of Analytics in Supply Chain Management.

Course Outcomes

Curse Outcomes	Description	Cognition	Hours	Evaluation Sheet
After the completion of course, students should be able to				
CO1	Describe the nature and scope of Operations Management and the role of supply chain analytics in various functions of organization.	K2 -Understand	10	Internal : Test End Term: Theory
CO2	Execute the concepts of SCM to solve real time problems with data to improve	K-3 Apply	2.5	Internal :

	the speed, reliability, and quality of decisions in business.			Assignment End Term: Theory
CO3	Implement the right set of digital technologies, techniques and models for different types of SCM problems to create more value for business.	K-3 Apply	6.25	Internal : Assignment End Term: Theory
CO4	Appraise methodologies and models used in supply chain analysis to convert data into intelligence that can make value chain more successful.	K-5 Evaluate	0.25	Internal : Assignment End Term: Theory
CO5	Judge the business value of operations analytics in various sectors to derive value propositions for organizations.	K-5 Evaluate	1.00	Internal : Assignment End Term: Theory

Mapping COs with POs

<u>Scale</u> 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / POs	PO 1	PO 2	PO 3	PO 4	PO 5	CO
CO1	3	-	-	-	-	**3.0**

CO2	-	-	3	-	-	**3.0**
CO3	-	1	-	-	-	**1.0**
CO4	-	-	3	-	-	**3.0**
CO5	-	-	3	-	-	**3.0**

- Navigating through the evolution of SCM
- SCM Analytics - including the Big Data revolution
- Demand Forecasting in SCM
- Online Retail Inventory Management
- Raw material cost management
- Spare parts supply
- Service delivery Management

Session Plan:

Sr.NO	Hours	Units	COs	Topics Mapped with CO	Evaluation Tools
1	1.25	Operations Management Overview			
		Operations Management in Manufacturing & Service Sectors Transformation Process Types of Production Systems Interface of Operations with Finance, Marketing, HR	CO1	K2 -Understand	Internal : Test End Term: Theory
2	1.25	Capacity Planning			

		Types of Capacity Capacity planning Strategies- Short, Medium, Long term Class exercise on Capacity	CO1	K2 -Understand	Internal : Test End Term: Theory
3	1.25	Production & Operations Planning and Control			
		Aggregate Planning Material Requirement Planning Operations Planning & Control	CO1	K2 -Understand	Internal : Test End Term: Theory
4	1.25	Inventory Management			
		Inventory Types Inventory Costs Importance of Inventory Control Methods of Inventory Control	CO1	K2 -Understand	Internal : Test End Term: Theory
5	1.25	SCM			
		The Latest in SCM Navigating through the evolution of SCM Discovering the Key SCM processes and defining Supply Chain Metrics	CO1	K2 -Understand	Internal : Test End Term: Theory
6	1.25	SCM Analytics			

		Getting Started with Analytics in SCM SCM Analytics - including the Bigdata revolution Classifying SCM Data Common areas of Analytics in SCM; Reverse SCM; Blockchain in SCM Demonstrate the Basics of Python and R	CO2	K-3 Apply	Internal : Assignment End Term: Theory
7	1.25	Concepts			
		Demand Forecasting in SCM Time series and forecasting concepts	CO1	K2 -Understand	Internal : Test End Term: Theory
8	1.25	Case Study			
		A company has 4 warehouses and wants to do a demand forecast for efficiency	CO3	K-3 Apply	Internal : Assignment End Term: Theory
9	1.25	Concepts			
		The Challenges of online Retail stores The key to good visualization	CO3	K-3 Apply	Internal : Assignment End Term: Theory
10	1.25	Case Study			

		The company mainly sells unique all-occasion gifts. Many customers of the company are wholesalers. It wants to devise the optimum quantities to stock	CO3	K-3 Apply	Internal : Assignment End Term: Theory
11	1.25	Concepts			
		The data format for sensor data – Big data Linear regression concepts	CO1	K2 -Understand	Internal : Test End Term: Theory
12	1.25	Case Study			
		There are different sources of electric power which are available at different costs. The company wants to devise an optimum usage and cost understanding for its plants. The sensor feed is at regular time intervals.	CO2	K-3 Apply	Internal : Assignment End Term: Theory
13	1.25	Concepts			
		Spare parts and their classification; Inventory Management Clustering concepts	CO3	K-3 Apply	Internal : Assignment End Term: Theory
14	1.25	Case Study			
		There is a company which uses many different types of parts which are supplied by different vendors. It wants to cluster the parts to identify groups which are ordered together for more efficient inventory management	CO3	K-3 Apply	Internal : Assignment End Term:

					Theory
15	1.25	Concepts			
		SLA (Service level contracts) and understanding Descriptive statistics and Associative statistics	CO1 & CO4 , CO5	K2 -Understand & K5- Evaluate	Internal : Test, Assignment End Term: Theory
16	1.25	Case Study			
		A company has a bank end team based out of India to handle post - purchase queries and service requests from all over the globe. It has a method to identify each request as Important or normal. It needs to understand if its service standard is as per norm (SLA) or not and if the tagging needs to be changed to drive greater efficiency	CO1 & CO2 &CO4, CO5	K2 -Understand, K3- Apply & K5- Evaluate	Internal : Test, Assignment End Term: Theory

Pedagogy

1. Lecture
2. Case Study
3. News/Article Analysis
4. Live Activity/Exercise
5. Videos

Modes of Evaluation & Examination Scheme:

Evaluation:	
Internal Assessment	20 Marks
External Assessment	30 Marks
Total	50 Marks

Internal Assessment:	
Class Attendance	5 Marks

Class Participation	5 Marks
Class Test	5 Marks
Assignment	5 Marks

External Assessment:	
End Term Examination	30 Marks

Assessment Mapping:

Parameter	Marks	CO-1	CO-2	CO-3	CO-4	CO-5
Internal	20	31%	39%	11%	9%	11%
Class Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Class Test	5	50%	50%	0%	0%	0%
Assignment	5	0%	37.50%	25.00%	12.50%	25%
End Term	30	25%	15%	45%	15%	0%

Text Book:

Supply Chain Management: Strategy, Planning and Operations, Sunil Chopra, Pearson

Reference Books:

1. Production and Operations Management, K. Ashwathappa, Himalaya Publications
2. Supply Chain Management: Text and Cases, Vinod Sople, Pearson Publications
3. Supply Chain Management: Strategy, Planning and Operations, Sunil Chopra, Pearson Publications
5. Essentials of Business Analytics, Jeffrey Camm, South – Western College Publications
6. Business Analytics, James Evans, Pearson Publications
7. Business Analytics: Data Analysis and Decision Making, Christian Albright, South – Western College Publication
8. Designing and Managing Supply Chain, David Simchi – Levi, Mc- Graw Hill Publications

E Books:

50. https://scg-lm.s3.amazonaws.com/pdfs/opentext-wp-dummies-guide-to-sca-100318.pdf

Course Code : **0210300354**
Course Title : **Risk Analytics**
Semester : **III**
Credit : **2**
Duration : **20 hours (75 minutes per session)**
Course Faculty:

Course Description

Risk Analytics course is aimed at providing knowledge of financial risk with expertise in handling complex financial data with the help of advanced level statistical modelling and risk Analytics tools for students to remember. The students shall not only be equipped with the knowledge of how to use analytical tools but also understand risk analytics domain expertise owing to various projects / case studies they will work upon as part of the course. The course involves application of Quantitative Models, Statistical Methods, Numerical Algorithms, and software to address the challenging and important issues associated with Big Financial Data. The course includes analyses and evaluation of Credit Risk Analytics, Regulatory Compliance, stress testing and its impact. Lastly, the students should create a project on excel using all these topics.

Course Outcomes

Course Outcomes	Description	Cognition	Hours	Evaluation
After the completion of course, students should be able to				
CO1	Describe the fundamentals concepts and methodologies of risk modelling and how it is important for financial institutions.	K2: Understand	**12.25**	Internal Class Test End Term Theory
CO2	Execute concepts of financial risk analytics with a focus on data-driven modelling, computation and statistical estimation to drive business decisions and manage risks.	K3: Apply	**4.75**	Internal Assignment End Term Theory
CO3	Contrast alternatives considering the concepts of risk analytics to cope up with the business challenges.	K4: Analyse	**2.17**	Internal Assignment End Term Theory
CO4	Defend results obtained through several risk models to better quantify financial risks and assign economic capital.	K5: Evaluate	**0.50**	Internal Assignment End Term Theory

CO5	Weigh the business value of risk analytics in various sectors to derive value propositions for organizations.	K5: Evaluate	**0.33**	

Mapping COs with POs

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / Pos	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**CO**
CO1	3	-	-	-	-	**3.0**
CO2	-	3	3	2	-	**2.6**
CO3	-	-	3	-	-	**3.0**
CO4	-	-	3	-	-	**3.0**
CO5	-	-	3	-	-	**3.0**

Content:

51. Introduction to banking
52. Introduction to Risk Management and Basel regulations.
53. Risk Mitigation Techniques
54. Credit Risk and Score Card
55. Risk Scorecard using Excel
56. Introduction to VAR (Value at Risk)
57. Stress Testing and impact of Stress Testing in Banks.
58. Project on Excel using Risk Methods.

Session Plan:

Sr.NO	**Hours**	**Units**	**COs**	**Topics Mapped with CO**	**Evaluation Tools**
1	1.25	Introduction to Risk Management			

		Different types of risk- Market Risk, Inflation Risk, Credit risk, Interest Risk, Exchange risk, Investment risk, Sources of Risk, Risk Management Process, Introduction to Banking , Introduction to Banking Process and Banking Products	CO1	K2: Understand	Internal Class Test End Term Theory
2	1.25	Introduction to Risk Management and Basel Regulations			
		What is Risk? Types of Risk? Forex Risk, Exchange Rate Mechanism, Transaction Exposure, Economic Exposure. Basel Norms and Regulations, Basel I, II, III and its implications.	CO1	K2: Understand	Internal Class Test End Term Theory
3	1.25	Risk Mitigation Techniques			
		Mitigation of Risk through Risk Management Practices	CO1	K2: Understand	Internal Class Test End Term Theory
4	1.25	Credit Risk and Score Card			
		Introduction to Credit Risk Nature of Credit Risk PE, EEPE, IMM measures. Introduction to Score Card	CO1	K2: Understand	Internal Class Test End Term Theory
5,6,7,8,9,	6.25	Risk Scorecard using Excel			
		Types of Scorecard Importance of Scorecard in Banking How to create Scorecards in Excel? Credit Risk Measures	CO1&CO2	K2: Understand & K3: Apply	Internal Class test, Assignment End Term Theory
10	1.25	Introduction to Market Risk			

		What is Market Risk? Types of Market Risk? Factors Affecting Market Risk? Market Risk Measures	CO1	K2: Understand	Internal Class Test End Term Theory
11.12,13,14	5.0	Introduction to VaR (Value at Risk)			
		What is VaR? Methods of calculating VaR in Excel	CO1&CO2 & CO3	K2: Understand & K3: Apply & K4: Understand	Internal Class test, Assignment End Term Theory
15	1.25	Introduction to Stress Testing			
		What is Stress Testing and impact of Stress Testing in Banks? What is S-VaR?	CO1	K2: Understand	Internal Class Test End Term Theory
16	1.25	Project			
		Project on Excel using Risk Methods.	CO3 & CO4,CO5	K4: Analyse & K5 Evaluate	Internal Assignment End Term Theory

Pedagogy

1. Lecture
2. Case Study
3. News/Article Analysis
4. Live Activity/Exercise
5. Videos

-

Modes of Evaluation & Examination Scheme:

Evaluation:	
Internal Assessment	20 Marks
External Assessment	30 Marks
Total	50 Marks

Internal Assessment:	
Class Attendance	5 Marks
Class Participation	5 Marks
Class Test	5 Marks
Assignment	5 Marks

External Assessment:	
End Term Examination	30 Marks

Assessment Mapping:

Parameter	Marks	CO-1	CO-2	CO-3	CO-4	CO-5
Internal	20	6%	6%	24%	32%	32%
Class Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Class Test	5	0%	0%	20%	40%	40%
Assignment	5	0%	0.00%	37.50%	31.25%	31%
End Term	30	50%	50%	0%	0%	0%

Text Book: Financial Risk Management – Dun & Bradstreet, Tata McGraw Hill, 6th Reprint 2010

Reference Books:

- Risk Management, IIBF, Macmillan, Reprint 2013
- Theory & Practice of Treasury, Indian Institute of Banking & Finance, & Risk Management in Banks, Taxmann Publications, Reprint 2012
- Credit Risk Management, S N Bidani, P K Mitra & Pamod Kumar, Taxmann Publications, Jan 2004 edition
- Risk Management in Banks, K. Seethapathi, ICFAI press, 2004
- Risk Management & Financial- John C. Hull, Wiley, 3/e, 2012 Institutions

E Books:

- http://www.untagsmd.ac.id/files/Perpustakaan_Digital_1/CREDIT%20RISK%20An%20Introduction%20to%20credit%20risk%20modeling.pdf

Course Code : **0210300350**
Course Title : **Machine Learning and Business Applications**
Semester : **III**
Credit : **4**
Duration : **40 hours (75 minutes per session)**
Course Faculty:

Course Description

The course prepares students for research or industry application of machine learning techniques to remember. This course provides a broad understanding on introduction to machine learning and statistical pattern recognition. It is designed to apply interdisciplinary techniques such as statistics, and computer science to create automated systems that can sift through large volumes of data at high speed to make predictions or decisions without human intervention. This course coverage will familiarize students to analyse algorithms for machine learning and evaluate a broad cross-section of models.

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
After the completion of course, students should be able to				
CO1	Describe the advanced Machine learning techniques and their application to create automated systems that can train large volumes of data.	K2: Understand	**26.50**	Internal Quiz, Test End Term- Theory
CO2	Implement the concepts of supervised and unsupervised machine learning concepts to real time problems for improving the speed, reliability and quality of decisions in businesses.	K3: Apply	**10.33**	Internal- Practical's , Project ,and Presentation End Term- Theory, Case Study
CO3	Examine advanced Machine Learning models to solve real time problems and deliver tangible business benefits.	K4: Analyse	**2**	Internal- Practical's, Project Report and Presentation End Term- Case Study
CO4	Appraise performance of machine learning models with various performance metrics to cope up with the futuristic challenges and competitions in business.	K5: Evaluate	**1.00**	Internal- Assignment End Term- Case Study
CO5	Select various alternatives in order to cope up with the futuristic challenges and competitions in business through advanced machine learning algorithms.	K5: Evaluate	**0.17**	Internal- Assignment End Term- Case Study

Mapping COs with POs

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / POs	PO 1	PO 2	PO 3	PO 4	PO 5	CO
CO1	3	-	-	-	-	**3.0**
CO2	-	-	3	-	-	**3.0**
CO3	-	-	3	-	-	**3.0**
CO4	-	-	-	3	-	**3.0**
CO5	-	-	3	-	-	**3.0**

Course Contents:

(13) Supervised learning (generative/discriminative learning, parametric/non-parametric
learning, neural networks, and support vector machines)
(2) Unsupervised learning (clustering, dimensionality reduction, kernel methods)
(3) Learning theory (bias/variance trade-offs; VC theory; large margins); and
(4) Reinforcement learning and adaptive control.

Session Plan:

Sr. No	Hrs.	Units	Cos	Topics Mapped with CO	Evaluation Tools
1	1.25	Class overview: Class organization, topics overview, software etc. Introduction: what is ML, Problems, data, and tools; Visualization	CO1	K2: Understand	Internal Quiz, Test End Term- Theory
2,3		Features of Multiple Regression			
	2.5	Multiclass function coefficient of determination, significance tests, residual analysis, confidence and prediction intervals. Multiple linear regression (MLR): coefficient of multiple determination, interpretation of regression coefficients, categorical variables, heteroscedasticity, multicollinearity, outliers, auto-regression and transformation of variables, MLR model development and feature selection.	CO1 & CO2	K2: Understand K3: Apply	Internal Quiz, Test, Practical's , Project ,and Presentation End Term- Theory

4	1.25	What is classification Introduction to Classification data set Why not Linear Regression for Classification data set	CO1	K2: Understand	Internal Quiz, Test End Term- Theory
5,6	2.5	Logistic Regression			
		Sigmoid Odd Ratio Decision boundary for sigmoid function	CO1	K2: Understand	Internal Quiz, Test End Term- Theory
7,8	2.5	Probability and classification			
		Bayes optimal decisions , Naive Bayes and Gaussian class-conditional distribution , Linear classifiers , Bayes' Rule and Naive Bayes Model	CO1	K2: Understand	Internal Quiz, Test End Term- Theory
9	1.25	Detailed discussion on Decision Tree and Boosting			
		What is Decision tree Problem Statement Terminology for Decision Tree Understanding of the Problem with Decision tree	CO1 & CO3	K2: Understand K4: Analyze	Internal Quiz, Test, Practical's , Project ,and Presentation End Term- Theory
10,11	2.5	Building Decision tree			
		Algorithm for building a decision tree Criteria for splitting a decision tree - Information gain Criteria for splitting a decision tree – Gini Nominal Value for splitting decision tree	CO2, CO3, CO4 & CO5	K3:Apply K4:Analyze K5:Evaluate	Internal- Practical's , Project ,and Presentation, Assignment End Term- Theory, Case Study
12,13	2.5	Implementation of Decision Tree			
		Decision Tree Visualization through Sklearn Interpretation of Decision tree Over fitting in decision tree Indicators of Over fitting Pruning the tree	CO2, CO3, CO4 & CO5	K3:Apply K4:Analyze K5:Evaluate	Internal- Practical's , Project ,and Presentation, Assignment End Term- Theory, Case Study
14,15	2.5	Ensemble Methods			

		Introduction to Ensembling Problem Statement Wisdom of Crowd Different Techniques of Ensembling	CO1	K2: Understand	Internal Quiz, Test End Term- Theory
16,17	2.5	Aggregation			
		Naïve Aggregation Bootstrap Aggregation (Bagging) Pasting Random Forest	CO1	K2: Understand	Internal Quiz, Test End Term- Theory
18,19	2.5	Hyper Parameter Tuning			
		Definition Grid Search Random Search Stacking	CO1	K2: Understand	Internal Quiz,Test End Term- Theory
20	1.25	Gradient Boosting Techniques			
		Introduction to Boost Adaboost Adaboost Implementation	CO1	K2: Understand	Internal Quiz, Test End Term- Theory
21	1.25	Gradient Boosting Algorithm			
		What is GBA Improvements in GBA Implementation of GBA Introduction to XG Boost	CO1 & CO2	K2: Understand K3: Apply	Internal Quiz, Test, Practical's , Project ,and Presentation End Term- Theory
22	1.25	Unsupervised learning: Clustering, k-means, hierarchical agglomeration			
		Introduction to Unsupervised Methods What is Unsupervised Learning Introduction to Clustering Types of Clustering and Clustering Algorithms	CO1	K2: Understand	Internal Quiz,Test End Term- Theory
23,24	2.5	K-Means Clustering			
		Working of K-Means Maths behind K means Practical Consideration for K means Implementation of Clusters with K-means	CO1 & CO2	K2: Understand K3: Apply	Internal Quiz, Test, Practical's , Project ,and Presentation

					End Term- Theory
25,26	2.5	Hierarchical Clustering			
		What is Hierarchical Clustering Types of Hierarchical Clustering Parameters of Agglomerative Clustering Considerations for Agglomerative Clustering	CO1 & CO2	K2: Understand K3: Apply	Internal Quiz, Test, Practical's , Project ,and Presentation End Term- Theory
27,28	2.5	Data Reduction Techniques: Factor Analysis			
		Text representations; naive Bayes and multinomial models; clustering and latent space models	CO1 & CO2	K2: Understand K3: Apply	Internal Quiz, Test, Practical's , Project ,and Presentation End Term- Theory
29	1.25	VC-dimension, structural risk minimization; margin methods and support vector machines (SVM)			
		Support vector machines and large-margin classifiers	CO1	K2: Understand	Internal Quiz,Test End Term- Theory
30,31 32	3.75	Time series; Markov models; autoregressive models ARIMA Model ,Holtz winter method and dynamic regression model	CO1 & CO2	K2: Understand K3: Apply	Internal Quiz, Test, Practical's , Project ,and Presentation End Term- Theory

Pedagogy

1. Lecture
2. Case Study
3. News/Article Analysis
4. Live Activity/Exercise
5. Videos

Assessment Criteria:

Evaluation:	
Internal Assessment	40 Marks
External Assessment	60 Marks
Total	100 Marks

Internal Assessment:	
Class Attendance	5 Marks
Class Participation	5 Marks
Class Test	10 Marks
Assignment	10 Marks
Project	10 Marks

External Assessment:	
End Term Examination	60 Marks

Assessment Mapping:

Parameter	Marks	CO-1	CO-2	CO-3	CO-4	CO-5
Internal	40	5%	31%	26%	21%	16%
Class Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Class Test	10	50%	50%	0%	0%	0%
Assignment	10	50%	50%	0%	0%	0%
Project	10	0%	0%	38%	31%	31%
End Term	60	25%	35%	5%	20%	15%

TextBook:

Ethem Alpaydin, Introduction to Machine Learning, Second Edition, http://mitpress.mit.edu/catalog/item/default.asp?ttype=2&tid=12012.

Reference books:

59. Stephen Marsland, Machine Learning: An Algorithmic Perspective. http://www.amazon.com/Machine-Learning-Algorithmic-PerspectiveRecognition/dp/1420067184 .
60. Christopher M. Bishop, Pattern Recognition and Machine Learning. http://research.microsoft.com/en-us/um/people/cmbishop/prml/.
61. Tom Mitchell, Machine Learning, http://www.cs.cmu.edu/~tom/mlbook.html.

E-Books:

- https://web.stanford.edu/~hastie/Papers/ESLII.pdf
- https://alex.smola.org/drafts/thebook.pdf

Course Code : 0201300353
Course Title : Comprehensive Review Module
Semester : III
No. of Credit : 2
Duration : 20 hrs.
Course Faculty :

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
CO1	CO1 Refresh conceptual knowledge of the functional domain	K2: Understand	2	Internal- Test End Term Theory
CO2	CO 2 Evaluate tools and models	K5: Evaluate	4	Internal- Test Assignment End Term Theory
CO3	CO 3 Demonstrate the conceptual knowledge at the time of final placements	K3 Applying	5	Internal- Test, Assignment End Term- Theory
CO4	CO 4 Develop and Analyze confidence for problem solving and decision making in their core functional area.	K6 Create	6	Internal- Project, Assignment End Term- Theory
CO5	CO 5 Remember of Basic Course in the specific domain	K1 Remember	3	Internal- Project, Assignment End Term- Theory

Session Plan

Sr. No	Hrs	Units	Cos	Topics Mapped with CO	Evaluation Tools
1	6.5	Revision of Basic Course in the specific domain	CO1 Refresh conceptual knowledge of the functional domain	K2: Understand	Internal - Test End Term Theory
2	**3.5**				
		Revision of Specialise Courses	CO 3 Demonstrate the conceptual knowledge at the time of final placements	K3 Applying	Internal - Test End Term Theory
3	**6.5**				
		Test / Viva of basic courses			
			CO 5 Remember of Basic Course in the specific domain	K1 Remember	Internal- Assignment End Term- Theory
4	2.5				
		Test / Viva Special courses	CO 4 Develop and Analyze confidence for problem solving and decision making in their core functional area.	K6 Create	Internal - Test End Term Theory

5	3	Overall Feedback & Action Plan	CO 2 Evaluate tools and models	K5 Evaluate	Internal- Project, Assignment End Term- Theory

Mapping COs with POs

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / Pos	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	-	-	1	-
CO2	3	-	-	1	-
CO3	3	2	1	-	-
CO4	3	1	1	1	2
CO5	2	-	1	1	2
CO	**2.8**	**1.5**	**1.0**	**1.0**	**2.0**

Pedagogy

- ☐ Lecture
- ☐ Presentations
- ☐ Discussions – Case Studies

Evaluation

Internal	40%
External	60%
Total	**100%**

Parameters of Internal Assessment:

- ☐ Attendance
- ☐ Class Participation
- ☐ Class Test

- ❒ Projects / Assignments

Assessment Mapping

Parameter	Marks	CO 1	CO 2	CO 3	CO 4	CO 5
Internal	**20**	**10.0%**	**20.0%**	**30.0%**	**20.0%**	**20.0%**
Class Test	5	20.0%	20.0%	20.0%	20.0%	20.0%
Project / Assignment	5	0.0%	0.0%	20.0%	40.0%	40.0%
Attendance	5	20.0%	20.0%	20.0%	20.0%	20.0%
Class Participation	5	20.0%	20.0%	20.0%	20.0%	20.0%
End Term	**30**	**10.0%**	**10.0%**	**30.0%**	**30.0%**	**20.0%**
Total	**50**	**15.0%**	**15.0%**	**30.0%**	**25.0%**	**20.0%**

Text Book

Book Title	Name of Author	Publisher	Edition No.	Year
	Sanjay Phadke	Sage	1st	2020

Reference Book

Book Title	Name of Author	Publisher	Edition No.	Year

E-Books

Book Title	Name of Author	Publisher	Link	Year

Course Code : **3000354**

Course Name **:** **Placement Readiness Module**

Credit : **4**

Credit Hours : **40 Hrs.**

Course Description

Having taught all the relevant topics in the previous 2 Semesters, this Course will focus more on practicing questions. Each module will have topic revision followed by practice tests. The course is divided into 13 parts, each part covering the important module from the arithmetic and reasoning section. Apart from training in classes, they will be solving 750+ questions in total, during the sessions, which will confirm their progress.

Contents:

- Revision
- Data Sufficiency
- Visual Reasoning
- Logical Deduction
- Doubt Clearing Sessions
- Mock Tests
- Essay Writing
- Corporate Jargons
- Spotting Errors

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
CO1	C01- Apply the concepts of Quantitative aptitude for successful placements in the corporates	**L2 -Understand**	**15**	Internal Test,
CO2	C02- **Understand** different placement practice techniques w.r.t Clock and Calendar to strengthen the problem solving ability	**L2 -Understand**	5	Internal Test,
CO3	CO3- Analyze the given data logically with appropriate reasoning to deduce the results accurately.	**L3 - Apply**	7.5	Internal Test,
CO4	CO4: Develop the ability to critically analyse a given situation and work to arrive at the most suitable solution during the placement process.	**L3 - Apply**	7.5	Internal Test,
CO5	CO5: Apply rules of grammar and deduction techniques to solve grammatical portion in placement process	**L4 - Analyse**	5	Internal Test,

The CO – PO Correlation matrix for the subject is given below:
1 – Low, 2 – Medium, 3 – High, 0 – Low

CO Code	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	1	1	2	3	1
CO2	1	3	-	2	1
CO3	1	2	1	3	1
CO4	1	3	-	1	1
CO5	2	3	-	1	1
CO					

SESSION-WISE COURSE OUTLINE

Session	Hours	Topics	CO	Cognition	Evaluation Tool
1	1.25	**Corporate Jargons**	CO5: Apply rules of grammar and deduction techniques to solve grammatical portion in placement process	Understand	Internal Test,
2	1.25	**Essay Writing** (Format, types, Approaches, dos & don'ts,)	CO5: Apply rules of grammar and deduction techniques to solve grammatical portion in placement process	Understand	Internal Test,
3-4	2.5	**Spotting Errors** (Sentence correction using parts of speech, tenses)	CO5: Apply rules of grammar and deduction techniques to solve grammatical portion in placement process	Understand	Internal Test,
5-6	2.5	**Revision**: Recap of concepts learnt in semester 1 and 2	C02- **Understand** different placement practice techniques w.r.t Clock and Calendar to strengthen the problem solving ability	Understand	Internal Test,
7-8	**2.5**	**Doubt Clearing Session**: Problems based on students' doubts	C02- **Understand** different placement practice techniques w.r.t Clock and Calendar to strengthen the problem solving ability	Understand	Internal Test,
9-10	**2.5**	**Data Sufficiency**: Basic Concepts, Tricks and Questions	CO3- Analyze the given data logically with appropriate reasoning to deduce the results accurately.	Analyze	Internal Test,
11-12	**2.5**	**Visual Reasoning**: Basic Concepts, Tricks and Questions	CO3- Analyze the given data logically with appropriate reasoning to deduce the results accurately.	Analyze	Internal Test,
13-14	2.5	**Logical Deduction**: Basic	CO3- Analyze the	Analyze	Internal Test,

		Concepts, Tricks and Questions	given data logically with appropriate reasoning to deduce the results accurately.		
15-16	2.5	**Mock Test 1**: Mock Test for preparation of placements process	C01- Apply the concepts of Quantitative aptitude for successful placements in the corporates.	Apply	Internal Test,
17-18	2.5	**Mock Test 2**: Mock Test for preparation of placements process	C01- Apply the concepts of Quantitative aptitude for successful placements in the corporates.	Apply	Internal Test,
19-20	2.5	**Mock Test 3**: Mock Test for preparation of placements process	C01- Apply the concepts of Quantitative aptitude for successful placements in the corporates.	Apply	Internal Test,
21-22	2.5	**Mock Test 4**: Mock Test for preparation of placements process	C01- Apply the concepts of Quantitative aptitude for successful placements in the corporates.	Apply	Internal Test,
23-24	**2.5**	**Psychometric Test:** Concepts and work sheets	CO4: Develop the ability to critically analyse a given situation and work to arrive at the most suitable solution during the placement process	Apply	Internal Test,
25-26	**2.5**	**Guesstimate:** Basic Concepts	CO4: Develop the ability to critically analyse a given situation and work to arrive at the most suitable solution during the placement process	Apply	Internal Test,
27-28	**2.5**	**Situation Reaction Test:**	CO4: Develop the ability to critically	Apply	Internal Test,

		Problems based on various situations and how to handle	analyse a given situation and work to arrive at the most suitable solution during the placement process		
29-32	**5**	**Magic Maths:** Application of PICA and various other Short trick methods	C01- Apply the concepts of Quantitative aptitude for successful placements in the corporates.	Apply	Internal Test,

Pedagogy	
1. Lecture	
2. Practice exercises	
Evaluation:	
Internal	60%
External	40%
Total	100%

Parameters of Internal Assessment:
1. Class Test
2. Class Participation
3. Attendance

Assessment Mapping

Parameter	Marks	CO 1	CO 2	CO 3	CO 4	CO 5
Attendance	10					
Class Participation	15					
Class Test 1(quants)	20	50%	50%	20%	10%	
Class Test 2 (quants)	20	25%	25%	25%	25%	
Assignment	15			30%	70%	

Class Test 3 (Verbal)	20					100%

Reference Book:
R.S. Agarwal - First Edition: 1989
Uma Maheshwari- GACP - First Editor

Course Code :

Course Code :
Course Title : Corporate Transition Module
Semester : III
No. of Credits : 4
Contact Hours :40 hrs.

Course Description:

The course would bring out the importance of learnings derived during the Internship period and to blend these learnings in an effective manner to achieve excellence in the selection process during final placements. It would expose the students to various practice sessions of Group Discussions and PI rounds. Finally, the course would help the students to be able to blend their classroom learnings and their experiential learnings to make a successful overall impact in the campus placement process.

Content

- Road map
- Building Effective Resumes_ITM & ATS
- Group Discussion Techniques / Trending topics
- Personal Interview Techniques
- Mock Interviews

Cos	Description	Cognition	Hours	Evaluation Tools
CO1	Analyze their readiness w.r.t HR, technical, specialization specific questions for the campus placement process	L2- Understand	1	
CO2	Develop the ability to critically analyse a given situation and work to arrive at a most suitable solution during an interview.	L3- Apply	4	
CO3	Formulate plan of action to crack abstract, case based and other types of group discussions	L3- Apply	8	**Internal** **Group discussion**
CO4	Apply attributes of ATS format and increase their chances of receiving revert on their online job applications	L3- Apply	1	
CO5	Classify details of their internship on the ITM resume template in a way that describes their tasks, skills, gained experiences and measurable achievements effectively	L4- Analyze	2	

Mapping COs with POs

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / Pos	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	3	3	3	

CO2	1	3	2	2	-
CO3	3	3	3	3	
CO4		3	3	1	
CO5		3	3	1	
	2.3	3	2.8	2	

Session Plan

Session No	Hrs	Topic	COs	Cognition	Evaluation Tools
1	1	Roadmap & Placement Guidance for career growth	CO1 Compare industries and sectors & eventually take a decision about the profiles and industries of their choice	Understand	
2	1	Resume - ITM format	CO5 - Classify details of their internship on a resume in a way that describes their tasks, skills, gained experiences and measurable achievements effectively	Analyze	
3		Video Resume			
4-5		Resume Review	CO5 - Classify details of their internship on a resume in a way that describes their tasks, skills, gained experiences and measurable achievements effectively		
6	2	Resume_ATS	CO4- Apply attributes of ATS resume format and increase their chances of receiving revert on their online job applications	Apply	

7-9	4	Mock GD	CO3 -Formulate the plan of action to crack abstract, case based and other types of group discussions	Apply	
10-12	4	Mock GDs Assessment	CO3- Formulate plan of action to crack abstract, case based and other types of group discussions	Apply	
13-14	3	Overview of PI - Situation Based Questions (Domain & HR) - Students Panel	CO2 - Develop the ability to critically analyse a given situation and work to arrive at a most suitable solution during an interview.	Apply	
15-32		Mock PI – Talewind Faculty & Alum			

Pedagogy
1. Lecture
2. Company overview
3. News/Article Analysis
4. Mock Personal Interview
5. Videos

Evaluation:	
Internal	40%
External	60%
Total	100%

Parameters of Internal Assessment:

- Mock Interviews
- Attendance
- CLass Participation

Assessment Mapping

Parameter	Marks	CO 1	CO 2	CO 3	CO 4	CO 5

Internal	40	15%	18%	22%	24%	21%
Attendance	10	20%	20%	20%	20%	20%
Class Participation	10	20%	20%	20%	20%	20%
Mock Interview	20	25%	25%	-	25%	25%
End Term	**60**	20%	20%	20%	20%	20%

Textbook:
Study material provided by Concerned Faculty

Reference Books:
1) Interviews and GD – GK Publication
2) GD and Interview – R. Gupta and Anand Gaugaly
3) How to succeed in GD and Interview - SK Mondal

Course Title : Capstone Project Phase II
Semester : III
No of Credit : 2
Duration : 20 hrs

PROGRAM OUTCOMES

1.Generate conceptual knowledge regarding business management.

2. Apply knowledge of management theories and practices to solve business problems.

3. Foster Analytical and critical thinking abilities for data-based decision making.

4. Ability to develop value based leadership ability.

5. Ability to understand, analyze and communicate global, economic, legal, and ethical aspects of business.

6. Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment.

7. Ability to conduct interdisciplinary research.

8. Equip with knowledge and skills for transition from campus to corporate.

		Course Outcome :	Capstone Project Phase II		
		Course outcome	After the completion of the projects students should be able to	Cognition	Remarks
			CO1 :Students will be able to develop a procedure for data collection through designing instruments	**L4 : Apply**	
			CO2: Able to collect and classify relevant and reliable primary and secondary data for the study	Analyse	
			C03: Able to analyse data and derive meaning to teach a logical conclusion	Analyse	
			CO4 : Develop critical thinking for interpretation of the data	Analyse	

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

CO Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	3	3	1	3	2	3	2
CO2	3	3	3	1	3	2	3	2
CO3	3	3	3	1	3	2	3	3
CO4	3	3	3	2	3	2	3	3
PO attainment	4	4	4	1.25	4	2	4	2.5

Semester IV

Course Title : Capstone Project Final
Semester : IV
No of Credit : 4
Duration : 40 hrs

PROGRAM OUTCOMES

1.Generate conceptual knowledge regarding business management.

2. Apply knowledge of management theories and practices to solve business problems.

3. Foster Analytical and critical thinking abilities for data-based decision making.

4. Ability to develop value based leadership ability.

5. Ability to understand, analyze and communicate global, economic, legal, and ethical aspects of business.

6. Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment.

7. Ability to conduct interdisciplinary research.

8. Equip with knowledge and skills for transition from campus to corporate.

		Course Outcome :	Capstone Project – Final		
		Course Outcomes	After the completion of the project students should be able to	Cognition	Remarks
			CO1 : Students will be able to examine real world problems by integrating technical and management theories and concept	Analyse	
			CO2 : The ability to infer and integrate information to come to a logical conclusion	Analyse	
			CO3 : Students will be able to provide , suggestions and recommendation for the reserach problem	Create	
			CO 4 : Students will be	Evaluate	

			able to conclude research outcomes in a standard report format		
			CO5 : Students will be able to appraise and communicate the research outcomes in a comprehensive and concise manner through a formal presentation	Evaluate	

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

CO Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	3	1	1	2	1	2	1
CO2	3	3	3	1	3	2	2	1
CO3	3	3	3	1	3	2	3	1
CO4	3	3	3	1	3	2	3	1
CO 5	3	3	3	2	3	2	3	3
PO attainment	3	3	2.6	1.2	2.8	1.8	2.6	1.4

Course Code : ????
Course Title : Artificial Intelligence
Semester : IV
Credit : 2
Duration : 20 hrs (75 minutes per session)

Course Description

Artificial Intelligence (AI) is a broad and fast-growing subfield of Computer Science concerned with the construction of Intelligent Agents. This course provides an overview of methods, history, and impact of AI. It covers problem solving, heuristic search, planning, game playing, reasoning with propositional and predicate logic, reasoning under uncertainty, machine learning, applications (natural language processing, vision, robotics, as time permits). Students will solve a variety of AI problems using Python.

Course Outcomes	Description	Cognition	Hours	Evaluation Tools
After the completion of course, students should be able to				
CO1	Describe AI, its applications, use cases.	**K2 -Understand**	**3**	Internal Test End Term- Theory
CO2	Discuss artificial intelligence techniques and their applications to create automated systems that can train large volumes of data of businesses.	**K2 -Understand**	**8.25**	Internal Test End Term- Theory, Case Studies
CO3	Implement advanced concepts covering artificial neural networks, layers of data abstraction and Tensor Flow to solve real time problems and deliver tangible business benefits.	**K-3 Apply**	**5**	Internal Assignment End Term- Theory, Case Studies
CO4	Sketch a small AI system in a team environment to develop a basic understanding of the building blocks of AI as presented in terms of intelligent agents.	**K-3 Apply**	**1.75**	Internal Assignment End Term- Theory, Case Studies
CO5	Defend the business value of artificial intelligence in various sectors to derive value propositions for organizations.	**K-5 Evaluate**	**2.00**	Internal Assignment End Term- Theory, Case Studies

Mapping COs with POs

Scale 1- low alignment, 2- Moderate alignment, 3 – high alignment, - – No alignment

COs / POs	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	-	-	-	-
CO2	-	-	-	2	-
CO3	-	-	3	-	-
CO4	-	-	3	-	-
CO5	-	-	3	-	-

Course content:

- Formulate search problems and implement search algorithms using admissible heuristics.
- Formulate constraint satisfaction problems and find solutions using constraint graphs.
- Describe games as adversarial search problems and implement optimal and efficient solutions.
- Formulate First Order Predicate Logic
- Learn and formulate Fuzzy Logic

Session Plan:

Sr.NO	Hours	Units	COs	Topics Mapped with CO	Evaluation Tools
1,2	2.5	Introduction to Artificial Intelligence – A brief review of AI history, What is artificial intelligence?, Scope of this course	CO1	**K2 -Understand**	Internal Test End Term- Theory
3,4	2.5	Problem formulation -Review of tree structure Review of graph structure Graph implementation	CO2	**K2 -Understand**	Internal Test End Term- Theory

		State space representation Search graph and search tree			
5	1.25	Evaluation I	CO1,CO 2	**K2 -Understand**	Internal Test End Term-Theory
6,7	2.5	Simple Search Algorithms- Random search Search with closed list Search with open list Depth-first and breadth-first search again Uniform-cost search Teams	CO2	**K2 -Understand**	Internal Test End Term-Theory
8,9	2.5	Heuristic Search, Ontology, Propositional logic- What are heuristics? What is heuristic search? Best first search A* algorithm Generalization of search problems What is ontology? Semantic network Frame Structural knowledge Declarative knowledge Procedural knowledge Propositional logic Definition of logic formula Meaning of logic formula Classification of logic formula Proof based on truth table Basic laws Clausal form/Conjunctive	CO2	**K2 -Understand**	Internal Test End Term-Theory

		canonical form Formal proof			
10,11	2.5	First Order Predicate Logic – Predicate logic Term and logic formula Clausal form/Conjunctive canonical form Standardization of logic formula Unification and resolution Horn clause and Prolog	CO3	**K-3 Apply**	Internal Assignment End Term- Theory, Case Studies
12,13	2.5	Fuzzy Logic: Human-like decision making- Definition of fuzzy set Membership function Notation of fuzzy set Operations of fuzzy set Fuzzy number and operations Extension principle Fuzzy rules De-fuzzification Fuzzy control	CO3	**K-3 Apply**	Internal Assignment End Term- Theory, Case Studies
14,15,16	3.75	Project	CO4,CO5	**K-3 Apply**	Internal Assignment End Term- Theory, Case Studies

Pedagogy

1. Lecture
2. Case Study
3. News/Article Analysis
4. Live Activity/Exercise
5. Videos

Modes of Evaluation & Examination Scheme:

Evaluation:	
Internal Assessment	20 Marks
External Assessment	30 Marks
Total	50 Marks

Internal Assessment:	
Class Attendance	5 Marks
Class Participation	5 Marks
Class Test	5 Marks
Assignment	5 Marks

External Assessment:	
End Term Examination	30 Marks

Assessment Mapping:

Parameter	Marks	CO-1	CO-2	CO-3	CO-4	CO-5
Internal	20	31%	39%	11%	9%	11%
Class Attendance	5	20%	20%	20%	20%	20%
Class Participation	5	20%	20%	20%	20%	20%
Class Test	5	50%	50%	0%	0%	0%
Assignment	5	0%	37.50%	25.00%	12.50%	25%
End Term	30	75%	0%	0%	0%	25%

Text Book:
Innovation Management, Allan Afuah, Oxford Publication, 2nd Edition, 2009

Reference Books:

1) Managing & Shaping Innovation, Steve Conway & Fred Steward, Oxford, University Press, 2009

2) Creativity: Get Inspired, create ideas and make them happen now!, Wolff, Pearson Education.

3) Innovation Management and New Product Development, Trott, Pearson Education, 4th Edition.

E-Books:

1) Competencies, innovation and entrepreneurship in the theory and practice of management
http://www.wsb.edu.pl/container/Wydawnictwo/projektowe/competencies.pdf

2) Designing a Curriculum in Design Thinking for Creative Problem Solving Users-Helen A.Kahen
http://digitalcommons.buffalostate.edu/cgi/viewcontent.cgi?rticle=1114&context=creativeprojects

3) The Oxford Handbook of Creativity ,Innovation and Entrepreneurship

http://31.210.87.4/ebook/pdf/The_Oxford_Handbook_of_Creativity_Innovation_and_Entrepreneurship.pdf