

*PGDM in Business Analytics, St. Teresa's College (Autonomous), Ernakulam*

**ST. TERESA'S COLLEGE (AUTONOMOUS)  
ERNAKULAM**

**Affiliated to Mahatma Gandhi University, Kottayam**



**CURRICULUM FOR  
PGDM IN BUSINESS ANALYTICS**

**Under Credit & Semester System  
(2025 Admissions Onwards)**

**ST. TERESA'S COLLEGE (AUTONOMOUS), ERNAKULAM**  
**BOARD OF STUDIES OF DEPARTMENT OF MANAGEMENT STUDIES**

**LIST OF MEMBERS**

<b>SL No.</b>	<b>Name</b>	<b>Official Address</b>	<b>Designation</b>
1.	Ms. Namitha Peter	Assistant Professor and HOD, Department of Management Studies, Central Block, St Teresa's College, Ernakulam	Chairperson
2.	Dr. Santhosh Kumar S	Professor, School of Management Studies, CUSAT	Subject Expert outside M.G. University
3	Dr. Sam Thomas	Professor, School of Management Studies, CUSAT	Subject Expert outside M.G. University
4	Dr. Daly Paulose Meppurath	Assistant Professor, School of Management Studies, CUSAT	University Nominee (Expert outside College)
5	Dr. Pradeep S	Assistant Vice President - Learning & Development, Nest Digital Academy Plot No. 2, Cochin Special Economic Zone(CSEZ), Kakkanad, Cochin – 682 037	Representative from Industry
6	Ms. Nandana Harilal	Assistant Professor, Fashion Design and Management, MES College, Marampally	Alumni Representative
7	Dr Anu Raj	Assistant Professor, Department of Management Studies, Central Block, St Teresa's College, Ernakulam	Faculty Member
8	Ms. Geethu Krishna	Assistant Professor, Department of Management Studies, Central Block, St Teresa's College, Ernakulam	Faculty Member

9	Dr Shobita P S	Assistant Professor, Department of Management Studies, Central Block, St Teresa's College, Ernakulam	Faculty Member
10	Dr Sunitha T R	Assistant Professor, Department of Management Studies, Central Block, St Teresa's College, Ernakulam	Faculty Member
11	Dr Minu Mary Joseph	Assistant Professor, Department of Management Studies, Central Block, St Teresa's College, Ernakulam	Faculty Member
12	Ms. Sahya Sunny	Assistant Professor, Department of Management Studies, Central Block, St Teresa's College, Ernakulam	Faculty Member

**MINUTES OF THE BOARD OF STUDIES MEETING OF THE**  
**DEPARTMENT OF MANAGEMENT STUDIES**  
**HELD ON 11<sup>th</sup> MARCH 2025**

This is to certify that the revised syllabus of the Department of Management Studies for 2025 admissions onwards has been scrutinized and approved at the Board of Studies Meeting which was held on 11.03.2025. The complete revised syllabus of PGDM in Business Analytics programme was presented before the Board of Studies and discussed in detail. The revised syllabus was approved by the Board of Studies

The following members attended the meeting.

1. Mrs. Namitha Peter, Assistant Professor and HOD, Department of Management Studies, St. Teresa's College
2. Dr. Santhosh Kumar S, Professor, School of Management Studies, CUSAT
3. Dr. Sam Thomas, Professor, School of Management Studies, CUSAT
4. Dr. Daly Paulose Meppurath, Assistant Professor, School of Management Studies, CUSAT
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10. Dr. Sunitha T R, Assistant Professor, Department of Management Studies, St. Teresa's College
11. Dr. Minu Mary Joseph, Assistant Professor, Department of Management Studies, St. Teresa's College

**FACULTY OF THE DEPARTMENT WHO HAVE CONTRIBUTED**  
**TOWARDS CURRICULUM AND SYLLABUS IN**  
**PGDM IN BUSINESS ANALYTICS**

1. **Ms. Namitha Peter**, Assistant Professor and HOD, Department of Management Studies, Central Block, St. Teresa's College (Autonomous), Ernakulam.
2. **Dr. Anu Raj**, Assistant Professor, Department of Management Studies, Central Block, St. Teresa's College (Autonomous), Ernakulam.
3. **Ms. Geethu Krishna P G**, Assistant Professor, Department of Management Studies, Central Block, St. Teresa's College (Autonomous), Ernakulam.
4. **Dr. Shobita P S**, Assistant Professor, Department of Management Studies, Central Block, St. Teresa's College (Autonomous), Ernakulam.
5. **Dr. Sunitha T R**, Assistant Professor, Department of Management Studies, Central Block, St Teresa's College (Autonomous), Ernakulam.
6. **Dr. Minu Mary Joseph**, Assistant Professor, Department of Management Studies, Central Block, St Teresa's College (Autonomous), Ernakulam.
7. **Ms. Sahya Sunny**, Assistant Professor, Department of Management Studies, Central Block, St Teresa's College (Autonomous), Ernakulam.

## **ACKNOWLEDGEMENT**

I acknowledge with gratitude all the guidance and help given by our Directors, Rev.Sr.Tessa CSST and Rev. Sr. Francis Ann CSST and Principal, Prof. Dr.Alphonsa Vijaya Joseph during the course of restructuring the syllabus of Post Graduate Diploma in Fashion Designing. I also remember and acknowledge with gratitude all the members of the Board of Studies for their constructive suggestions and contributions in restructuring of all the courses of this Post Graduate Diploma Programme. I thank all the faculty members of the Department, for taking great effort to prepare this syllabus. I am also grateful to all the members of the Curriculum Committee of the college for their guidance during the syllabus framing process. Above all, I bow my head before God Almighty for all the guidance he has continuously given to us in all our endeavours.

**Mrs. NAMITHA PETER**

**HEAD OF THE DEPARTMENT**

**CHAIRMAN**

**BOARD OF STUDIES OF DEPARTMENT OF MANAGEMENT STUDIES**

## **PREFACE**

As an autonomous institution under Mahatma Gandhi University, St. Teresa's College is committed to enhancing its curriculum while adhering to the essential guidelines set by the University and Higher Education Council. Our aim is to cultivate a well-rounded educational experience. Within the framework of the prescribed syllabi, we have unified our efforts to foster an inspiring academic environment that empowers both teachers and students to delve deeper into knowledge and contribute to its dissemination and growth. It is crucial to emphasize that the generation and sharing of Quality Knowledge—which is vital for the growth and development of students and society as a whole—constitute the core mission of any educational institution. The revised syllabi of our programs are designed in such a way to offer students innumerable opportunities for authentic, real-world learning experiences that will enhance their reasoning, creativity, intelligence and problem-solving abilities. This approach will enable them to attain knowledge of universal significance and relevance, fostering personal growth, civic responsibility, economic proficiency and the overall welfare of community, society and world at large.

We would like to acknowledge the dedication of our teachers in restructuring the syllabi and defining course outcomes that prioritize the cognitive and intellectual development of our learners. This initiative instils the confidence necessary for them to conduct independent and scholarly research in their areas of professional interest, positioning them as effective global cross-cultural educators.

We extend our congratulations to the Prof. Dr. Alphonsa Vijaya Joseph, Principal, Dr. Kala M.S., Dean of Self Financing, Dr. Mary Liya C.A, Faculty Coordinator for syllabus revision, who have effectively coordinated the syllabus restructuring across all programs. We strive to transform lives and make a meaningful impact both locally and globally through the creation, sharing, and application of knowledge. We look forward to sharing the outcomes of our curriculum restructuring and hope that these resources will inspire reflection on the advancements in learning within our institution, as well as contribute to the global educational landscape.

**Sr. Tessa CSST & Sr. Francis Ann CSST**

Directors, St. Teresa's College

## **FOREWORD**

Autonomy in higher education signifies a commitment to responsibility and accountability, which ultimately fosters excellence in academics and proactive governance. St. Teresa's College was granted autonomous status in 2014, and since then, we have made concerted efforts to uphold a high standard of quality in the education we provide. In 2019, the college achieved re-accreditation by NAAC with an A++ grade (CGPA 3.57).

This academic autonomy has empowered us to refine our syllabus to meet the evolving needs of today's students. The current educational landscape presents numerous challenges, and it is essential that our curricula and syllabi reflect the significant shifts occurring across various disciplines. To this end, we have gathered structured feedback from students, alumni and industry experts, incorporating their suggestions into our syllabi.

Our Board of Studies, established for each department, meets regularly within the designated timeframe to engage in thorough discussions regarding various aspects of the curricula and syllabi. The IQAC team has facilitated numerous workshops and conferences to equip our faculty with the necessary skills to design syllabi and formulate question papers for internal assessments, ensuring that the learning outcomes outlined in the syllabus are met and that examinations are conducted fairly and transparently.

The responsibilities that come with our autonomy are indeed substantial, but we have united in our efforts to tackle the challenges that arise. Our focus has been on shaping young women into responsible citizens who will contribute to nation-building in exemplary ways. To enhance industry-academia linkage and ensure students are placement-ready, the curriculum will emphasize the importance of internships and application-oriented research projects, fostering a sense of social responsibility and equipping students with practical skills to facilitate entrepreneurship. We are dedicated to nurturing their academic aspirations alongside their skills in co-curricular activities. To align with the needs of the new generation of students, we plan to restructure our postgraduate programs in the upcoming academic year.

I extend my heartfelt gratitude for the unwavering support and guidance provided by Rev. Sr. Tessa CSST and Rev. Sr. Francis Ann CSST, the Directors of the College. I would also like to express my special thanks to the team led by Dr. Kala M.S and Dr. Mary Liya C.A. for coordinating the syllabus restructuring of our programs, as well as to the Heads of Departments and all faculty members for their dedication, commitment and exceptional contributions to this important initiative.

**PROF. ALPHONSA VIJAYA JOSEPH**  
**PRINCIPAL**

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## **PREAMBLE**

The aim of the Postgraduate education is to provide high quality education as well as a supportive learning environment for the students to reach their full academic potential. The higher education has to inculcate in students the spirit of hard work and research aptitude to pursue further studies in the nationally/internationally reputed institutions as well as prepare them for a wider range of career opportunities in interdisciplinary fields.

The Board of Studies of the Department of Management Studies has restructured the syllabi for PGDM in Business Analytics to monitor, review and enhance educational experience which ensures that the Post Graduate Education remains intellectually demanding and relevant to current needs of Analytics graduates. The thrust is given in fostering a friendly and stimulating learning environment which will motivate the students to reach high standards, enable them to acquire real insight into the application of analytics techniques and become self-confident, committed and adaptable graduates. With this in mind, we aim to provide a firm foundation in every aspect of Business Analytics and to develop analytical, experimental, computational, logical and reasoning skills of students.

The Board of Studies acknowledges and appreciates the good effort put in by the faculty members of the Department of Management Studies to restructure the syllabus for PG Diploma in Management in Business Analytics in the institution which will be implemented for the admissions from 2025 onwards.

## **PROGRAMME OUTCOMES (POs) OF** **POSTGRADUATE PROGRAMMES**

The integration of Outcome-Based Education (OBE) stands as a cornerstone of the postgraduate programmes at St. Teresa's College (Autonomous), Ernakulam, with the Programme Outcomes (POs) intricately aligned to the vision and mission of the college. By adopting OBE, the institution meticulously cultivates graduates who are not only equipped with advanced knowledge and critical skills but are also adept in addressing professional challenges, contributing to society, and embracing lifelong learning, thereby fostering well-rounded, responsible individuals committed to excellence in their fields. The POs for the post graduates of St. Teresa's college are listed below:

### **PO1: Advanced Knowledge and Application**

Graduates will demonstrate an advanced and integrated understanding of their discipline, to effectively apply this knowledge to solve complex, real-world challenges, showing originality in developing innovative solutions that contribute to their field and to society.

### **PO2: Critical Thinking and Analytical Skills**

Graduates will critically evaluate complex problems, synthesize information from diverse sources, and employ advanced analytical reasoning to formulate evidence-based solutions in line with contemporary needs.

### **PO3: Research and Innovation**

Graduates will be able to conduct independent, original research using appropriate scientific or creative methodologies, thereby contributing new knowledge or insights to implement innovative practices and provide solutions to the issues of contemporary world.

### **PO4: Interdisciplinary and Collaborative Skills**

Graduates will collaborate effectively in interdisciplinary and multicultural teams, leveraging the strengths of various disciplines to address multifaceted problems, reflecting the global best practice of professionals who can operate in diverse group settings.

**PO5: Communication Skills**

Graduates will be skilled in articulating their ideas, research findings, and solutions clearly and effectively in both oral and written formats, ensuring engagement and understanding across diverse audiences.

**PO6: Technological Proficiency and Innovation**

Graduates will be proficient in using modern technologies and digital tools relevant to their field, applying technological innovations to enhance research, professional practice, and societal well-being, and ensuring they remain at the cutting edge of their discipline.

**PO7: Global Awareness and Societal Engagement**

Graduates will integrate knowledge of global trends, cultural diversity, and sustainable development principles into their work, actively engaging with society to promote inclusivity, equity, and environmental stewardship in line with global citizenship values.

**PO8: Ethical and Professional Responsibility**

Graduates will uphold the highest standards of ethics and professionalism in all their academic and professional endeavours and will make informed decisions that reflect integrity and ethical consideration, including respect for diverse perspectives and awareness of the social and environmental implications of their actions.

**PO9: Advocacy for Social Justice and Inclusive Development**

Graduates will leverage their knowledge, skills, and experiences to advocate for social justice, equality, and the empowerment of marginalized communities, engaging in initiatives that promote inclusive and sustainable development, thereby contributing to the well-being of society

**PO10: Lifelong Learning and Professional Development**

Graduates will embrace a mindset of lifelong learning, continually adapting to new technologies and societal needs by proactively seeking new learning opportunities and adapt to emerging technologies and evolving industry trends, engaging in ongoing professional development to remain at the forefront of their field.

## **PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)**

The PGDM in Business Analytics programme prepares graduates to achieve key objectives within a few years of completion, focusing on professional success, societal contributions, and lifelong learning. The Programme Educational Objectives (PEOs) of the PGDM in Business Analytics programme, outlined below, are designed to equip graduates with the skills and knowledge for continued growth and advancement in the field of Business Analytics.

**PEO1:** Graduates will have a wide range of career prospects in various industries that rely on data to make informed business decisions

**PEO2:** Graduates will have in-demand technical skills that will provide them with a competitive advantage in their career pursuit

**PEO3:** Graduates will thrive in data-driven roles, positioned as key decision makers within organizations

## **PROGRAMME SPECIFIC OUTCOMES**

The Department of Management Studies is committed to provide an enriched educational experience to develop the knowledge, skills and attributes of students to equip them for life in a complex and rapidly changing world.

On completion of the Post Graduate Diploma in Management in Business Analytics, our students should be able to demonstrate the programme outcomes listed below:

**PSO1:** Develop data mining and statistical skills to analyse data, detect patterns and draw inference (Apply)

**PSO2:** Illustrate proficiency in programming languages to manipulate, clean and analyse data using Excel, SPSS, R, Python and SAS (Analyse)

**PSO3:** Evaluate descriptive, predictive, and prescriptive analytics methods related to the functional areas of finance, marketing, HR and supply chain management (Evaluate)

**PSO4:** Construct visually appealing graphics to convey data insights using tools like SPSS, SAS, Excel, Power BI, and Tableau (Apply)

**PSO5:** Recommend specific analytical solutions to address business problems (Evaluate).

### **Job Opportunities**

A Postgraduate (PG) course in Business Analytics opens up a wide range of career opportunities across industries, as businesses increasingly rely on data-driven decision-making. Here are some key job roles that graduates can pursue:

- Business Analyst – Analyzes business problems and provides data-driven insights.
- Data Analyst – Works with structured data to generate reports, dashboards, and trends.
- Data Scientist – Applies machine learning and statistical techniques to solve complex business problems.
- Marketing Analyst – Analyzes customer behavior and optimizes marketing campaigns.
- Financial Analyst – Uses data to assess financial trends and risk management.
- HR Analyst – Uses data to assess workforce trends, employee performance, and organizational effectiveness.

### **Eligibility for admission:**

Graduates of any degree who have passed the qualifying examination in CBCSS pattern should possess CGPA of not less than 4.5 out of 10.00 in the Core Group (core plus open and complementary courses). Graduation in any stream with at least 45% marks in main and subsidiary subjects under part III. Candidates who have passed the qualifying examination in CBCSS (2009) pattern should possess CGPA of not less than 1.80 out of 4.00 in the Core Group (core plus open and complementary courses). Candidates who have passed the qualifying examination in CBCSS (2013) pattern should possess a CGPA of not less than 4.5 out of 10.00 in the Core Group (core plus open and complementary courses).

**Duration of the Programme:** Four Semesters

**Examination:** Credit and Semester system (CSS)

Direct Grading system with 7point scale

**Medium of instruction and assessment:** English

**Faculty under which the Degree is awarded:** Technology and Applied Sciences

## **PROGRAMME STRUCTURE**

### **STRUCTURE OF PGDM – BUSINESS ANALYTICS**

The programme shall include two types of courses, Core courses and Elective courses. There shall also be a Project and Comprehensive Viva Voce as core courses. The programme also includes assignment/ seminar/ Class tests etc. The total credit for the programme is fixed at 80.

#### **THEORY COURSES:**

There are twelve theory courses and five practical courses spread across the four semesters. The curriculum comprises ten core courses—eight carrying four credits each and two carrying three credits—along with three elective courses offered in the final semester. The three elective courses can be chosen as per the interest of the students, availability of faculty and academic infrastructure. Distribution of courses is as follows. There are twelve core courses common to all students. Semester I and II will have four core theory and one practical course each. Semester III will have three core courses and two practical courses including a project. Semester IV will have one core course, one practical course, three elective courses, a comprehensive viva voce and an internship.

#### **PRACTICAL**

There are five courses that have practical components spread across the four semesters.

#### **PROJECT**

The students undertake a project in the third semester. The project discipline can be chosen by the student and the guide (a faculty of the department). The Project may be started at the beginning of the Semester III, and is evaluated at the end of the Semester III. The Project will be evaluated by one external examiner and one internal examiner.

#### **INTERNSHIP**

The students undergo a two-month internship in the Semester IV. The internship disciplines can be decided by the student and the guide (a faculty of the department). The evaluation is scheduled to the end of the Semester IV to be evaluated by one external and one internal examiner.

#### **COMPREHENSIVE VIVA VOCE**

A comprehensive viva voce examination will be conducted by an external examiner and an internal examiner at the time of evaluation of the internships in semester IV. The components of

viva consist of subject of special interest, fundamental concepts, topics covering all semester and awareness of current and advanced topics.

### **COURSE CODE**

The courses in the programme are coded according to the following criteria. The first two letters of the code indicate the name of programme, i.e., BA stands for Business Analytics. Next digit is to indicate the semester. i.e., BA1 (Business Analytics, 1st semester). This is followed by the letter C or E indicating whether the course is a core course or elective course. (However, in the case of Project/Comprehensive viva voce this letter is omitted.) Next two digits indicate the course number (avoided in the case of Project/Comprehensive viva voce). The letter/letters T/P/PR/V follows it and is used to indicate theory/ practical/ project/ viva. The next letter will be M which indicates that the programme is for masters. The last two digits 25 represent the year in which restructuring is done.

**Example: Theory- BA1C01TM25 and for Practical BA1C01PM25**

**DISTRIBUTION OF COURSES AND CREDITS**

<b>SEM</b>	<b>Course Type</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Hrs. per week</b>	<b>Credit</b>	<b>Total credit</b>
<b>I</b>	Core Theory	BA1C01TM25	Introduction to Business Analytics	5	4	19
	Core Theory	BA1C02TM25	Statistics for Business	5	4	
	Core Theory	BA1C03TM25	Management Concepts and Practices	5	4	
	Core Theory	BA1C04TM25	Accounting for Managers	5	4	
	Core Practical	BA1C01PM25	Spreadsheet Modelling and Decision Analysis	5	3	
<b>II</b>	Core Theory	BA2C05TM25	Data Mining for Business Analytics	5	4	19
	Core Theory	BA2C06TM25	Management Decision Science	5	4	
	Core Theory	BA2C07TM25	Business Research Methods	5	4	
	Core Theory	BA2C08TM25	Business Finance	5	4	
	Core Practical	BA2C02PM25	Analytics with R	5	3	
<b>III</b>	Core Theory	BA3C09TM25	Time Series Econometrics	5	4	20
	Core Theory	BA3C10TM25	Multivariate Data Analysis	5	4	
	Core Theory	BA3C11TM25	Financial Modelling	5	4	
	Core Practical	BA3C03PM25	Data Science using Python	4	3	
	Core Practical	BA3C04PM25	Data Visualization using Tableau & Power BI	4	3	
	Project	BA3PRM25	PROJECT REPORT & VIVA	2	2	
<b>IV</b>	Core Theory	BA4C12TM25	Managerial Economics	5	4	22
	Elective	BA4E01TM25	Marketing	4	3	
		BA4E02TM25	Supply Chain Management			
	Elective	BA4E03TM25	HRM	4	3	
		BA3E04TM25	Entrepreneurship			
	Elective	BA4E05TM25	Strategic Management	4	3	
		BA3E06TM25	International Business			
	Core Practical	BA4C05PM25	Predictive Modelling Using SAS	5	3	
Internship	BA4IM25	Internship	3	4		
Viva Voce	BA4VM25	Viva -Voce		2		
<b>TOTAL CREDITS</b>					<b>80</b>	

**ELECTIVE COURSES**

A	Course code	Course Title	Teaching hours per week	Credit
	BA3E01TM25	Marketing Management	4	3
	BA3E02TM25	Supply Chain Management	4	3

B	Course code	Course Title	Teaching hours per week	Credit
	BA4E03TM25	Human Resource Management	4	3
	BA4E04TM25	Entrepreneurship	4	3

C	Course code	Course Title	Teaching hours per week	Credit
	BA4E05TM25	Strategic Management	4	3
	BA4E06TM25	International Business	4	3

**DISTRIBUTION OF CREDITS**

The total credit for the programme is fixed at 80. The distribution of credit points in each semester and allocation of the number of credits for theory courses, project and viva is as follows. The credit of theory courses is 4 per course in the first, second and third semesters. The core courses in the fourth semester will have 4 credits and elective courses will have 3 credits. The practical courses of Semester I & II, III & IV all have 3 credits. The project and viva voce will have a credit of 2 each. The distribution of credit is shown below.

Semester	Courses	Credit	Total Credits
I	4 Theory Core Courses	4	4 X 4 = 16
	1 Practical Core Course	3	1 X 3 = 3
II	4 Theory Core Courses	4	4 X 4 = 16
	1 Practical Core Courses	3	1 X 3 = 3
III	3 Theory Core Courses	4	3 X 4 = 12
	2 Practical Core Course	3	2 X 3 = 6

	Project	2	1 X 2 = 2
<b>IV</b>	1 Theory Core Course	4	1 X 4 = 4
	1 Practical Core Course	3	1 X 3 = 3
	3 Elective Courses	3	3 X 3 =9
	1 Internship	4	1 X 4 = 4
	1 Comprehensive Viva	2	1 X 2 = 2
<b>TOTAL</b>			<b>80</b>

### **EVALUATION AND GRADING**

The evaluation for each course shall contain two parts such as In-Semester Assessment (ISA) and End Semester Assessment (ESA). The ratio between ISA and ESA shall be 1:3 and 25% weightage shall be given to ISA and 75% to ESA. Both ISA and ESA shall be carried out using direct grading system. Evaluation (Both ISA and ESA) to be done by the teacher is based on a Six-point scales shown in the table below:

<b>GRADE</b>	<b>GRADE POINT</b>	<b>RANGE</b>
A <sup>+</sup>	5	4.50 to 5.00
A	4	4.00 to 4.49
B	3	3.00 to 3.99
C	2	2.00 to 2.99
D	1	0.01 to 1.99
E	0	0.00

Direct Grading System based on a 7 – point scale is used to evaluate the performance of students in both ISA and ESA.

For all courses (theory & practical), semester/ overall programme, the letter grades for **GPA/SGPA/CGPA** and its indicators are given in the following table.

<b>RANGE</b>	<b>GRADE</b>	<b>INDICATOR</b>
4.50 to 5.00	A+	Outstanding
4.00 to 4.49	A	Excellent
3.50 to 3.99	B+	Very good
3.00 to 3.49	B	Good
2.50 to 2.99	C+	Fair
2.00 to 2.49	C	Marginal
0.00 to 1.99	D	Deficient (Fail)

### **IN-SEMESTER ASSESSMENT (ISA)**

The In Semester Assessment is to be done by continuous assessments of the components given below. The components of ISA for theory and practical and their weightage are as in the following tables.

<b>THEORY</b>		<b>PRACTICALS</b>	
<b>COMPONENTS</b>	<b>WEIGHTAGE</b>	<b>COMPONENTS</b>	<b>WEIGHTAGE</b>
Assignment	2	Written / Lab test	3
Seminar	4	Lab involvement and record	1
Test Papers (Average of 2)	4	Viva	1
<b>TOTAL</b>	<b>10</b>	<b>TOTAL</b>	<b>5</b>

The two test papers in the Theory component should be in the same model as the ESA question paper. For test papers, questions shall be set in such a way that the answers can be awarded A<sup>+</sup>, A, B, C, D or E grade.

The performance of students in the seminar and assignment should also be documented in terms of grades. The components for assignments and seminars are as in the following table:

<b>ASSIGNMENT COMPONENTS</b>	<b>SEMINAR COMPONENTS</b>
Punctuality	Content
Content	Presentation

The components of ISA for project and their weightage are as in the following table.

<b>COMPONENTS</b>	<b>WEIGHTAGE</b>
Relevance of the topic and analysis	2
Project content and presentation	2
Project viva	1
<b>TOTAL</b>	<b>5</b>

The ISA of the project is done by the supervising guide of the department or the member of the faculty decided by the head of the department. The supervising guide should keenly and sincerely observe the performance of the student during the course of project work. The supervising guide is expected to inculcate in students, the research aptitude and aspiration to learn and aim high in the realm of research and development. A maximum of two students may be allowed to perform one project work if the volume of the work demands it. Project evaluation begins with (i) The selection of problem, (ii) Literature survey, (iii) Work plan, (iv) Experimental / theoretical setup/data collection, (v) Characterization techniques/ computation/ analysis (vi) Use of modern software for data analysis/experiments (R) and (vi) Preparation of project report. The project internal grades are to be submitted at the end of Semester III.

The components of ISA for comprehensive viva voce and their weightage are as in the following table.

<b>COMPONENTS</b>	<b>WEIGHTAGE</b>
Fundamental concepts	3
Awareness of current /advanced topics	2
<b>TOTAL</b>	<b>5</b>

#### **GENERAL INSTRUCTIONS FOR ISA**

- The In-Semester assessment should be fair and transparent. The responsibility of evaluating the ISA is vested on the teacher(s) who teach the course. The evaluation of the components should be published and acknowledged by students.

- The assignments/ seminars / test papers are to be conducted at regular intervals. These should be marked and promptly returned to the students.
- One teacher appointed by the Head of the Department will act as a coordinator for consolidating grade sheet for ISA in the department in the format provided by the Controller of the examinations. The consolidated grade sheets are to be published in the department notice board, one week before the closing of the classes for ESA. The grade sheet should be signed by the coordinator and counter signed by the Head of the Department and the Principal.
- There shall be no separate minimum grade point for ISA of theory, practical, project and comprehensive viva voce. Though no separate minimum is required for internal evaluation for a pass, a minimum C grade is required for a pass in an external evaluation. And a minimum C grade is required for pass in a course.
- The consolidated grades in specific format are to be kept in the college for future references for 2 years. The consolidated grades in each course should be uploaded to the Institution Portal at the end of each semester as directed by the Controller of Examinations.
- There shall not be any chance for the improvement of ISA grade points.

#### **Grievance Redressal Mechanism for ISA**

There will be provision for grievance redressal at three levels, viz,

1. At the level of teacher concerned,
2. At the level of departmental committee consisting of Head of the Department, Coordinator and teacher concerned,
3. At the level of college committee consisting of the Principal, Controller of Examinations and Head of the Department.

#### **END SEMESTER ASSESSMENT (ESA)**

The End Semester Assessment of all semesters shall be conducted by the institution on the close of each semester. A minimum C grade is required for a pass in ESA. Also in aggregate, a minimum C grade is required for a pass in a course.

Students with less than 73% aggregate attendance during a semester are not eligible to attend ESA of any course.

If a student represents her Institution/ University / State/ Nation in Sports /NCC/ NSS or Cultural or any other officially sponsored activities such as college union/university union etc, she shall

be eligible to claim the attendance for the actual number of days participated subject to a maximum of 15 days in a semester based on the specific recommendations of the Head of the Department or teacher concerned.

For reappearance/ improvement, students may appear along with the next batch.

However, the students who fail in Semester 3 will have the opportunity to appear for a special supplementary (SAVE AN YEAR-SAY) exam conducted at the end of Semester 3.

### **QUESTION PAPER PATTERN FOR THEORY COURSES.**

All the theory question papers are of three hour duration. All question papers will have three parts. The question shall be prepared in such a way that the answers can be awarded the grades A+, A, B, C, D or E.

The questions in each section will be grouped according to the Course Outcomes (COs), with the selection of questions to be answered falling under a single CO. Thus, the mandatory attempt of all COs can be ensured for the calculation of course outcome attainment.

**Part A:** Questions in Part A are very short answer type. A total of eight questions need to be answered, each carrying a weightage of 1, contributing to a cumulative weightage of 8 for the section.

For courses with 4 COs, there will be 4 bunches of 3 questions each, assigned to each CO, and students must answer 2 questions from each bunch.

For courses with 5 COs, there will be 2 bunches of 2 questions each, assigned to the COs assessed in Part C, from which 1 question must be answered. Additionally, 3 bunches containing 3 questions each will be allotted to the remaining COs, from which 2 questions must be answered

**Part B:** Part B consists of problem solving and short essay type questions related to the course. A total of six questions need to be answered, each carrying a weightage of 2, contributing to a cumulative weightage of 12 for the section.

For courses with 4 COs, there will be 2 bunches of 4 questions each, assigned to those COs not assessed in Part C, and students must answer 3 questions from each bunch.

For courses with 5 COs, there will be 3 bunches of 3 questions each, assigned to the COs not assessed in Part C, from which students must answer 2 questions from each bunch.

**Part C:** Part C will have four questions, grouped into two bunches, with each bunch containing two questions related to the same CO. Students must answer one question from each set. Each question will carry a weightage of 5, contributing to a total weightage of 10 for Part C.

Maximum weightage for End-Semester Assessment is 30. Therefore Maximum Weighted Grade Point (WGP) is 150.

**DIRECTIONS FOR QUESTION SETTERS:**

- 1) Questions shall be set to assess knowledge acquired, standard and application of knowledge in new situations, critical evaluation of knowledge and the ability to synthesize knowledge.
- 2) Due weightage shall be given to each module on content/teaching hours allotted to each module.
- 3) The question setter shall ensure that questions are set as per the course outcomes.
- 4) A question paper shall be a judicious mix of short answer type, short essay type/problem solving type and long essay type questions.
- 5) The questions shall be set in such a way that the answers can be awarded A<sup>+</sup>, A, B, C, D or E grade.
- 6) Different types of questions shall be given different weightage to quantify their range as shown below:

Sections	Type of Questions	Weightage	No. of COs	Number of questions to be answered (CO*- COs assessed in Part C)
Part A	Short Answer type	1	4	2 out of 3 from each CO bunch
			5	1 out of 2 from each CO* bunch 2 out of 3 from each CO bunch
Part B	Short essay/ problem solving type	2	4	3 out of 4 from each CO bunch
			5	2 out of 3 from each CO bunch
Part C	Long Essay type	5	4	1 out of 2 from each CO* bunch
			5	

**BLUEPRINT (For Courses with 4 COs or 72 hours)**

CO	Part A Weight 1 each (Total weights=8)	Part B Weight 2 each (Total weights =12)	Part C Weight 5 each (Total weights = 10)	Total Weights (30 out of 48)
	Part Ai (2 out of 3 questions of each CO)	Part Bi (3 out of 4 questions of a given CO)	Part Ci (1 out of 2 questions of a given CO)	
CO1	3	0/0/0/4/4/4	2/2/2/0/0/0	13/13/13/11/11/11
CO2	3	0/4/4/0/0/4	2/0/0/2/2/0	13/11/11/13/13/11
CO3	3	4/0/4/0/4/0	0/2/0/2/0/2	11/13/11/13/11/13
CO4	3	4/4/0/4/0/0	0/0/2/0/2/2	11/11/13/11/13/13

- Part A will contain section Ai (A1 to A4)
- Part B will contain Bi sections (B1-B2)
- Part C will contain Ci sections (C1 to C2)
- COs assessed in Part C (Essay) will not appear in Part B section.
- The blue print models are numbered as 4BP<sub>1</sub> to 4BP<sub>6</sub> denoted by each slash in the table



## **PRACTICAL, PROJECT AND VIVA VOCE EXAMINATIONS**

### **PRACTICAL EXAMINATION**

All practical examinations will be conducted at the end of respective semesters, The practical examinations are conducted immediately after the theory examinations. All practical examinations will be of four hours duration. One external examiner will be selected from the panel of examiners and one internal examiner will be selected by the department.

### **EVALUATION OF PRACTICAL EXAMINATIONS:**

The scheme of evaluation of the practical examination will be decided by the board of examiners. The different weights for assessment of different components is shown in the following table.

<b>COMPONENTS</b>	<b>WEIGHTAGE</b>
Written/Lab test	10
Lab involvement and Record	3
Viva	2
<b>TOTAL</b>	<b>15</b>

### **EVALUATION OF PROJECT**

The project is evaluated by one external and one internal examiner. The project is examined along with the oral presentation of the project by the candidate. The examiners should ascertain that the project and report are genuine. Innovative projects or the results/ findings of the project presented in national seminars may be given maximum advantage. The supervising guide or the faculty appointed by the head of the department may be allowed to be present at the time of project evaluation. This is only to facilitate proper evaluation of the project. The different weightage for assessment of different components is shown in the following table.

<b>COMPONENTS</b>	<b>WEIGHTAGE</b>
Relevance of the topic and analysis	2
Project content and presentation	10
Project viva	3
<b>TOTAL</b>	<b>15</b>

### **COMPREHENSIVE VIVA- VOCE EXAMINATION**

Viva-voce shall be conducted by one external examiner and one internal examiner of the board of examiners. The viva-voce shall cover questions from all courses in the programme.

The components of the ESA for comprehensive viva- voce and their weightage are as in the following table.

<b>COMPONENTS</b>	<b>WEIGHTAGE</b>
Fundamental concepts	9
Awareness of current topic/advanced topic	6
<b>TOTAL</b>	<b>15</b>

### **REAPPEARANCE / IMPROVEMENT**

- A student who fails to secure a minimum grade (Grade C) for a pass in a course will be permitted to write the examination along with the next batch.
- The candidate who wishes to improve the grade/grade point of the End-Semester Assessment of a course / courses she has passed can do the same by appearing in the End-Semester Assessment of the semester concerned along with the immediate junior batch. This facility is restricted to first and second semesters of the programme.
- There shall be supplementary examinations (no improvement) for third semester.

### **PROMOTION**

- A student who registers for a particular semester examination shall be promoted to the next semester.
- A student having 73% attendance and fails to register for examination of a particular semester will be allowed to register notionally and is promoted to the next semester, provided application for notional registration shall be submitted within 15 days of the commencement of the next semester.

### **COMPUTATION OF GPA/SGPA/CGPA**

**Grade Point Average (GPA):** ISA and ESA are separately graded using a six point scale and the combined grade point with weightage 1 for ISA and 3 for ESA shall be applied to calculate the grade point average (GPA) of each course.

**The Semester Grade Point Average (SGPA):** After the successful completion of a semester SGPA of a student in that semester is calculated using the formula given below. **Semester Grade**

**Point Average (SGPA)** =  $\frac{\sum(C_i \times GPA_i)}{\sum C_i}$  where  $C_i$  and  $GPA_i$  are the credit point and GPA

of each course respectively.

**Cumulative Grade Point Average (CGPA)** for the programme is calculated as follows:

**CGPA** =  $\frac{\sum(C_i \times SGPA_i)}{\sum C_i}$  where  $C_i$  and  $SGPA_i$  are the total credit point and SGPA of each

semester respectively.

**Note:** A separate minimum of C Grade for ESA (for both theory and practical) is required for pass for a course. For a pass in a programme, a separate minimum of Grade C is required for all the individual courses. If a candidate secures D Grade for any one of the courses offered in a Semester/Programme, only D grade will be awarded for that Semester/Programme until she improves this to C grade or above within the permitted period.

**Note on compliance with the UGC minimum standards for the conduct and award of postgraduate degrees:** Credit and semester system is followed in this program. The program has 4 semesters with eighteen weeks in each semester. In each semester there are 450 hours including both lecture and practical hours which is in compliance with the minimum 390 hours stipulated by the UGC.

**All Rules and regulations are subject to change as and when modified by MG University to which St Teresa's College (Autonomous) is affiliated.**

**SYLLABI FOR THE COURSES OF**  
**PGDM IN BUSINESS ANALYTICS**

## **SYLLABI FOR CORE COURSES**

## **SYLLABI FOR SEMESTER I**

**SEMESTER I**

**BA1C01TM25 – INTRODUCTION TO BUSINESS ANALYTICS**

**CREDITS: 4**

**TOTAL LECTURE HOURS : 90**

**COURSE OUTCOMES:**

**CO1:** Define the different types of analytical models such as descriptive, predictive, prescriptive, and diagnostic analytics. (Remember)

**CO2:** Differentiate between structured, semi-structured, and unstructured data, and utilize appropriate tools to process and analyze each type (Understand)

**CO3:** Interpret different types of analytics (Apply)

**CO4:** Assess the role of analytics in modern business environments and demonstrate its impact on strategic decision-making (Evaluate)

**CO5:** Interpret business data insights and recommend data-driven actions through real-world case studies and industry applications (Apply)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	1	1	3	1	2
<b>CO2</b>	2	1	3	1	2
<b>CO3</b>	1	1	3	1	2
<b>CO4</b>	1	1	2	1	3
<b>CO5</b>	1	1	2	1	3

**SYLLABUS CONTENT**

**Module 1 - Introduction to Business Analytics (CO1) Hours (18)**

Business analytics- Meaning, Importance, Responsibilities and Scope, Framework for Data Driven Decision Making, Key components of business analytics (Data, Models, Insights, Action), Application of Business Analytics-Data. Overview of different industries using analytics (Finance, Healthcare, Marketing, Supply Chain, etc.)

**Module 2 - Understanding Data Structures (CO2) Hours (18)**

Types of data - Structured, Semi Structured, Unstructured; Sources of business data (Databases, Spreadsheets, Web Data, social media, IoT); Data storage and processing fundamentals (Data

Warehousing, Data Lakes, Cloud Storage); Data quality, preprocessing, and handling missing data; Basics of Exploratory Data Analysis (EDA); Analytics Life cycle.

**Module 3: Machine Learning Approaches (CO3) Hours (18)**

Basic machine learning approaches - Supervised and Unsupervised learning and Reinforcement Learning, Descriptive Analytics: Types of data measures, summarizing historical data using statistics – measures of central tendencies - mean, median, mode, percentile, quartile, decile; measures of variance - range, IQR, variance, and standard deviation. Measures of shape - skewness & kurtosis; Data visualization – Histograms, Bar charts, pie chart, scatter plot, box plot.

**Module 4: Predictive Analytics – Supervised & Unsupervised Learning (CO4) Hours (18)**

Predictive Analytics: Forecasting future trends using statistical and machine learning models, Supervised Learning Models - Regression and classification algorithms – Simple Linear and Multiple Linear regression. Classification – Logistic Regression & Decision Trees.

Unsupervised Models – Clustering

**Module 5: Prescriptive and Diagnostic (CO5) Hours (18)**

Prescriptive Analytics: Linear Programming – Terminologies, model building, assumptions, recommending optimal actions based on predictions and decision science

Diagnostic Analytics: Understanding reasons behind past outcomes through correlation and causality, Root cause analysis, Anomaly Detection. Comparative analysis of the four types and real-world case studies

**LEARNING RESOURCES**

**Textbooks**

- Kumar, U. D. (2017). Business analytics: the Science of data - driven decision making. In Wiley eBooks. <https://repository.iimb.ac.in/handle/2074/12322>.
- Prasad, R. N., and Acharya, Seema. (2011). Fundamentals of Business Analytics, 1st Edition. New Delhi: Wiley India.

**References**

1. *Business Analytics: What it is & why it's important*. (2019, July 16). Business Insights Blog. <https://online.hbs.edu/blog/post/importance-of-business-analytics>
2. IBM. (2023, June 9.). *Business Analytics*. IBM/Think. <https://www.ibm.com/think/topics/business-analytics>



**MODEL QUESTION PAPER**  
**SEMESTER I – CORE COURSE**  
**BA1C01TM25 - INTRODUCTION TO BUSINESS ANALYTICS**

**Time: Three hours**

**Maximum Weight: 30**

**Part A**

**Part A1. Answer any 1 question from the bunch for CO1.**

**Each question carries 1 weight**

Q. No	Questions	CO	Level of Question
1.	Define predictive analytics and provide an example of its application in a real-world business scenario	CO1	U
2.	Explain the key differences between descriptive and prescriptive analytics	CO1	U

**Part A2. Answer any 1 question from the bunch for CO2.**

**Each question carries 1 weight**

Q. No	Questions	CO	Level of Question
3.	Differentiate between structured, semi-structured, and unstructured data with suitable examples	CO2	U
4.	What are the key sources of business data? Provide an example for each type.	CO2	R

**Part A3. Answer any 2 questions from the bunch for CO3.**

**Each question carries 1 weight**

Q. No	Questions	CO	Level of Question
5.	Compare and contrast predictive and diagnostic analytics with relevant business use cases.	CO3	A
6.	How does prescriptive analytics differ from predictive analytics? Provide an example.	CO3	A
7.	Explain how businesses use descriptive analytics to summarize past performance	CO3	A

**Part A4. Answer any 2 questions from the bunch for CO4.**

**Each question carries 1 weight**

Q. No	Questions	CO	Level of Question
8.	Why is business analytics important for strategic decision-making? Provide an example	CO4	A
9.	Evaluate the impact of analytics on business performance in a chosen industry.	CO4	E
10.	Explain how data-driven decision-making is improving business efficiency in modern organizations.	CO4	E

**Part A5. Answer any 2 questions from the bunch for CO5.**

**Each question carries 1 weight**

Q. No	Questions	CO	Level of Question
11.	Given a business dataset showing customer purchase patterns, how would you recommend actions using predictive analytics?	CO5	A
12.	How can anomaly detection help organizations in fraud detection? Provide an example.	CO5	A
13.	Explain how real-world case studies help in understanding the impact of business analytics.	CO5	A

**Part B**

**Part B1. Answer any 2 questions from the bunch for CO3.**

**Each question carries 2 weights**

Q. No	Questions	CO	Level of Question
14.	Explain the four types of analytics (Descriptive, Predictive, Prescriptive, and Diagnostic) and their interconnections using a business case example.	CO3	A

15.	Apply predictive analytics to a retail business scenario and explain how it can help improve sales forecasting.	CO3	A
16.	Compare & contrast the role of diagnostic and prescriptive analytics in healthcare.	CO3	A

**Part B2. Answer any 2 questions from the bunch for CO4.**

**Each question carries 2 weights**

Q. No	Questions	CO	Level of Question
17.	Evaluate the role of machine learning models in predictive analytics. Provide examples from at least two industries.	CO4	E
18.	How does big data analytics help businesses make better strategic decisions? Discuss with a case study example.	CO4	E
19.	Discuss the challenges organizations face when implementing data-driven decision-making and propose solutions.	CO4	E

**Part B3. Answer any 2 questions from the bunch for CO5.**

**Each question carries 2 weights**

Q. No	Questions	CO	Level of Question
20.	Given a dataset of customer churn in a telecom company, suggest a predictive analytics approach and how it can help in customer retention strategies.	CO5	A
21.	Interpret the role of linear regression in sales forecasting and demonstrate its application in a business scenario.	CO5	A
22.	How can businesses utilize clustering techniques in customer segmentation? Provide an example.	CO5	A

**Part C**

**Part C1. Answer any 1 question from the bunch for CO1.**

**Each question carries 5 weights**

Q. No	Questions	CO	Level of Question
23.	Explain in detail the four types of business analytics models (descriptive, predictive, prescriptive, and diagnostic) and illustrate their application in different business sectors.	CO1	U
24.	Discuss the key components of business analytics and how they contribute to data-driven decision-making	CO1	U

**Part C2. Answer any 1 question from the bunch for CO5.**

**Each question carries 5 weights**

Q. No	Questions	CO	Level of Question
25.	Explain the principles of effective data visualization. Using a business context (e.g., sales, operations), demonstrate how visualizations can help managers make better decisions.	CO5	U
26.	Discuss how Tableau or Power BI can be used to monitor KPIs in real-time. Explain how interactivity and drill-down options support deeper insights	CO5	U

**SEMESTER I**

**BA1C02TM25 - STATISTICS FOR BUSINESS**

**CREDITS: 4**

**TOTAL LECTURE HOURS: 90**

**COURSE OUTCOMES**

**CO1:** Discuss descriptive statistics techniques to effectively summarize and interpret data distributions. (Understand)

**CO2:** Apply Probability theory to business problems to analyze uncertainty in real-world business scenarios (Apply)

**CO3:** Select and implement appropriate sampling techniques to analyze data effectively in various business scenarios (Analyse)

**CO4:** Develop hypothesis tests to analyze data and draw meaningful business insights (Apply)

**CO5:** Illustrate different statistical tests to derive meaningful insights and support business decisions. (Apply)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	1	2	1	2
<b>CO2</b>	3	1	2	1	2
<b>CO3</b>	3	1	2	1	2
<b>CO4</b>	3	1	2	1	2
<b>CO5</b>	3	1	2	1	2

**SYLLABUS CONTENT**

**Module 1 – Fundamentals of Statistics (CO1)**

**Hours (18)**

Introduction to Business Statistics, Types of Data - Nominal, Ordinal, Interval, and Ratio, Descriptive Statistics - Measures of Central Tendency: Mean, Median, and Mode, Measures of Dispersion: Range, Variance, Standard Deviation, and Coefficient of Variation, Skewness, Kurtosis, and Shape of Data Distributions

**Module 2 – Probability Distribution (CO2)**

**Hours (18)**

Probability Theory, fundamental concepts in probability, Association Rule learning, Bayes Theorem, random variables - discrete & continuous, distribution (Binomial, Poisson, Normal Geometric, Exponential, Chi-Square, t and f)

**Module 3 - Sampling and Estimation (CO3)**

**Hours (18)**

Population parameters and sample statistic, sampling - frame, size, methods (Probability & non-Probability), Central Limit Theorem, Concept of Standard Error, Confidence Intervals, Data Collection Methods, and Sampling Techniques – Probability and non-probability sampling methods.

**Module 4 - Hypothesis testing and statistical Inferences (CO4)**

**Hours (18)**

Defining the null and alternative hypothesis, Confidence Intervals, significance values, type I and Type 2 error, Power of hypothesis test, hypothesis testing for population proportion, comparing two population, Effect Size - Cohen's D.

**Module 5 - Parametric and non-parametric tests (CO5)**

**Hours (18)**

Parametric Tests - One Sample T-test, Paired Sample T-test, Analysis of Variance (ANOVA). Correlation & Regressions. Non-parametric Tests - Introduction, Runs test, Mann-Whitney test U test, Wilcoxon matched-pairs signed rank test, Kruskal-Wallis test, Friedman test.

**LEARNING RESOURCES**

**Textbooks**

- Naval Bajpai. (2014). Business Statistics. Dorling Kindersley (India), Pearson
- Kumar, U. D. (2017). Business analytics: the Science of data - driven decision making. In Wiley eBooks. <https://repository.iimb.ac.in/handle/2074/12322>.
- J K Sharma. (2014). Fundamentals of Business Statistics. Noida: Vikas Publications.
- Waller, Derek. (2008). Statistics for Business. London: BH Publications.
- Lee, Cheng. et al. (2013). Statistics for Business and Financial Economics. New York: Heidelberg Dordrecht.

**References**

1. GeeksforGeeks. (2024, April 22). *Business Statistics Importance, application and Types*. GeeksforGeeks. <https://www.geeksforgeeks.org/business-statistics-importance-application-and-types/>
2. Scribbr. "The Beginner's Guide to Statistical Analysis" Accessed April, 21st, 2025. <https://www.scribbr.com/category/statistics/>



**MODEL QUESTION PAPER**  
**SEMESTER I – CORE COURSE**  
**BA1C02TM25 – STATISTICS FOR BUSINESS**

**Time: Three hours**

**Maximum Weight: 30**

**Part A**

**Part A1. Answer any 1 question from the bunch for CO1.**

**Each question carries 1 weight**

Q. No	Questions	CO	Level of Question
1.	Explain the different types of data	CO1	R
2.	Differentiate between skewness and kurtosis	CO1	U

**Part A2. Answer any 1 question from the bunch for CO2.**

**Each question carries 1 weight**

Q. No	Questions	CO	Level of Question
3.	Define probability and mention its types.	CO2	U
4.	State Bayes' Theorem and its application in business analytics.	CO2	R

**Part A3. Answer any 2 questions from the bunch for CO3.**

**Each question carries 1 weight**

Q. No	Questions	CO	Level of Question
5.	What is a sampling frame?	CO3	U
6.	Define the concept of standard error	CO3	R
7.	What is the difference between population parameter and sample statistic?	CO3	U

**Part A4. Answer any 2 questions from the bunch for CO4.**

**Each question carries 1 weight**

Q. No	Questions	CO	Level of Question
8.	What is the null hypothesis in hypothesis testing?	CO4	U
9.	Define effect size & its importance in hypothesis testing	CO4	A
10.	Differentiate between Type I and Type II errors	CO4	U

**Part A5. Answer any 2 questions from the bunch for CO5.**

**Each question carries 1 weight**

Q. No	Questions	CO	Level of Question
11.	What are the different types of T Tests	CO5	R
12.	Name some of the parametric tests	CO5	U
13.	Name some of the non-parametric tests	CO5	U

**Part B**

**Part B1. Answer any 2 questions from the bunch for CO2.**

**Each question carries 2 weights**

Q. No	Questions	CO	Level of Question
14.	Explain Bayes' Theorem with a real-life example. How is it useful in updating probabilities based on new evidence?	CO2	U
15.	Differentiate between discrete & continuous random variables. Provide one example for each and mention their respective probability distributions.	CO2	A
16.	State the key characteristics of the Normal distribution. How is it used in business decision-making and statistical inference?	CO2	An

**Part B2. Answer any 2 questions from the bunch for CO4.**

**Each question carries 2 weights**

Q. No	Questions	CO	Level of Question
17.	Define Type I and Type II errors in hypothesis testing. Provide an example of each in a business decision-making context.	CO4	U
18.	Explain the concept of Confidence Intervals. If a 95% confidence interval for the mean revenue of a company is (\$50,000, \$60,000), what does this interval indicate	CO4	R
19.	What is Cohen's D, and how is it used to measure effect size? Explain with an example.	CO4	A

**Part B3. Answer any 2 questions from the bunch for CO5.**

**Each question carries 2 weights**

Q. No	Questions	CO	Level of Question
20.	Differentiate between the One-Sample T-test and the Paired Sample T-test with suitable examples.	CO5	A
21.	Explain the Kruskal-Wallis test. How does it differ from ANOVA?	CO5	U
22.	What is the Wilcoxon matched-pairs signed-rank test, and when is it used? Provide a practical example.	CO5	A

**Part C**

**Part C1. Answer any 1 question from the bunch for CO4.**

**Each question carries 5 weights**

Q. No	Questions	CO	Level of Question
23.	You are analysing customer satisfaction scores before and after implementing a new service strategy. a) Formulate the null and alternative hypotheses for testing the effectiveness of the strategy.	CO4	U

	<p>b) Explain the concepts of Type I and Type II errors, and power of the test in this context.</p> <p>c) Illustrate how confidence intervals and significance values influence the decision-making process.</p>		
24.	<p>A market researcher wants to compare the proportion of online shoppers who prefer sustainable packaging between two regions.</p> <p>a) Formulate the hypothesis for comparing two population proportions.</p> <p>b) Describe the steps of hypothesis testing in this scenario.</p> <p>c) Explain the role of effect size (Cohen's d) in interpreting practical significance, even if statistical significance is not achieved.</p> <p>d) Discuss how the sample size affects the reliability of the hypothesis test.</p>	CO4	R

**Part C2. Answer any 1 question from the bunch for CO3.**

**Each question carries 5 weights**

Q. No	Questions	CO	Level of Question
25.	<p>A company is launching a new product and wants to survey potential customers.</p> <p>a) Explain how you would define the population and identify an appropriate sampling frame.</p> <p>b) Compare probability and non-probability sampling methods, and justify which method would be most appropriate for this survey.</p> <p>c) Describe how sample size affects the accuracy of the results, and explain the role of the standard error.</p>	CO3	U
26.	<p>You are conducting a study to estimate the average time users spend on a mobile app daily.</p> <p>a) Discuss how the Central Limit Theorem applies to your sampling strategy.</p> <p>b) Explain the steps to calculate a confidence interval for the population mean.</p> <p>c) Differentiate between population parameters and sample statistics, and explain how data collection methods can influence the validity of your inferences.</p>	CO3	R

**SEMESTER I**

**BA1C03TM25 - MANAGEMENT CONCEPTS AND PRACTICES**

**CREDITS: 4**

**TOTAL LECTURE HOURS: 90**

**COURSE OUTCOMES**

**CO1:** Summarize on the evolution of management concepts and practices (Understand)

**CO2:** Analyse the importance and impact of various functions within organization (Analyse)

**CO3:** Interpret and evaluate the reasoning behind strategic choices and organizational decisions (Apply)

**CO4:** Illustrate the necessity of operational practices globally and emergent market trends (Understand)

**CO5:** Relate leadership and motivational theories into practical management scenarios (Apply)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	1	1	2	1	3
<b>CO2</b>	1	1	2	1	3
<b>CO3</b>	1	1	2	1	3
<b>CO4</b>	1	1	2	1	3
<b>CO5</b>	1	1	2	1	3

**SYLLABUS CONTENT**

**Module 1 - Introduction to Management (CO1)**

**Hours (18)**

Management - Meaning, Nature, Functions; Vision, Mission, Goals and Objectives; Management as an Art, Science and Profession; Evolution of Management, Management Thoughts - Early, Modern and Post modern; Contributions of F.W. Taylor, Henry Fayol, Hawthorne Studies, Behavioural School of Management; Levels of Management; Managerial Skills and Roles

**Module 2 - Planning, Organizing & Staffing (CO2)**

**Hours (18)**

Meaning, Nature, Importance and Levels of Planning; Premises for Effective Planning, Components and Types of Plans, Planning and Decision Making; Planning Process; Organising - Nature and Purpose; Organizational Structure; Staffing - Meaning, Principles and Functions of Staffing, Case Study

**Module 3 - Management Strategy through Forecasting (CO3)**

**Hours (18)**

Meaning, Importance, Functions : Staffing , Directing , Controlling, Forecasting and Decision Making - Meaning, Nature, Importance and Process; Strategy - Meaning, Importance, Environmental Analysis & Diagnosis – SWOT Analysis, Porter's 5-Forces Model, Relationship between Decision Making

**Module 4 - Emerging Trends (CO4)**

**Hours (18)**

Management in Globalized Era, Management By Objectives (MBO), Business Ethics, Organizational Social Responsibility; Sustainable Business Practices; Case Study

**Module 5 - Leadership & Motivation (CO5)**

**Hours (18)**

Meaning & Importance -Leadership: Meaning & Styles Motivation: importance & Theories (Maslow, Herzberg, McGregor), Delegation, elements of delegation, Relationship between authority and responsibility, principles of delegation, centralization and decentralization.

**LEARNING RESOURCES**

**Text books**

- K. Aswathappa, —Essential of Business Administrationl, Himalaya Publishing House
- Stephen P. Robbins and Mary Coulter, —Managementl, Prentice Hall of India
- Tripathy PC and Reddy PN, —Principles of Management", Tata McGraw-Hill
- J.A. Pearce & R.B. Robinson : Strategic Management formulation implementation and control, TMH
- Arthur A. Thompson Jr. and A.J. Strickland: Strategic Management –Concepts and Cases, McGraw-Hill Companies

**References**

1. <https://hbr.org/2007/09/demystifying-strategy-the-what>
2. <https://hbr.org/sponsored/2019/12/how-companies-are-using-intelligent-automation-to-bemore-innovative>



**MODEL QUESTION PAPER**  
**SEMESTER I - CORE COURSE**

**BA1C03TM25 - MANAGEMENT CONCEPTS AND PRACTICES**

**Time: Three hours**

**Maximum Weight: 30**

**Part A**

**Part A1. Answer any 1 question from the bunch for CO3.**

**Each question carries 1 weight**

Q. No	Questions	CO	Level of Question
1.	Explain SWOT	CO3	U
2.	Define strategy.	CO3	R

**Part A2. Answer any 1 questions from the bunch for CO4.**

**Each question carries 1 weight**

Q. No	Questions	CO	Level of Question
3.	Explain MBO	CO4	U
4.	State any two sustainable business practices	CO4	R

**Part A3. Answer any 2 questions from the bunch for CO1.**

**Each question carries 1 weight**

Q. No	Questions	CO	Level of Question
5.	Define Management.	CO1	R
6.	State vision and mission	CO1	U
7.	Discuss the levels of management	CO1	U

**Part A4. Answer any 2 questions from the bunch for CO2.**

**Each question carries 1 weight**

Q. No	Questions	CO	Level of Question
8.	Explain various levels of planning	CO2	U
9.	Define staffing.	CO2	R
10.	Explain organizational structure	CO2	U

**Part A5. Answer any 2 questions from the bunch for CO5.**

**Each question carries 1 weight**

Q. No	Questions	CO	Level of Question
11.	What do you mean by delegation	CO5	R
12.	Briefly explain the elements of delegation.	CO5	U
13.	Explain centralization.	CO5	U

**Part B**

**Part B1. Answer any 2 questions from the bunch for CO1.**

**Each question carries 2 weights**

Q. No	Questions	CO	Level of Question
14.	'Management is the systematised body of knowledge that explains certain general truths.' Explain	CO1	U
15.	The Hawthorne Studies were originally initiated to examine the relationship between lighting levels and worker productivity. Explain	CO1	U
16.	All managers must acquire these skills in varying proportions, although the importance of each category of skill changes at different management levels. Explain.	CO1	U

**Part B2. Answer any 2 questions from the bunch for CO2.**

**Each question carries 2 weights**

Q. No	Questions	CO	Level of Question
17.	Discuss in depth the types of Planning	CO2	U
18.	Explain the prerequisites of effective planning in management with examples of your choice.	CO2	An
19.	Staffing is not recruitment. It involves performance management, retention, and even training daily. Relate with an example.	CO2	A

**Part B3. Answer any 2 questions from the bunch for CO5.**

**Each question carries 2 weights**

Q. No	Questions	CO	Level of Question
20.	Explain Maslow's need theory.	CO5	A
21.	Briefly narrate the concept 'decentralization'.	CO5	U
22.	Describe the concept 'motivation'.	CO5	A

**Part C**

**Part C1. Answer any 1 question from the bunch for CO3.**

**Each question carries 5 weights**

Q. No	Questions	CO	Level of Question
23.	Using Porter's Five Forces combined with a SWOT analysis helps understand the company's position in the marketplace. Summarize the understanding.	CO3	U
24.	Forecasting models are used to predict future aspects of business operation. Explain.	CO3	A

**Part C2. Answer any 1 question from the bunch for CO4.**

**Each question carries 5 weights**

Q. No	Questions	CO	Level of Question
25.	Sustainability is an essential part of social and environmental responsibility in business today and it is a necessary step toward preserving our planet for future generations. Discuss with an example.	CO4	U
26.	Globalization has catalysed transformative shifts in how organizations navigate the complexities of the global marketplace. Explain.	CO4	U

**SEMESTER I**

**BA1C04TM25 -ACCOUNTING FOR MANAGERS**

**CREDITS: 4**

**TOTAL LECTURE HOURS: 90**

**COURSE OUTCOMES**

**CO1:** Prepare financial statement of an organizational concern. (Apply)

**CO2:** Analyse and interpret the financial statements using management accounting techniques. (Apply)

**CO3:** Prepare budgets for an organizational concern. (Apply)

**CO4:** Differentiate manual accounting and computerised accounting. (Understand)

**CO5:** Explain the significance of green accounting. (Understand)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	2	1	3	1	2
<b>CO2</b>	3	1	3	1	3
<b>CO3</b>	3	1	3	1	3
<b>CO4</b>	2	1	2	1	3
<b>CO5</b>	2	1	3	1	3

**SYLLABUS CONTENT**

**Module 1: Financial Accounting (CO1)**

**Hours (18)**

Accounting, objective of accounting, users of accounting, book-keeping system, accounting concepts and conventions, financial accounting, journal, ledger, trial balance, adjusting entries, final accounts.

**Module 2: Financial Statement Analysis and Interpretation (CO2)**

**Hours (18)**

Financial statement analysis and interpretation, tools and techniques of analysis, Ratio analysis- solvency ratio, liquidity ratio, profitability ratios, Fund flow analysis. Cash flow analysis.

**Module 3: Budgetary Control and Marginal Costing (CO3)**

**Hours (18)**

Concepts of budget and its advantages, classification of budget, flexible budget and cash budget, zero based budgeting, responsibility accounting, performance budgeting. Marginal Costing and

Profit Planning: Marginal costing, direct costing, contribution, profit planning, Cost-volume-profit Analysis (CVP analysis), P/V ratio, Margin of safety, Break-even Analysis, advantages and limitations of marginal costing, application of marginal costing technique.

**Module 4: Computerised accounting (CO4)**

**Hours (18)**

Computerised accounting, merits and demerits, difference between manual and computerised accounting, accounting software, Tally.

**Module 5: Developments in Accounting (CO5)**

**Hours (18)**

Block chain Technology in Accounting, Artificial Intelligence in Accounting (overview only). Green Accounting Concepts - Scope and Significance - developments in a globalised era. Sustainability reporting (Theory only) Forensic Accounting – Lean Accounting.

**LEARNING RESOURCES:**

**Textbook**

- Khan, M. Y. and P. K. Jain (2013). *Management Accounting - Text, Problems and Cases*. New Delhi: McGraw Hill Education.
- Advanced accountancy, Arulanandam & Raman, Himalaya Publishing House
- Fundamentals of Financial accounting, Nassem Ahmed, Ane books Pvt, Limited

**References:**

1. Maheshwari, S. K., S. N. Maheshwari and Sharad K. Maheshwari. *Accounting for Management*. New Delhi: Vikas Publishing House.
2. Gupta, Ambarish. *Financial Accounting for Management: An Analytical Perspective*. New Delhi: Pearson Education.
3. Banerjee, Ashok. *Financial Accounting: A Managerial Emphasis*. New Delhi: Excel Books.
4. Alexander, David and Anne Britton. *Financial Reporting*. Boston: International Thomson Business Press.

**BLUE PRINT OF QUESTION PAPER FOR CORE COURSE –  
ACCOUNTING FOR MANAGERS**

CO	Part A Weight 1 each (Total weights=8)		Part B Weight 2 each (Total weights =12)	Part C Weight 5 each (Total weights = 10)	Total Weights (30 out of 51)
	Part Ai * [1 out of 2 questions of each CO*]	Part Ai [2 out of 3 questions of each CO]	Part Bi [2 out of 3 questions of a given CO]	Part Ci [1 out of 2 questions of a given CO*]	
CO1	2/2/2/2/0/0/0/0/0/0/0 /0	0/0/0/0/3/3/3/3/3/ 3/3	0/0/0/0/3/3/3/3/3/3/ /3	2/2/2/2/0/0/0/0/0/0/0 /0	12/12/12/12/9/9/9/9/9/ 9
CO2	2/0/0/0/2/2/2/2/0/0/0 /0	0/3/3/3/0/0/0/0/3/ 3/3	0/3/3/3/0/0/0/0/3/3/ /3	2/0/0/0/2/2/2/2/0/0/0 /0	12/9/9/9/12/12/12/9/9/ 9
CO3	0/2/0/0/2/0/0/2/2/2/2 /0	3/0/3/3/0/3/3/0/0/ 0/3	3/0/3/3/0/3/3/0/0/0/ /3	0/2/0/0/2/0/0/2/2/2/2 /0	9/12/9/9/12/9/9/12/12/ 9
CO4	0/0/2/0/0/2/0/2/0/2/0 /2	3/3/0/3/3/0/3/0/0/ 3/0	3/3/0/3/3/0/3/0/3/0/3/ /0	0/0/2/0/0/2/0/2/0/2/0 /2	9/9/12/9/9/12/9/12/9/1 2
CO5	0/0/0/2/0/0/2/0/2/0/2 /2	3/3/3/0/3/3/0/3/0/3/ 0/0	3/3/3/0/3/3/0/3/0/3/0/ /0	0/0/0/2/0/0/2/0/2/0/2 /2	9/9/9/12/9/9/12/9/12/1 2

**MODEL QUESTION PAPER**  
**SEMESTER I – CORE COURSE**  
**BA1C04TM25 – ACCOUNTING FOR MANAGERS**

**Time: Three hours**

**Maximum Weight: 30**

**Part A**

**Part A1. Answer any 1 question from the bunch for CO1.**

**Each question carries 1 weight**

Q. No	Questions	CO	Level of Question
1.	State the accounting treatment for outstanding rent.	CO1	U
2.	Identify the users of accounting information.	CO1	U

*(1x 1= 1 weight)*

**Part A2. Answer any 1 question from the bunch for CO2.**

**Each question carries 1 weight**

Q. No	Questions	CO	Level of Question
3.	Mention any 2 uses of fund flow statement.	CO2	U
4.	The following information of a company is given: <ul style="list-style-type: none"><li>• Current Ratio=2.5:1</li><li>• Acid test ratio= 1.5:1</li><li>• Current liability= Rs.50000</li></ul> Find out: current asset, liquid asset.	CO2	A

**Part A3. Answer any 2 questions from the bunch for CO3.**

**Each question carries 1 weight**

Q. No	Questions	CO	Level of Question
5.	Determine the amount of fixed expenses from the following particulars: <ul style="list-style-type: none"><li>• Sales=240000; Direct materials=80000</li><li>• Direct labour=50000; Variable OH=20000</li><li>• Profit=50000.</li></ul>	CO3	A
6.	Point any two demerits of ZBB.	CO3	U
7.	Explain Margin of safety.	CO3	U

**Part A4. Answer any 2 questions from the bunch for CO4.**

**Each question carries 1 weight**

Q. No	Questions	CO	Level of Question
8.	Explain Computerized accounting system.	CO4	U
9.	Mention any two merits of Computerized accounting system.	CO4	U
10.	List out any four accounting softwares in the market.	CO4	U

**Part A5. Answer any 2 questions from the bunch for CO5.**

**Each question carries 1 weight**

Q. No	Questions	CO	Level of Question
11.	Explain Forensic accounting.	CO5	U
12.	Identify any one example of green accounting.	CO5	U
13.	Explain lean accounting.	CO5	U

*(2x 1 = 2 weights)*

**Part B**

**Part B1. Answer any 2 questions from the bunch for CO3.**

**Each question carries 2 weights**

Q. No	Questions	CO	Level of Question
14.	With the following data for a 60 per cent activity prepare a flexible budget at 80 and 100 per cent activity. <ul style="list-style-type: none"><li>• Production at 60 per cent activity- 600 units</li><li>• Materials Rs.100 per unit</li><li>• Labour Rs.40 per unit</li><li>• Expenses Rs.10 per unit</li><li>• Factory Expenses Rs.40000 (40 per cent fixed)</li><li>• Administration Expenses Rs.30000 (60 per cent fixed)</li></ul>	CO3	A
15.	From the following information relating to Quick standard Ltd, you are required to find out:	CO3	A

	1. P/V ratio 2. Break even point 3. Margin of safety 4. Volume of sales to earn a profit of Rs.6000. Total Fixed Cost Rs.4500, Total Variable Cost Rs.4500, Total Sales Rs.15000.																											
16.	From the following information prepare a cash budget for the months of June and July. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Month</th> <th style="width: 15%;">Credit sales</th> <th style="width: 15%;">Credit purchase</th> <th style="width: 15%;">Manufacturing OH</th> <th style="width: 15%;">Selling OH</th> </tr> </thead> <tbody> <tr> <td>April</td> <td>80000</td> <td>60000</td> <td>2000</td> <td>3000</td> </tr> <tr> <td>May</td> <td>84000</td> <td>64000</td> <td>2400</td> <td>2800</td> </tr> <tr> <td>June</td> <td>90000</td> <td>66000</td> <td>2600</td> <td>2800</td> </tr> <tr> <td>July</td> <td>84000</td> <td>64000</td> <td>2000</td> <td>2600</td> </tr> </tbody> </table> <p>Additional information:</p> <ul style="list-style-type: none"> <li>• Advance tax of Rs.4000 payable in June and in December 1994</li> <li>• Credit period allowed to debtors is two months</li> <li>• Credit period allowed by the vendors or suppliers is one month</li> <li>• Delay in the payment of other expenses one month</li> </ul> Opening balance of cash on 1st June is estimated as Rs.20000	Month	Credit sales	Credit purchase	Manufacturing OH	Selling OH	April	80000	60000	2000	3000	May	84000	64000	2400	2800	June	90000	66000	2600	2800	July	84000	64000	2000	2600	CO3	A
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July	84000	64000	2000	2600																								

*(2x 2= 4 weights)*

**Part B2. Answer any 2 questions from the bunch for CO4.**

**Each question carries 2 weights**

Q. No	Questions	CO	Level of Question
17.	Identify any one accounting software and explain it briefly.	CO4	U
18.	Discuss the merits and demerits of computerised accounting.	CO4	U
19.	Differentiate computerised accounting and manual accounting.	CO4	U

*(2x 2= 4 weights)*

**Part B3. Answer any 2 questions from the bunch for CO5.**

**Each question carries 2 weights**

Q. No	Questions	CO	Level of Question
20.	Enumerate the significance of green accounting in the modern era.	CO5	U
21.	Discuss Block chain Technology in Accounting.	CO5	U
22.	Write a short note on Artificial Intelligence in Accounting	CO5	U

(2x 2= 4 weights)

**Part C**

**Part C1. Answer any 1 question from the bunch for CO1.**

**Each question carries 5 weights**

Q. No	Questions	CO	Level of Question																																																																								
23.	<p>From the following trial balance, prepare trading and profit and loss account for the year ending 31st Dec 2001 and a balance sheet as on that date.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">Particulars</th> <th style="width: 20%;">Debit</th> <th style="width: 20%;">Credits</th> </tr> </thead> <tbody> <tr> <td>Capital</td> <td></td> <td style="text-align: right;">25000</td> </tr> <tr> <td>Sundry Creditors</td> <td></td> <td style="text-align: right;">7000</td> </tr> <tr> <td>Interest</td> <td></td> <td style="text-align: right;">600</td> </tr> <tr> <td>Sales</td> <td></td> <td style="text-align: right;">160000</td> </tr> <tr> <td>Bills payable</td> <td></td> <td style="text-align: right;">4000</td> </tr> <tr> <td>Rent received</td> <td></td> <td style="text-align: right;">1000</td> </tr> <tr> <td>Sundry debtors</td> <td style="text-align: right;">1500</td> <td></td> </tr> <tr> <td>Opening stock</td> <td style="text-align: right;">5000</td> <td></td> </tr> <tr> <td>Land and building</td> <td style="text-align: right;">10000</td> <td></td> </tr> <tr> <td>Cash in hand</td> <td style="text-align: right;">1600</td> <td></td> </tr> <tr> <td>Cash at bank</td> <td style="text-align: right;">4000</td> <td></td> </tr> <tr> <td>Wages</td> <td style="text-align: right;">3000</td> <td></td> </tr> <tr> <td>Bills receivable</td> <td style="text-align: right;">2000</td> <td></td> </tr> <tr> <td>Interest</td> <td style="text-align: right;">200</td> <td></td> </tr> <tr> <td>Warehousing lighting</td> <td style="text-align: right;">500</td> <td></td> </tr> <tr> <td>Repairs</td> <td style="text-align: right;">300</td> <td></td> </tr> <tr> <td>Furniture and fittings</td> <td style="text-align: right;">3500</td> <td></td> </tr> <tr> <td>Rent, rate and taxes</td> <td style="text-align: right;">800</td> <td></td> </tr> <tr> <td>Salary</td> <td style="text-align: right;">2000</td> <td></td> </tr> <tr> <td>Purchases</td> <td style="text-align: right;">10000</td> <td></td> </tr> <tr> <td>Office expenses</td> <td style="text-align: right;">2500</td> <td></td> </tr> <tr> <td>Machinery</td> <td style="text-align: right;">6700</td> <td></td> </tr> <tr> <td></td> <td style="text-align: right;">53600</td> <td style="text-align: right;">53600</td> </tr> </tbody> </table>	Particulars	Debit	Credits	Capital		25000	Sundry Creditors		7000	Interest		600	Sales		160000	Bills payable		4000	Rent received		1000	Sundry debtors	1500		Opening stock	5000		Land and building	10000		Cash in hand	1600		Cash at bank	4000		Wages	3000		Bills receivable	2000		Interest	200		Warehousing lighting	500		Repairs	300		Furniture and fittings	3500		Rent, rate and taxes	800		Salary	2000		Purchases	10000		Office expenses	2500		Machinery	6700			53600	53600	CO1	A
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	Adjustments: <ul style="list-style-type: none"> <li>• Warehousing lighting paid in advance RS.100</li> <li>• Interest accrued on 31st dec 2001 Rs.300</li> <li>• Commission receivable Rs.400</li> <li>• Rent receivable Rs.100</li> <li>• Salary outstanding Rs.1000</li> <li>• Wages unpaid Rs.500</li> </ul> Closing stock Rs.10,000		
24.	With the help of examples explain Accounting concepts and conventions.	CO1	U

(1x 5= 5 weights)

**Part C2. Answer any 1 question from the bunch for CO1.**

**Each question carries 5 weights**

Q. No	Questions	CO	Level of Question																																																															
25.	<p><b>Prepare Comparative statement from the following data:</b></p> <p><b>Income statement</b></p> <table border="1"> <thead> <tr> <th></th> <th>2010</th> <th>2011</th> </tr> </thead> <tbody> <tr> <td>Net sales</td> <td>600</td> <td>750</td> </tr> <tr> <td>Cost of goods sold</td> <td>400</td> <td>600</td> </tr> <tr> <td>Administrative expenses</td> <td>20</td> <td>20</td> </tr> <tr> <td>Selling expenses</td> <td>10</td> <td>10</td> </tr> <tr> <td>Net profit</td> <td>170</td> <td>120</td> </tr> </tbody> </table> <p><b>Balance Sheet</b></p> <table border="1"> <thead> <tr> <th></th> <th>2010</th> <th>2011</th> </tr> </thead> <tbody> <tr> <td>Equity capital</td> <td>400</td> <td>400</td> </tr> <tr> <td>6% Preference shares</td> <td>300</td> <td>300</td> </tr> <tr> <td>Reserves</td> <td>200</td> <td>245</td> </tr> <tr> <td>6% Debenturs</td> <td>100</td> <td>150</td> </tr> <tr> <td>Bills payable</td> <td>50</td> <td>75</td> </tr> <tr> <td>Creditors</td> <td>150</td> <td>200</td> </tr> <tr> <td>Tax payable</td> <td>100</td> <td>150</td> </tr> <tr> <td></td> <td>1300</td> <td>1520</td> </tr> <tr> <td>Land</td> <td>100</td> <td>100</td> </tr> <tr> <td>Building</td> <td>300</td> <td>270</td> </tr> <tr> <td>Plant</td> <td>300</td> <td>270</td> </tr> <tr> <td>Furniture</td> <td>100</td> <td>140</td> </tr> <tr> <td>Stock</td> <td>200</td> <td>300</td> </tr> <tr> <td>Cash</td> <td>300</td> <td>440</td> </tr> </tbody> </table>		2010	2011	Net sales	600	750	Cost of goods sold	400	600	Administrative expenses	20	20	Selling expenses	10	10	Net profit	170	120		2010	2011	Equity capital	400	400	6% Preference shares	300	300	Reserves	200	245	6% Debenturs	100	150	Bills payable	50	75	Creditors	150	200	Tax payable	100	150		1300	1520	Land	100	100	Building	300	270	Plant	300	270	Furniture	100	140	Stock	200	300	Cash	300	440	CO2	A
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26.	<p><b>Calculate the trend percentages from the following figures of X Ltd. Taking 2005 as the base and interpret them:</b></p> <table border="1"> <thead> <tr> <th>Year</th> <th>Sales</th> <th>Stock</th> <th>Profit before tax</th> </tr> </thead> <tbody> <tr> <td>2005</td> <td>1881</td> <td>709</td> <td>321</td> </tr> <tr> <td>2006</td> <td>2340</td> <td>781</td> <td>435</td> </tr> <tr> <td>2007</td> <td>2655</td> <td>816</td> <td>458</td> </tr> <tr> <td>2008</td> <td>3021</td> <td>944</td> <td>527</td> </tr> <tr> <td>2009</td> <td>3768</td> <td>1154</td> <td>672</td> </tr> </tbody> </table>				Year	Sales	Stock	Profit before tax	2005	1881	709	321	2006	2340	781	435	2007	2655	816	458	2008	3021	944	527	2009	3768	1154	672	CO2	A
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*(1x 5= 5 weights)*

**SEMESTER I**

**BA1C01PM25 - SPREADSHEET MODELLING AND DECISION ANALYSIS**

**CREDITS: 3**

**TOTAL PRACTICAL HOURS: 90**

**COURSE OUTCOMES**

**CO1:** Administer basic data manipulations using Excel (Apply)

**CO2:** Illustrate Mathematical – Trigonometry – Statistical Functions using referencing (Analyse)

**CO3:** Apply advanced excel functions like LOOKUP (Apply)

**CO4:** Analyse data using Pivot Table – Filters and What If Analysis (Analyse)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	2	1	2	3	1
<b>CO2</b>	2	1	2	3	1
<b>CO3</b>	2	1	2	3	1
<b>CO4</b>	2	1	2	3	1

**SYLLABUS CONTENT**

**Module 1 - Spreadsheet structure (CO1) Hours (18)**

Boolean values: Boolean or logical values are either TRUE or FALSE. Dates and times: Stores dates and times that can be used in calculations. Values: Numbers. Whole numbers (1, 2, 500) and decimals (1.5, 80.45 etc.) Text: Descriptive pieces of information such as names, addresses and post codes. Formula: Allows to perform addition, subtraction, multiplications, or divisions

**Module 2 - Spreadsheet features (CO2) Hours (18)**

Conditional formatting, Importing data, Headers and footers, Absolute and relative cell references, Charts and graphs - Line graph, Pie chart, Bar chart, Scatter graph.

**Module 3 - Data Analysis using Spreadsheets (CO3) Hours (18)**

Analysis of IF statements, Nested If, Count(), Countif(), Countifs(), Sum(), Sumif(), Sumifs(), Average(), Look up functions - VLOOKUP, HLOOKUP, INDEX and MATCH.

**Module 4 - Pivot Table & its applications (CO4) Hours (18)**

Data Analysis using Pivot Tables: Using the Pivot Table Wizard- Changing the pivot table layout- Formatting- Grouping items- Inserting calculated fields- Pivot Table Options. Pivot Chart- Using Slicer in pivot Tables- Applying and Using AutoFilter- Creating a Custom AutoFilter- Sorting On More Than One Column- Using Advanced Filter- Using Formulas In Criteria

## **LEARNING RESOURCES**

### **Textbook**

- Walkenbach- John. (2010). Excel 2010 Bible. New Delhi: Wiley India Pvt Ltd.
- Ragsdale- Cliff. T. (2008). Spreadsheet Modelling and Decision Analysis. New York: Thomson south – western publications.
- Monahan- George E. (2000). Management Decision Making: Spread Sheet- Modelling- Analysis. London: Cambridge University

### **References**

1. Ansari, N. (2023, April 29). Spreadsheet Modeling and it's Role in 21st Century - Naila Ansari - Medium. *Medium*. <https://medium.com/@nayla.khaleel202/spreadsheet-modeling-and-its-role-in-21st-century-a0258e6d21b>
2. Caine, D. J., & Robson, A. J. (1993). Spreadsheet Modelling: Guidelines for model development. *Management Decision*, 31(1). <https://doi.org/10.1108/00251749310023166>

**QUESTION PAPER BLUE PRINT**  
**BA1C04TM25 - SPREADSHEET MODELLING AND DECISION ANALYSIS**  
**BLUE PRINT**  
**Internal**

<b>No</b>	<b>Components</b>	<b>Weightage</b>
1	Lab Test	5
2	Lab Record	5
3	Viva	5
	<b>TOTAL</b>	<b>15</b>

**External**

<b>No</b>	<b>Components</b>	<b>Weightage</b>
1	Application of formula & functions	10
2	Data Analysis	10
3	Results Presentation	10
	<b>TOTAL</b>	<b>30</b>

## **SYLLABI FOR SEMESTER II**

**SEMESTER II**

**BA2C05TM25 - DATA MINING FOR BUSINESS ANALYTICS**

**CREDITS: 4**

**TOTAL LECTURE HOURS: 90**

**COURSE OUTCOMES**

**CO1** Apply fundamental data mining concepts to analyse large datasets (Apply)

**CO2** Illustrate various data mining techniques to extract meaningful patterns from data (Analyse)

**CO3** Evaluate the data mining process, including data cleaning, transformation, integration, and discretization, to improve data quality (Evaluate)

**CO4** Evaluate data mining techniques for segmentation and forecasting to optimize business strategies (Analyse)

**CO5:** Assess the applications of data mining in domains such as marketing, HR, finance, retail and telecommunications (Evaluate)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	1	2	1	1
<b>CO2</b>	3	1	2	1	1
<b>CO3</b>	3	1	2	1	1
<b>CO4</b>	1	1	2	1	3
<b>CO5</b>	1	1	1	2	3

**SYLLABUS CONTENT**

**Module 1: Introduction to Data Mining (CO1)**

**Hours (18)**

Introduction - Definition of Data Mining - Data mining parameters – Working of Data Mining - Types of relationships - Architecture of Data Mining - Data Mining Process: CRISP-DM and SEMMA Framework, Data Preprocessing: Data Cleaning, Handling Missing Values, Data Transformation - Feature Engineering and Feature Selection for Business Applications

**Module 2 - Data Exploration and Pattern Discovery (CO2)**

**Hours (18)**

Data Cleaning, Data Integration, Data Reduction, Data Transformation and Data Discretization, Data Mining, Pattern, Evaluation, Knowledge Representation, Association Rule Mining: Apriori Algorithm and Market Basket Analysis, Dimension Reduction: Factor Models and Principal Components, Text as Data: Text Mining and Sentiment Analysis

**Module 3 - Classification and Prediction Techniques (CO3) Hours (18)**

Supervised Learning Overview: Classification vs. Regression, Decision Trees and Random Forests for Business Decision Making, Naïve Bayes Classifier and its Applications in Marketing and Risk Analysis, Logistic Regression for Binary Classification, Model Evaluation Metrics: Accuracy, Precision, Recall, F1-Score, ROC Curve

**Module 4 - Clustering and Segmentation Techniques (CO4) Hours (18)**

Introduction to Unsupervised Learning, Clustering Techniques: K-Means, Hierarchical Clustering, DBSCAN, Customer Segmentation using Clustering Techniques, Text Mining and Sentiment Analysis for Business Insights, Model Validation Techniques: Silhouette Score, Davies-Bouldin Index

**Module 5: Advanced Topics in Data Mining and Business Applications (CO5) Hours (18)**

Neural Networks and Deep Learning for Business Analytics, Ensemble Learning Techniques: Boosting, Bagging, Stacking, Time Series Forecasting using Data Mining Techniques, Fraud Detection using Data Mining in Financial Applications, Ethical Considerations and Challenges in Data Mining

**LEARNING RESOURCES**

**Text Books**

- Han, J., Kamber, M., & Pei, J. (2011). *Data Mining: Concepts and Techniques*. Elsevier.
- Shmueli, G., Bruce, P. C., & Patel, N. R. (2016). *Data mining for business analytics: Concepts, Techniques, and Applications with XLMiner*. John Wiley & Sons.

**References**

1. Snowflake. <https://www.snowflake.com/trending/data-mining-for-business-analytics/>
2. Matillion. (2023, June 16). *5 Data mining & business intelligence examples*. Matillion. <https://www.matillion.com/blog/5-data-mining-business-intelligence-examples>

**SEMESTER II**

**BA2C06TM25 MANAGEMENT DECISION SCIENCE**

**CREDITS: 4**

**TOTAL LECTURE HOURS: 90**

**COURSE OUTCOMES**

**CO1:** Illustrate real-world business problems mathematically using linear programming techniques (Apply)

**CO2:** Compute mathematical models, such as network models, to solve real-life problems (Apply)

**CO3:** Identify risks under certainty and uncertainty to find solutions to business problems (Understand)

**CO4:** Analyse time series data using various forecasting techniques (Analyse)

**CO5:** Recommend optimization techniques in different business scenarios for achieving operational efficiency (Evaluate)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	1	2	1	2
<b>CO2</b>	3	1	2	1	2
<b>CO3</b>	1	1	2	1	3
<b>CO4</b>	3	1	2	1	2
<b>CO5</b>	3	1	2	1	3

**SYLLABUS CONTENT**

**Module 1 - Linear Programming (CO1)**

**Hours (18)**

Introduction, Problem Formulation-LPP, Graphical method, Special cases, Multiple decision variables-Simplex method, Sensitivity Analysis.

**Module 2 - Distribution and Network Models (CO2)**

**Hours (18)**

Transportation Problems, Transportation Algorithms, MODI method, Assignment problem, Unbalanced problems, Hungarian method. Network analysis-Introduction-, Network models,

Transshipment Problem, Shortest-Route and Maximal Flow Problem, Critical Path Method (CPM), PERT.

**Module 3 - Decision Theory (CO3)**

**Hours (18)**

Introduction to decision making, pay off table, Regret table, Decision making under uncertainty and Decision making under certainty, Decision under risk, Decision tree, Uses of decision trees, Breakeven analysis under uncertainty.

**Module 4 - Game Theory and Forecasting (CO4)**

**Hours (18)**

Introduction, Theory of games – Two-person zero sum game, Maximin - minimax principle, Dominance principle, Pure and mixed strategy games, Graphical method. Time Series Forecasting - Time Series, Components, Autocorrelation, Statistical forecasting techniques-Free hand, Smoothing techniques, Exponential smoothing.

**Module 5 - Simulation and Optimization Techniques (CO5)**

**Hours (18)**

Introduction to Simulation: Monte Carlo Simulation, Importance in Business Analytics, Steps in Simulation Process, Applications in Business Decision-Making, Queuing Models: Basics, Single and Multi-Server Models, Applications in Operations, Markov Chains and Decision Processes, State Transition Probability Matrix, Optimization Techniques: Non-Linear Programming, Dynamic Programming, Integer Programming, Applications of Simulation and Optimization in Supply Chain, Finance, and Marketing

**LEARNING RESOURCES**

**Textbooks**

- J K Sharma (2013). *Operations Research*. Haryana: Macmillan.
- Sweeney, Dennis J., et al. (2008). *Introduction to Management Science*. Mason: Cengage Learning.
- Vohra, N. D. (2006). *Quantitative Techniques in Management*. New Delhi: Tata McGraw Hill.
- Srivastava, U. K, G. V. Shenoy and S. C. Sharma. (2005). *Quantitative Techniques for Managerial Decisions*. New Delhi: New Age International Ltd.
- Wisniewski, Mik. (2009). *Quantitative Methods for Decision Makers*. London: Prenticehall publications.

- Gupta, M. P. and R. B. Khanna. (2009). *Quantitative Techniques for Decision Making*. New Delhi: PHI Learning Private Limited.

## References

1. *Decision Science in Business and Management* | Mu sigma. (n.d.). Mu-sigma. <https://www.mu-sigma.com/decision-science/>
2. *Decision science*. (n.d.). Explanation & Examples | Secoda. <https://www.secoda.co/glossary/decision-science>
3. *Decision Sciences* | IIM Bangalore. (n.d.). [https://www.iimb.ac.in/programmes/doctoral-programme/specializations/decision\\_sciences](https://www.iimb.ac.in/programmes/doctoral-programme/specializations/decision_sciences)

**SEMESTER II**

**BA2C07TM25 BUSINESS RESEARCH METHODS**

**CREDITS: 4**

**TOTAL LECTURE HOURS: 90**

**COURSE OUTCOMES**

**CO1:** Apply fundamental research concepts to develop structured and effective business research. (Apply)

**CO2:** Analyse various data measurement scales and scaling techniques to design and implement effective measurement tools in business research (Analyse)

**CO3:** Illustrate proficiency in sampling techniques, data collection methods, and questionnaire design, ensuring high-quality data gathering and effective report writing (Analyse)

**CO4:** Apply statistical techniques for hypothesis testing using SPSS to derive meaningful business insights (Apply)

**CO5:** Illustrate an understanding of research publication ethics and the use of reference tools for effective academic writing (Analyse)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	1	3	1	1	1
<b>CO2</b>	1	3	1	1	1
<b>CO3</b>	2	3	1	1	1
<b>CO4</b>	2	3	2	2	1
<b>CO5</b>	1	1	2	1	3

**SYLLABUS CONTENT**

**Module 1 - Introduction to Research (CO1)**

**Hours (18)**

Business Research - an Overview – Nature, Scope, Objectives, and Motivation of research. Types of Research, Research Process – Descriptive, Exploratory, Experimental. Research Understanding the language of research – Concept, Construct, Definition, Variable. Problem Identification & Formulation – Research Question - – Hypothesis – Qualities of a good Hypothesis –Null Hypothesis & Alternative Hypothesis. Hypothesis Testing – Logic & Importance

**Module 2 - Research Design (CO2)**

**Hours (18)**

Design – Concepts and steps in research design. Types of research design, features of good research design. Types of Data- Primary and Secondary Data, Advantages & Disadvantages. Scales of Measurement-Nominal, Ordinal, Interval & Ratio. Importance of scaling, and , Criteria for good measurement, attitude measurement - Attitude measurement scale – Likert's Scale, Semantic Differential Scale, Thurston scale, Multi-Dimensional Scaling - Scaling techniques- Paired comparison, rank order, constant sum, semantic differential, itemized ratings, Likert Scale

**Module 3 - Data Collection (CO3)**

**Hours (18)**

Sampling techniques- Probability and Non-probability Sampling, determination of sample size; Data Collection Tools- Survey & Observation Methods, Qualitative Research Tools: Depth Interviews, focus groups, projective techniques; Questionnaire-form & design. Questionnaire Design Process, Requirements of a Good questionnaire.

**Module 4 - Application using SPSS (CO4)**

**Hours (18)**

Outlier assessment- Normality assessment through Histogram, Probability Plot, Q-Q Plot, Normality tests- Shapiro-Wilk and Kolmogorov Smirnov Test of Normality; Application in SPSS- Bar Charts, Pie Charts, Box Plots, Stem and Leaf Diagram, Histogram, Mean Plot. Independent samples t test, paired t test, Chi square test, ANOVA, Factor Analysis, Discriminant Analysis, Correlation and Regression.

**Module 5 - Interpretation of Data and Paper Writing (CO5)**

**Hours (18)**

Layout of a Research Paper, Impact factor of Journals, When and where to publish, Ethical issues related to publishing, Plagiarism and Self-Plagiarism, Use of tools / techniques for Research, Reference Management Software like Zotero/Mendeley

**LEARNING RESOURCES**

**Text books**

- Naresh K. Malhotra (2018) Marketing Research: An Applied Orientation, Pearson, New Delhi
- Zikmund, Babin & Carr(2010): Business Research Methods, South-Western.
- Cooper, D., & Schindler, P. S. (1999). *Business research methods: Casebook*. Irwin/McGraw-Hill.

## References

1. *Research Methods | Definitions, Types, Examples.* (n.d.). Research Methods | Definitions, Types, Examples. <https://www.scribbr.com/category/methodology/>
2. Sumeracki, M. (2023, September 18). *Different research methods: strengths and weaknesses — the learning scientists.* The Learning Scientists. <https://www.learningscientists.org/blog/2018/3/8-1>

**SEMESTER II**

**BA2C08TM25- BUSINESS FINANCE**

**CREDITS: 4**

**TOTAL LECTURE HOURS: 90**

**COURSE OUTCOMES**

**CO1:** Calculate present value of money. (Apply)

**CO2:** Evaluate different investment proposals by using capital budgeting techniques. (Evaluate)

**CO3:** Prepare EBIT-EPS Analysis. (Apply)

**CO4:** Differentiate primary and secondary market. (Understand)

**CO5:** Explain fundamental and technical analysis. (Understand)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	1	1	3	1	2
<b>CO2</b>	3	1	3	1	3
<b>CO3</b>	3	1	3	1	3
<b>CO4</b>	2	1	3	1	2
<b>CO5</b>	2	1	3	1	3

**SYLLABUS CONTENT**

**Module 1 - Financial Management (CO1)**

**Hours (18)**

Financial Management: meaning, nature and objectives of financial management, Time Value of Money- meaning and techniques, Cost of Capital. Working Capital Management- meaning, classifications, factors influencing, Inventory Management- meaning, Cash Management- meaning, Receivables Management- meaning.

**Module 2 - Investment Decision (CO2)**

**Hours (18)**

Capital Budgeting: meaning, Investment evaluation criteria -Net Present Value, Internal Rate of Return, Profitability Index, Payback Period, Discounted Payback Period, ARR, Capital rationing.

**Module 3 - Financing Decision & Dividend Decision (CO3)**

**Hours (18)**

Leverage: Operating Leverage, Financial Leverage and Combined Leverage. EBIT-EPS Analysis  
Capital Structure: Concept, importance and theories of Capital Structure, Net Operating Income Approach, Net Income Approach, Traditional Approach and M.M. Hypotheses – without taxes

and with taxes. Dividend Decision Dividend Policies: Concept, types of Dividends and forms of Dividend policy and factors influencing dividend decisions, Dividend Theories: Irrelevance theory, MM hypothesis, Relevance Theories: Walter's model and Gordon's model. (Only theory)

**Module 4 - Indian Financial System (CO4)**

**Hours (18)**

Indian Financial system- Financial Markets, Financial Assets, Financial Services, Financial Instruments and Financial Institutions. Primary market, modes of issue in new issue market, book building process, intermediaries in primary market. Secondary Markets- Role of stock exchanges, intermediaries, settlement procedures, trading mechanism.

**Module 5 – Security Analysis (CO5)**

**Hours (18)**

Investor, Speculator. investment vs. speculation. Security Analysis – meaning, systematic risk & unsystematic risk. Fundamental analysis- economic analysis, industry analysis, company analysis. Technical analysis- Dow theory, Elliot wave principle, Charts, Trend analysis etc. Fundamental analysis vs Technical analysis.

**LEARNING RESOURCES**

**Textbooks**

- Pandey, I. M. Financial Management. New Delhi: Vikas Publishers
- Chandra, Prasanna. Financial Management. New Delhi: Tata McGraw-Hill Education.
- Bhole, L. M. Financial Institutions and Markets– Structure, Growth and Innovations. New Delhi: McGraw Hill.
- Security Analysis and Portfolio Management–Punithavathy Pandian, Vikas Publishing House Pvt. Ltd.
- Security Analysis and Investment Management – O.P. Agarwal, Himalaya Publishing House

**References**

1. Bernstein, C. (2025, January 15). *What is financial analytics and why is it important?* Search ERP. <https://www.techtarget.com/searcherp/definition/financial-analytics>
2. *What is Financial Analytics? Best Practices | Qlik.* (n.d.). Qlik. <https://www.qlik.com/us/data-analytics/financial-analytics>

**SEMESTER II**

**BA2C02PM25 - ANALYTICS WITH R**

**CREDITS: 3**

**TOTAL PRACTICAL HOURS: 90**

**COURSE OUTCOMES**

**CO1:** Apply fundamental R programming concepts to handle structured data effectively (Apply)

**CO2:** Explain R programming algorithms for statistical analysis and data visualization (Analyse)

**CO3:** Illustrate inferential statistical methods in R to draw meaningful conclusions from data (Analyse).

**CO4:** Evaluate advanced machine learning techniques to analyse complex datasets (Evaluate)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	2	1	1
<b>CO2</b>	3	3	2	1	1
<b>CO3</b>	3	3	2	1	1
<b>CO4</b>	3	3	2	1	1

**SYLLABUS CONTENT**

**Module 1 - Fundamentals of R (CO1)**

**Hours (18)**

An Introduction to R: What is R?, Installing R, Features of R, Variables in R, Data Objects in R, Constants in R, Operators in R, Datatypes in R, Import and Export, Important Built-in functions, Vectors, Control Statements, Functions in R, Matrices, Lists, Strings, Dates, Arrays, installing packages in R

**Module 2 - Descriptive Statistics and Tabulation using R (CO2)**

**Hours (18)**

Data Analysis Using R Objects Data, Computing mean, median, mode, standard deviation and variance, range, interquartile range. Graphical Displays: Barplot, Histogram, Boxplot, Scatterplot, Line plot, QQ-plot, Density plot. Advanced descriptive statistics - freq(), ctable(), descr(), Data frame summaries with df Summary()

**Module 3 - Inferential Statistics using R (CO3)**

**Hours (18)**

Choosing the right test, t test, ANOVA - one way, two-way, Chi Square, Correlation, Simple Linear Regression Analysis

**Module 4 - Advanced Analysis using R (CO4)**

**Hours (18)**

Decision Trees, Random Forest, Classification - Logistic Regression, Naive Bayes classifier, Clustering - K Means, Hierarchical, DBSCAN, Association rules

**LEARNING RESOURCES**

**Text Books**

- Wickham, H., & Grolemund, G. (2016). R for Data science: Import, Tidy, Transform, Visualize, and Model Data. "O'Reilly Media, Inc."
- Ohri, A. (2012). R for Business Analytics. Springer Science & Business Media.

**References**

1. GeeksforGeeks. (2024b, September 4). *Data analysis using R*. GeeksforGeeks. <https://www.geeksforgeeks.org/data-analysis-using-r/>
2. Sisense. (2025, March 25). *What is R Analytics? Data analytics with R explained*. <https://www.sisense.com/glossary/r-analytics/>

## **SYLLABI FOR SEMESTER III**

**SEMESTER III**

**BA3C09TM25 - TIME SERIES ECONOMETRICS**

**CREDITS: 4**

**TOTAL LECTURE HOURS: 90**

**COURSE OUTCOMES**

**CO1:** Apply time series decomposition techniques to identify and analyse trend, seasonal, cyclical, and irregular variations in data (Apply)

**CO2:** Evaluate univariate time series models for forecasting real-world data (Evaluate)

**CO3:** Analyse multivariate time series models to understand relationships between financial and economic variables (Analyse)

**CO4:** Illustrate volatility modeling techniques like ARCH/GARCH to assess and forecast financial risks in time series data (Apply)

**CO5:** Illustrate time series modeling results, forecasting decisions, and implications articulately (Analyse)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	1	2	1	2
<b>CO2</b>	3	1	2	1	3
<b>CO3</b>	3	1	2	1	2
<b>CO4</b>	3	1	2	1	2
<b>CO5</b>	2	1	1	2	3

**SYLLABUS CONTENT**

**Module 1 - Time Series Forecasting (CO1)**

**Hours (18)**

Time series analysis, Components of time series: Trend, Seasonal, Cyclical and Irregular variations, Time series decomposition models, Methods of forecasting – Free hand, Smoothing techniques, Exponential smoothing, Holt's method, Measurement of errors in forecasting – MAD, MAPE, MSD.

**Module 2 - Univariate Time Series Modelling and Forecasting (CO2) Hours (18)**

Autocorrelation, Partial autocorrelation, Time series models – Auto Regressive (AR), Moving Average (MA), ARMA, Stationarity, Auto Regressive Integrated Moving Average (ARIMA) models, Unit root tests – Augmented Dickey Fuller (ADF) test, Seasonality, Tests of random walk (weak market efficiency), Spurious regression.

**Module 3 - Volatility Patterns and their applications (CO3) Hours (18)**

Introduction to financial time series - Basic returns data characteristics, Asymmetry and fat tails, Historical volatility, Volatility estimator used by RISKMETRICS model, High frequency volatility, Multivariate time series - Introduction, Granger causality, Co-integration, Vector Auto Regression (VAR) models - estimation and testing, Impulse response and Variance decomposition, Error-correction models - estimation and testing - relationship between international stock indices, Lifetime Value models, Credit-Scoring models, Loss - forecasting models.

**Module 4 - Time Series Volatility ARCH/GARCH Models (CO4) Hours (18)**

Auto Regressive Conditional Heteroscedasticity (ARCH), Generalized Auto Regressive Conditional Heteroskedasticity (GARCH), Asymmetric GARCH and other extensions, Options implied volatility versus GARCH, Value at risk (VaR), Downside risk (Expected Shortfall), Credit risk.

**LEARNING RESOURCES**

**Textbooks**

- Hamilton, J. D. (1994). *Time Series Analysis*. Princeton University Press.
- Enders, W. (2010). *Applied Econometric Time Series*. Hoboken, NJ: John Wiley & Sons.
- Zivot, Eric and Jiahui (Jeffery). (2002). *Modelling Financial Time Series with S-PLUS*. Wang: Springer-Verlag.

**References**

1. GeeksforGeeks. (2024b, August 13). *Time series analysis and forecasting*. GeeksforGeeks. <https://www.geeksforgeeks.org/time-series-analysis-and-forecasting/>

**SEMESTER III**

**BA3C10TM25 MULTIVARIATE DATA ANALYSIS**

**CREDITS: 4**

**TOTAL LECTURE HOURS: 90**

**COURSE OUTCOMES**

**CO1:** Explain the fundamental concepts, classification, and structured approach to multivariate analysis. (Apply)

**CO2:** Apply data preprocessing techniques, including handling missing data, outliers, and nonmetric data transformation to ensure reliability of multivariate analysis (Apply)

**CO3:** Illustrate factor analysis to identify underlying relationships between variables and reduce data dimensionality (Apply)

**CO4:** Evaluate regression and discriminant analysis techniques to model relationships, classify data, and make predictions in real-world scenarios. (Analyse)

**CO5:** Illustrate Structural Equation Models (SEM) using tools like LISREL or AMOS to explore latent variables and complex dependencies in data (Analyse).

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	2	1	1	1
<b>CO2</b>	3	2	1	1	1
<b>CO3</b>	3	2	1	1	1
<b>CO4</b>	3	2	1	1	1
<b>CO5</b>	3	3	1	2	1

**SYLLABUS CONTENT**

**Module 1 - Overview of Multivariate Statistics (CO1) Hours (18)**

Multivariate analysis - Introduction, Some basic concepts of multivariate analysis, classification of multivariate techniques, types of multivariate techniques, Guidelines for Multivariate analyses and interpretation, Structured approach to Multivariate model building.

**Module 2 - Data Cleaning and Multivariate Techniques (CO2) Hours (18)**

Graphical examination of the Data, Missing data, Outliers, Testing the assumptions of multivariate analysis, Incorporating nonmetric data with dummy variables, Missing Value Imputation Data transformation

**Module 3 – Dimensionality Reduction (CO3) Hours (18)**

Introduction - Factor analysis, a hypothetical example of factor analysis, Factor analysis decision process, an illustrative example. Multidimensional Scaling, A decision framework for perceptual mapping

**Module 4 –Regression and Discriminant Analysis (CO4) Hours (18)**

Introduction, Simple regression, An example of simple regression, Multiple regression analysis, Logistic regression: regression with a binary dependent variable, Multiple Discriminant Analysis Introduction - Discriminant analysis and Logistic regression, Analogy with regression and Multivariate Analysis of Variance (MANOVA).

**Module 5 – Dependence Techniques (CO5) Hours (18)**

Structural Equation Modelling – Latent variables, Measurement model, path analysis, structural model, LISEREL/ AMOS

**LEARNING RESOURCES**

**Textbooks**

- Hair, J. F. et al. (2006). *Multivariate Data Analysis*, 6th edition. NJ: Prentice Hall.
- Tabachnick, B. and Fidell, L (2007). *Using Multivariate Statistics*, 5th edition. New York: Allyn & Bacon.
- Cohen, J., & Cohen, P. (1983). *Applied Multiple Regression/Correlation Analysis for the Behavioural Sciences*, 2nd edition. Hillsdale, N.J.: Erlbaum.

**References**

1. GeeksforGeeks. (2024a, February 11). *Univariate, Bivariate and Multivariate data and its analysis*. GeeksforGeeks. <https://www.geeksforgeeks.org/univariate-bivariate-and-multivariate-data-and-its-analysis/>
2. Dutta, B. (n.d.). *What is Multivariate Data Analysis? | Analytics Steps*. <https://www.analyticssteps.com/blogs/what-multivariate-data-analysis>

**SEMESTER III**

**BA3C11TM25 - FINANCIAL MODELLING**

**CREDITS: 4**

**TOTAL LECTURE HOURS: 90**

**COURSE OUTCOMES**

**CO1:** Apply financial models using Excel, incorporating spreadsheet functionalities (Apply)

**CO2:** Analyse financial statements to make data-driven decisions (Analyse)

**CO3:** Illustrate Financial Forecasting and Valuation to build accurate financial projections and valuation models (Analyse)

**CO4:** Assess financial risks using sensitivity analysis techniques in Excel (Evaluate)

**CO5:** Develop a comprehensive equity research model (Apply)

**Mapping of Course Outcomes with Program Specific Outcomes**

Mapping	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	1	2
CO2	3	3	2	1	2
CO3	3	3	1	1	2
CO4	1	3	1	1	2
CO5	1	3	1	1	2

**SYLLABUS CONTENT**

**Module 1: Introduction to Financial Modelling (CO1) Hours (18)**

Overview of Financial Modelling, Importance and Applications in Finance, Basics of Excel for Financial Modelling, Excel basics- - Excel features-financial – logical- statistical - mathematical, lookup reference. Custom formatting- shortcuts- array functions - pivot tables analysis – Tool pack-nested-cell references -named ranges-working with dates-linking external file- Useful windows keyboard, shortcuts for financial modellers.

**Module 2: Analysis of Financial Statements (CO2) Hours (18)**

Introduction to Financial Statement Analysis, Financial Reporting Mechanics, Understanding Income Statement, Balance Sheet, Cash Flow Statement, Financial Analysis Techniques, Inventories, Long Lived Assets, Non-Current Liabilities, Financial Statement Application

**Module 3: Financial Models (CO3) Hours (18)**

Analysis and interpretation of financial statements- trend analysis - common sized statements- comparative statement-Time value of money – meaning, techniques, applications, Loan amortization table-Financial planning and investment portfolios. Finance Functions in Excel- Investment analysis functions- Bond Functions, Depreciation Functions

**Module 4: Sensitivity Analysis using Excel (CO4) Hours (18)**

What-If Analysis: Scenario Manager, DataTables, Goal Seek, Quadratic Equation Solver: Transportation Problem, Assignment Problem-Case Exercises/ Practical Assignments/ Activities.

**Module 5: Equity Research Modeling (CO5) Hours (18)**

Prepare an Income Statement, Balance sheet, Cash Flow Statement, Geographic Revenue Sheet, Segment Revenue Sheet, Cost Statement, Debt Sheet, Analyze Revenue Drivers Forecast Geographic & Segment Revenues, Cost Statement, Debt, Income Statement, Balance Sheet, and Cash Flow Statement. Perform Adjustments, Income Statement - Compute Margins, Balance Sheet -Compute Ratios Cash Flow Statement Projection, Valuation- Discounted Cash Flow Method (DCF), Valuation – Relative Valuation (Football Field Chart)

**LEARNING RESOURCES**

**Text Books**

- Financial Modelling by Simon Benninga
- Alastair Day, Mastering Financial modeling in Microsoft Excel; Pearson, India Edition
- Building Financial Models, John Tjia, McGraw-Hill

**References**

1. Jonathan Swan, *Practical Financial Modelling a guide to current practice*, 2nd edition, CIMA publishing Publication, 2005.
2. Marek Musiela, Marek Rutkowski, *Models in Financial Modelling*. 2nd Edition, Springer, 2005.
3. Chandan Sengupta, *Financial Analysis and Modelling Using Excel and VBA*, Wiley, 2014

**SEMESTER III**

**BA3C03PM25 - DATA SCIENCE USING PYTHON**

**CREDITS: 3**

**TOTAL PRACTICAL HOURS: 72**

**COURSE OUTCOMES**

**CO1:** Apply data preprocessing techniques to prepare datasets for analysis using python programming (Apply)

**CO2:** Analyse data using Python libraries like NumPy and Pandas for efficient data manipulation, analysis, and handling large datasets (Analyse)

**CO3:** Evaluate machine learning algorithms using Scikit-learn and Light for classification, regression, clustering, and anomaly detection. (Evaluate)

**CO4:** Illustrate insightful data visualizations using Plotly, Matplotlib, and Seaborn to effectively communicate analytical findings. (Apply)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	2	1	1
<b>CO2</b>	3	3	2	1	1
<b>CO3</b>	3	3	1	1	2
<b>CO4</b>	1	3	1	3	1

**SYLLABUS CONTENT**

**Module 1 - Python for Data Science (CO1)**

**Hours (18)**

Data Science Introduction – Introduction to Python- Python Installation and setup - Introduction to data Pre-processing – Importing Libraries – Importing Dataset – Data Wrangling - Working with missing data, formatting data to standardize it, encoding categorical data- Splitting Dataset into train and test data – feature scaling

**Module 2 - Data Analysis with python libraries (CO2)**

**Hours (18)**

Numpy Introduction – Numpy Arrays – Indexing and Selection –Numpy Operations. Introduction To Pandas – Data Frames- Multi Index and Index Hierarchy – Working with missing data – Groupby Function- merging, joining and concatenating Data Frames – Pandas Operation - Reading and Writing files, TensorFlow and PyTorch - building and training neural networks.

**Module 3 – Machine Learning Algorithms (CO3)**

**Hours (18)**

Scikit-learn – for classification, regression, clustering, and dimensionality reduction. Clustering, classification, regression, model selection, dimensionality reduction.

LightGBM - Anomaly detection, Time series analysis, Natural language processing

#### **Module 4 - Data Visualization (CO4)**

**Hours (18)**

Data Visualization With Plotly & Matplotlib Library - line plots, scatter plots, barcharts, histograms, pie charts etc. Seaborn - basic plots using seaborn, Plotting graph using Seaborn.

#### **LEARNING RESOURCES:**

##### **Text Books**

- Ljubomir Perkovic, —*Introduction to Computing Using Python: An Application Development Focus*, Wiley, 2012.
- Charles Dierbach, —*Introduction to Computer Science Using Python: A Computational Problem-Solving Focus*, Wiley, 2013.
- Allen B Downey, —*Think Python*, Oreilly, 2012
- Dr.Varghese Paul, Dr.Anjana S.Chandran,|| *Introduction To Computing And Problem Solving Using Python*||, Educational Publishers And Distributors, 2016

##### **References**

1. *Python for beginners*. (n.d.). Python.org. <https://www.python.org/about/gettingstarted/>
2. GeeksforGeeks. (2025, April 18). *Python Tutorial | Learn Python Programming Language*. GeeksforGeeks. <https://www.geeksforgeeks.org/python-programming-language-tutorial/>

**SEMESTER III**

**BA3C04PM25 - DATA VISUALIZATION USING TABLEAU & POWER BI**

**CREDITS: 3**

**TOTAL PRACTICAL HOURS: 72**

**COURSE OUTCOMES**

**CO1:** Apply data preparation techniques such as data cleaning, transformation, and blending to enhance visualization accuracy. (Apply)

**CO2:** Develop interactive dashboards by using Tableau and Power BI visualization tools present data effectively. (Apply)

**CO3:** Illustrate advanced analytics features including calculated fields, parameters, and forecasting to derive meaningful insights from data. (Analyse)

**CO4:** Develop advanced analytics features and custom calculations for in-depth analysis (Apply)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	2	2	3	1
<b>CO2</b>	2	1	2	3	1
<b>CO3</b>	2	1	1	3	2
<b>CO4</b>	1	1	1	3	1

**SYLLABUS CONTENT**

**Module 1 – Introduction to Tableau (CO1)**

**Hours (18)**

Installing Tableau Desktop and Public, connecting to data, Relationships, features of Tableau, Connecting to Data Sources: Importing CSV, Excel, Databases, and Cloud Data, Understanding Data Types and Data Preparation in Tableau, Creating Basic Charts: Bar Chart, Line Chart, Pie Chart, Scatter Plot

**Module 2 - Data Visualization and Analytics in Tableau (CO2)**

**Hours (18)**

Dual-Axis and Combined Charts: Advanced Visualization, Calculated Fields and Table Calculations, Trend Lines, Forecasting, and Statistical Analysis, Actions, Filters, and Storytelling with Data, Dashboard Design Principles: Building the First Dashboard

**Module 3– Fundamentals of Power BI and Data Modeling (CO3)**

**Hours (18)**

Introduction to Power BI - Overview, Features, and Workflow, Connecting to Data Sources, Data Cleaning and Transformation with Power Query, Understanding Data Modeling: Relationships, Joins, and Keys, Creating Basic Visualizations: Bar Charts, Line Charts, Pie Charts, and Tables, filters, Slicers, and Drill-Throughs for Interactive Reports

**Module 4 - Data Visualization using PowerBI (CO4)**

**Hours (18)**

Introduction to DAX (Data Analysis Expressions): Measures vs. Calculated Columns, Advanced DAX Functions: Aggregations, Time Intelligence, and Calculated Tables, Geographic Data Visualization: Maps and Geospatial Analysis, Advanced Analytics: Forecasting, Clustering, and Trend Analysis

**LEARNING RESOURCES**

**Text Books**

- Milligan, J. N., & Santos, D. (2017). *Tableau 10 Bootcamp*. Packt Publishing.
- Chaturvedi, A., & Malik, P. (2024). *Mastering Data Visualization with Tableau: Empowering business decisions with Tableau (English Edition)*. BPB Publications.
- Sarka, D., Rihar, J., & Vončina, K. (2023). *Advanced Analytics with Power BI and Excel: Learn powerful visualization and data analysis techniques using Microsoft BI tools along with Python and R*. Orange Education Pvt Ltd.
- Russo, M., & Ferrari, A. (2019). *The Definitive Guide to DAX: Business intelligence for Microsoft Power BI, SQL Server Analysis Services, and Excel*. Microsoft Press.

**References**

1. GeeksforGeeks. (2024c, July 4). *Tableau tutorial*.  
GeeksforGeeks. <https://www.geeksforgeeks.org/tableau-tutorial/>

**SEMESTER III**  
**BA3PRM25 - PROJECT REPORT**

**CREDITS: 2**

**TOTAL LECTURE HOURS: 36**

**COURSE OUTCOMES**

**CO1:** Apply Business Analytics Frameworks – Develop and execute a structured approach to business analytics projects (Apply)

**CO2:** Evaluate Analytical Models in R, utilizing appropriate evaluation metrics to derive meaningful business insights (Evaluate)

**CO3:** Develop interactive dashboards to communicate data Insights using R libraries (Apply)

**CO4:** Illustrate professional analytics insights through detailed reports (Analyse)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	2	2	2	3	3
<b>CO2</b>	2	2	2	3	3
<b>CO3</b>	1	2	1	2	3
<b>CO4</b>	1	2	1	2	3

**SYLLABUS CONTENT**

**Module 1 - Business Analytics Project Execution Framework (CO1) Hours (9)**

Introduction to Business Analytics Project Lifecycle, Problem Definition and Business Understanding, Data Collection and Preprocessing, Exploratory Data Analysis (EDA) using R, Data Cleaning and Handling Missing Values

**Module 2: Model Development and Evaluation (CO2) Hours (9)**

Feature Engineering and Data Transformation in R, Descriptive Analytics – Mean, Median, Mode and other relevant statistics. Model Selection (Regression, Classification, Clustering), Model Evaluation Metrics (Confusion Matrix, RMSE, R-Squared, Precision/Recall, etc.)

**Module 3: Data Visualization and Business Insights Communication (CO3) Hours (9)**

**CO3:** Develop interactive dashboards to communicate data Insights using R libraries (Apply)

Data Visualization Techniques in R (ggplot2, plotly, etc.), Creating Interactive Dashboards with Shiny, Interpreting and Presenting Analytical Findings, Storytelling with Data: Best Practices for Visualization, Writing Executive Summaries for Business Stakeholders

**Module 4: Report Writing and Project Documentation (CO4)**

**Hours (9)**

Structuring a Business Analytics Report (Abstract, Introduction, Methodology, Results, Conclusion), Documenting R Code and Analytical Processes, Best Practices for Reproducible Research (Markdown, R Notebooks), Presenting Insights through Reports and Slide Decks, Ethical Considerations in Business Analytics Reporting

## **SYLLABI FOR SEMESTER IV**

**SEMESTER IV**

**BA4C12TM25 - MANAGERIAL ECONOMICS**

**CREDITS: 4**

**TOTAL LECTURE HOURS: 90**

**COURSE OUTCOMES**

**CO1:** Describe the necessity and applicability of economic concepts in organisational context (Understand)

**CO2:** Apply insights on analysing market demand and interpreting forecasts that impact business scenarios (Apply)

**CO3:** Infer the relationship between Consumption Functions and Economies of Scale (Analyse)

**CO4:** Assess the impact of market supply to production functions towards maintaining equilibrium in market (Evaluate)

**CO5:** Explain different market structures and pricing decisions (Apply)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	1	1	2	1	3
<b>CO2</b>	1	1	2	1	3
<b>CO3</b>	1	1	2	1	3
<b>CO4</b>	1	1	2	1	3
<b>CO5</b>	1	1	2	1	3

**SYLLABUS CONTENT**

**Module 1- Introduction to Managerial Economics (CO1)**

**Hours (18)**

Meaning & Definition - Features of Managerial Economics -Scope of Managerial Economics - Objectives -Role and Responsibilities of - Business Economist to modern Business Management.

**Module 2 - Business Cycle (CO2)**

**Hours(18)**

Phases of a business cycle Economic approach – Circular flow of activity – Economic system - features- capitalistic- socialistic- mixed economy. Inflation : Definition, courses of inflation, Banking: Functions of Central Bank – Functions of commercial banks, Monetary Policy and Fiscal Policy

**Module 3 – Demand Analysis (CO3)**

**Hours (18)**

Meaning of Demand – Law of Demand - Determinants of demand – Types of Demand – Law of diminishing marginal utility, Consumer Surplus - Elasticity of Demand. Price Elasticity, Income Elasticity, Cross Elasticity; Demand Forecasting

**Module 4 – Supply Analysis (CO4)**

**Hours (18)**

Meaning of Supply- determinants, Production function- short run production function-long run production function, Production Function Market – Managerial use of production function – Economies of Scale, Diseconomies of scale. Isoquants, and Isocost curve.

**Module 5 – Classification of Markets (CO5)**

**Hours (18)**

Meaning, features, Elements and Classification of Markets; Market structure – Profit Maximization, Price & Output Determination under Perfect Competition, Monopoly, Monopolistic Competition, and Oligopoly.

**LEARNING RESOURCES**

**Text Books**

- Alfred William Stonier and Douglas Chalmers Hague, A Text of Economic Theory, Fourth Edition, Wiley, 1972
- Dominick Salvatore (2009). Principles of Microeconomics (5th ed.) Oxford University Press.
- Gaurav Dutt & Aswani Mahajan, Dutt & Sundaram's Indian Economy – Sultan Chand & Sons.
- K.K. Dewett, Modern Economic Theory: Micro & Macro Analysis – Orient Book Distributors, New Delhi.

**References**

1. GeeksforGeeks. (2025a, April 9). *Managerial Economics : scope, nature, and importance*. GeeksforGeeks. <https://www.geeksforgeeks.org/managerial-economics-scope-nature-and-importance/>
2. Rose, D. (2025, January 17). *What is managerial economics and how can it help your business?* Pipedrive. <https://www.pipedrive.com/en/blog/managerial-economics>

**SEMESTER IV**

**BA4C05PM25 - PREDICTIVE MODELLING USING SAS**

**CREDITS: 3**

**TOTAL PRACTICAL HOURS: 90**

**COURSE OUTCOMES**

**CO1:** Apply SAS programming language techniques to perform statistical analysis (Apply)

**CO2:** Analyse datasets by exploring, filtering, formatting, and transforming data using SAS procedures (Analyse)

**CO3:** Illustrate predictive models techniques using SAS procedures (Analyse)

**CO4:** Develop data visualizations and reports using SAS plotting and reporting tools (Apply)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	2	3	1	1	2
<b>CO2</b>	2	3	1	1	1
<b>CO3</b>	2	3	1	1	2
<b>CO4</b>	1	3	1	3	1

**SLLABUS CONTENT**

**Module 1 - Introduction (CO1)**

**Hours (18)**

Introduction to SAS programming tools and the fundamentals of SAS program structure and syntax, identify the features of a SAS table, access data through SAS libraries, SAS Data set and Proc step, and import data into SAS.

**Module 2 – Exploring and Validating Data (CO2)**

**Hours (18)**

Exploring Data with SAS Procedures, Filtering Rows with the WHERE Statement, Formatting Data Values, Common Formats for Date Values, Sorting Data, Identifying and Removing Duplicates, DATA Step Processing, Numeric Functions to Create Columns, Conditional Processing with IF-THEN, Creating Character Columns with the LENGTH Statement

**Module 3 - Introduction to Predictive Modelling (CO3)**

**Hours (18)**

SAS procedures or modules, such as PROC REG, PROC LOGISTIC, PROC CLUSTER,

PROC ARIMA for linear regression, logistic regression, cluster analysis, time series forecasting. Interpreting results and making predictions.

**Module 4 – Charts and Plots and reporting in SAS (CO4)**

**Hours (18)**

Introduction to visualization, scatter plot, series plot, Bar Plot, Pie Plot, Overlaying plot. Proc print, advanced reporting with Proc tabulate

**Learning Resources**

**Textbooks**

- *Predictive Modelling with SAS Enterprise Miner: Practical Solutions for Business Applications* (2013), Second Edition, Kattamuri S. Sarma, PhD
- Bailer, A. J. (2020). *Statistical Programming in SAS*. CRC Press

**References**

1. TutorialsPoint. (2025, March 25). *SAS Tutorial*. <https://www.tutorialspoint.com/sas/index.htm>
2. *SAS Tutorial - TPoint Tech*. (n.d.). [www.tpointtech.com](http://www.tpointtech.com). <https://www.tpointtech.com/sas-tutorial>

**SEMESTER IV**

**BA4IM25 - INTERNSHIP**

**CREDITS: 4**

**TOTAL DURATION: 2 Months**

**COURSE OUTCOMES**

**CO1:** Develop hands on experience to apply theoretical knowledge in practical settings (Apply)

**CO2:** Develop predictive and descriptive models by employing statistical methods and machine learning algorithms to derive actionable insights from organizational data. (Apply)

**CO3:** Develop interactive data visualizations and dashboards using tools like Tableau and Power BI to effectively communicate key findings to stakeholders. (Apply)

**CO4:** Illustrate critical thinking and problem-solving abilities by integrating analytical results into strategic recommendations aligned with organizational goals (Apply)

**Mapping of Course Outcomes with Programme Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	2	2	2	3
<b>CO2</b>	3	2	2	2	3
<b>CO3</b>	2	3	2	2	2
<b>CO4</b>	1	2	2	2	3

During the IV semester, the students are required to undergo an internship for a period of two month in any company for gaining practical experience in the field. A viva will be conducted at the end of the fourth semester by an external examiner to assess the level of practical knowledge and experience acquired by the students.

## **SYLLABI FOR ELECTIVE COURSES**

**SEMESTER IV**

**BA4E01TM25 - MARKETING MANAGEMENT**

**CREDITS: 3**

**TOTAL LECTURE HOURS: 72**

**COURSE OUTCOMES**

**CO1:** Explain the concept of Marketing and its importance in contemporary context. (Understand)

**CO2:** Apply the concept of Segmentation, Targeting and Positioning in real life marketing scenarios. (Apply)

**CO3:** Develop Product, Price, Place and Promotion strategies for brands. (Apply)

**CO4:** Examine the role of digital marketing as a contemporary marketing tool with analytical concepts. (Apply)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	2	1	2	1	3
<b>CO2</b>	3	1	2	3	3
<b>CO3</b>	2	1	2	3	3
<b>CO4</b>	2	1	2	3	3

**SYLLABUS CONTENT**

**Module 1 - Introduction To Marketing (CO1) Hours (18)**

Defining Marketing in the contemporary context – Core Marketing concepts – Emerging Paradigms in Marketing – Understanding Consumer and Business Markets – Consumer Buying Behaviour – Analysing Business Markets – Types of consumer and business buying - Consumer Needs, Wants Marketing Insights – Marketing Intelligence systems

**Module 2 - Marketing Strategies and Plans (CO2) Hours (18)**

Segmentation – Bases – Market targeting – Developing Positioning – Differentiation – Concept of Unique Selling Propositions

**Module 3 - Marketing Mix (CO3) Hours (18)**

Product and Services – Service characteristics - New Product Development – Product Life cycle, Pricing – Factors and Strategies – Channels – Channel functions and levels – Marketing communications mix – Push and Pull strategies – Ethical issues in Promotion

**Module 4- Digital Marketing Analytics (CO4)**

**Hours (18)**

Introduction to digital marketing channels, Overview of digital marketing analytics tools, Tracking and analyzing website traffic and engagement, Search engine optimization (SEO) analytics, Pay-per-click (PPC) advertising analytics, Social media analytics, E mail marketing analytics, Mobile app analytics, Digital campaign measurement and optimization, Attribution modeling in digital marketing analytics, Gamification and the Fun Theory - Principles of Gamification - Gamification in Business. Case studies and examples of digital marketing analytics, Emerging trends in digital marketing analytics.

**LEARNING RESOURCES**

**Textbook**

- Kotler, Philip and Armstrong. (2007). *Principles of Marketing*. (12thed.). New York:Pearson Education.

**References**

1. Ramaswamy and Namakumari. (2005). *Marketing Management*. Macmillan.
2. Arun Kumar and Meenakshi. (2007). *Marketing Management*. Vikas.
3. Lamb, Hair and Daniel. M. C. (2004). *Marketing*. (7thed.). Thomson
4. Evans and Berman. (2005). *Marketing*. (2nded.). Biztantra
5. William M Pride and O C Ferrell. (2005). *Marketing – Concepts* (12th ed.). Cengage Learning

**SEMESTER IV**

**BA4E02TM25 - SUPPLY CHAIN MANAGEMENT**

**CREDITS: 3**

**TOTAL LECTURE HOURS: 72**

**COURSE OUTCOMES**

**CO1:** Illustrate fundamental supply chain management principles and their strategic significance in business (Apply)

**CO2:** Evaluate various supply chain models, risk factors, and performance metrics in different industries (Evaluate)

**CO3:** Analyse the role of analytics in optimizing supply chain operations, including forecasting, demand planning, and network design (Analyse)

**CO4:** Interpret emerging trends and technologies shaping the future of supply chain management, such as sustainability and digital transformation (Apply)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	2	1	3	1	3
<b>CO2</b>	2	1	3	1	1
<b>CO3</b>	2	1	3	1	1
<b>CO4</b>	2	1	3	1	3

**SYLLABUS CONTENT**

**Module 1: Foundations of Supply Chain Management (CO1) Hours (18)**

Introduction to Supply Chain Management (SCM), Key Components of a Supply Chain: Suppliers, Manufacturers, Distributors, Retailers, Customers; Supply Chain Strategies and Competitive Advantage; Demand and Supply Planning Theories; Bullwhip Effect and its Implications

**Module 2: Supply Chain Risk & Performance Evaluation (CO2) Hours (18)**

Risk Management in Supply Chains, Resilient and Agile Supply Chain Strategies, Key Performance Indicators (KPIs) in SCM, Supplier Relationship Management and Procurement Strategies; Inventory Management Theories (EOQ, JIT, Safety Stock)

**Module 3: Supply Chain Analytics & Decision-Making (CO3)**

**Hours (18)**

Role of Business Analytics in Supply Chain Management, Demand Forecasting and Sales Prediction Techniques, Logistics and Transportation Planning, Supply Chain Network Design and Optimization, Cost-Benefit Analysis in SCM

**Module 4: Emerging Trends & Future of Supply Chain (CO4)**

**Hours (18)**

Digital Transformation in Supply Chains (AI, IoT, Blockchain), Sustainable and Green Supply Chains, Circular Economy and Reverse Logistics, Ethical and Regulatory Considerations in SCM, Case Studies on Global Supply Chain Disruptions.

**LEARNING RESOURCES**

**Text Books:**

- Chopra, S., & Meindl, P. – *Supply Chain Management: Strategy, Planning, and Operation*
- Simchi-Levi, D., Kaminsky, P., & Simchi-Levi, E. – *Designing and Managing the Supply Chain*
- Christopher, M. – *Logistics & Supply Chain Management*
- Tang, C. S. – *Supply Chain Risk Management*

**References**

1. Harvard Business Review Articles on Supply Chain Analytics
2. McKinsey & Co. Reports on Digital Supply Chains

**SEMESTER IV**

**BA4E03TM25 - HUMAN RESOURCE MANAGEMENT**

**CREDITS: 3**

**TOTAL LECTURE HOURS: 72**

**COURSE OUTCOMES**

**CO1:** Justify current Human Resource Practices in organizations (Evaluate)

**CO2:** Explain the necessity of operational organizational practices and emergent market trends (Understand)

**CO3:** Illustrate, align, and appraise Employee Performance (Analyse)

**CO4:** Assess the potential applications of workplace analytics in improving efficiency and decision-making. (Evaluate)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	1	1	2	1	3
<b>CO2</b>	1	1	2	1	3
<b>CO3</b>	1	1	2	1	3
<b>CO4</b>	1	1	2	1	3

**SYLLABUS CONTENT**

**Module 1 - Introduction to HRM and HR Planning (CO1) Hours (18)**

Meaning, Objectives and Importance of HRM - Functions, Nature and Scope of HRM Evolution and HR Models - Job Role of an HR - Context and Environmental Scanning – Meaning - Nature and Importance of HRP - Benefits and Barriers of HRP Planning Process - - Job Design and Evaluation - Recruitment and Selection Meaning, Nature, Importance and Process - Case Study

**Module 2 - HR Operations and Emerging Trends (CO2) Hours (18)**

Induction - Meaning, Purpose, Requisites, and Evaluation of Induction - Training and Development, Training Needs Analysis, Mentoring, MDPs and other Techniques, On and Off the Job Training - Career Development and Talent Management - Performance Management and Compensation - Incentives and Performance-Based Pay

**Module 3 - Performance Appraisal (CO3) Hours (18)**

Meaning, Nature and Objectives - Performance Appraisal and Competitive Advantage; Performance Appraisal Process; Rating and Raters - Meaning and Problems- Philips Model and

Appraisal - 360-degree appraisal and Performance Evaluation; Challenges of Performance Appraisal

**Module 4 - People Analytics (CO4)**

**Hours (18)**

International HRM, Emerging Trends - Creativity & Innovation, Quality of Work Life, Flexi-Work, Work-from-Home and Shared Workspace – Contemporary Challenges in HRM - Employee Engagement, Attrition, Diversity and Inclusion, HR Analytics - Overview, –Case Study.

**LEARNING RESOURCES**

**Textbooks**

- Gary Dessler & Biju Varkkey, Human Resource Management, Pearson Education
- VSP Rao, Human Resource Management: Text and cases, Excel Books, New Delhi
- Mizra S. Saiyadain, Human Resources Management, 4th Ed, Tata McGraw Hill
- K. Aswathappa, Human Resource & Personnel Management – Tata McGraw Hill
- Raymond Noe, Employee Training and Development, Tata McGraw Hill

**References**

1. Aswathappa. (2010). *Human Resource Management*. Tata McGraw Hill Education.
2. P. Subba Rao. (2009). *Personnel and Human Resource Management*. Himalaya Publishing House.
3. C.B.Gupta. (2014). *Human Resource Management*. Sultan chand and sons.
4. P. N. Reddy and H. R. Appannaiah. (2012). *Personnel Management*. Himalaya Publishing House.

**SEMESTER IV**

**BA4E04TM25 - ENTREPRENEURSHIP**

**TOTAL CREDITS: 3**

**TOTAL LECTURE HOURS: 72**

**COURSE OUTCOMES:**

**CO1.** Appraise the fundamentals of entrepreneurship and the nature of an entrepreneur's work (Analyse)

**CO2.** Identify and describe the components of a Business Plan (Understand)

**CO3.** Distinguish various sources of financing (Understand)

**CO4.** Distinguish between the different laws and regulations that govern entrepreneurship (Evaluate)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	1	1	2	1	3
<b>CO2</b>	1	1	2	1	3
<b>CO3</b>	1	1	2	1	3
<b>CO4</b>	1	1	2	1	3

**SYLLABUS CONTENT**

**Module 1 - Introduction to Entrepreneurship (CO1)**

**Hours (18)**

Overview of Entrepreneurship, Types of Entrepreneurs, Traits of Successful Entrepreneurs; Entrepreneurship Development Programmes (EDP), Objectives of Entrepreneurship Development Programmes, Criteria for the Evaluation of EDPs ; India's Start Up revolution; Social Entrepreneurship & Entrepreneurship– differences, Case discussions on Entrepreneurs.

**Module 2 - Business Model development (CO2)**

**Hours (18)**

Forming a Business-Structure & Forms of Ownership, Business Model Development; Creating a Business Plan- Market Size Analysis, Marketing Plan, Operational Plan, Financial Plan.

**Module 3 - Financing the Business (CO3)**

**Hours (18)**

Stages in Business; Sources of Finance –Debt Financing & Equity Financing; Valuation techniques – Financial Management for Entrepreneurs

**Module 4 - Scaling Up the Business (CO4)**

**Hours (18)**

Innovation and Entrepreneurship- Managing the Innovation Process; Regulations and Laws governing entrepreneurship – IPR; Strategies for Scaling up the business- Organic and Inorganic Growth, Growing the business across geographical borders-Case Discussions

**LEARNING RESOURCES**

**Text books**

- Hatten, T.S. (2011). *Small Business Management: Entrepreneurship and Beyond*, Cengage Learning.
- Hisrich, R. D., Peters, M. P., Manimala, M. and Shepherd, D.A. (2015). *Entrepreneurship*. McGraw Hill Education.

**References**

1. Bansal, Rashmi. (2012). *Connect the Dots*. New Delhi: Westland.
2. Bansal, Rashmi. (2012). *Stay Hungry, Stay Foolish*. New Delhi: Westland.
3. Bohoney, Jason. (2011). *The Entrepreneurship Toolkit: Successful Approaches to Fostering Entrepreneurship*. Washington: Weidemann Associates Inc.

**SEMESTER IV**

**BA4E05TM25 - STRATEGIC MANAGEMENT**

**CREDITS: 3**

**TOTAL LECTURE HOURS: 72**

**COURSE OUTCOMES**

**CO1:** Explain the various perspectives and concepts in the field of Strategic Management (Understand)

**CO2:** Examine the impact of strategy on business environment (Apply)

**CO3:** Appraise business strategies specific to organisational levels & to develop skills for applying Strategic Management concepts to the solution of business problems (Analyse)

**CO4:** Determine different strategic framework for business situations (Apply)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	1	1	2	1	3
<b>CO2</b>	1	1	2	1	3
<b>CO3</b>	1	1	2	1	3
<b>CO4</b>	1	1	2	1	3

**SYLLABUS CONTENT**

**Module 1 - Introduction to Strategic Management (CO1) Hours (18)**

Introduction to Strategic Management – Concept of Strategy -Strategic Management Process – Vision & Mission – Characteristics of good mission statements - Objectives and Goals – 7S Framework - Challenges to Strategic Management – Levels of Business Strategy Corporate-Level Strategies - Business-Level Strategies- Functional Strategies

**Module 2 – Strategy and the Business Environment (CO2) Hours (18)**

Environmental scanning & Industry Analysis & Diagnosis: Analysis of company's external environment -Porter's 5 Forces model; Internal analysis: Importance of organisation's capabilities, competitive advantage and core competence, Michael E. Porter's Value Chain Analysis

**Module 3 – Strategic Business Models (CO3)**

**Hours (18)**

Strategic Formulation, Strategic gap analyses, portfolio analyses – BCG matrix. Strategy Implementation - Strategy Evaluation & Control

**Module 4 - Strategic framework (CO4)**

**Hours (18)**

Corporate Social Responsibility – Sustainability and Strategic Management – Integrating Social & Environmental Sustainability issues in Strategic Management - Recent Developments in Strategic Management Core Competence as the Root of Competitive Advantage

**LEARNING RESOURCES**

**Text Books**

- Hill, Charles W.L. and R. Jones, Gareth – Strategic management: An integrated Approach, Cengage
- Azhar Kazmi, Strategic Management – Tata McGraw Hill
- Srinivasan R – Strategic Management: The Indian Context, Prentice Hall of India
- Srivastava RM – Strategic Management: Concepts, Skills and Practices, Prentice Hall of India.
- Mason Carpenter, Gerard Sanders, Prashant Salwan – Concepts and Cases Strategic Management: A Dynamic Perspective, Pearson Education, India

**References**

1. J.A. Pearce & R.B. Robinson: Strategic Management formulation implementation and control, TMH
2. Arthur A. Thompson Jr. A.J Strickland III: Crafting and executing strategy, TMH
3. Gerry Johnson & Kevan Scholes, Exploring corporate strategies, PHI
4. Upendra Kachru: Strategic Management, Excel books
5. Arthur A. Thompson Jr. and A.J. Strickland: Strategic Management – Concepts and Cases, McGraw-Hill Companies
6. Lawrence R. Jauch & William F. Glueck: Business Policy and Strategic Management (Mcgraw Hill Series in Management).

**SEMESTER IV**

**BA4E06TM25 - INTERNATIONAL BUSINESS**

**CREDITS: 3**

**TOTAL LECTURE HOURS: 72**

**COURSE OUTCOMES**

**CO1:** Discuss the environment of international trade and the theories that govern it. (Understand)

**CO2:** Explain the forms of multinational enterprise & various market entry strategies (Apply)

**CO3:** Explain the role of international organisations in economic integration and the emerging trends and developments in International Business. (Apply)

**CO4:** Examine the foreign exchange market mechanism and related concepts. (Apply)

**Mapping of Course Outcomes with Program Specific Outcomes**

<b>Mapping</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	1	1	2	2	3
<b>CO2</b>	1	1	2	2	3
<b>CO3</b>	2	1	2	2	3
<b>CO4</b>	2	1	2	2	3

**SYLLABUS CONTENT**

**Module 1 - Introduction to International Business Environment (CO1) Hours (18)**

Nature and scope of International Business Environment, Global Business environment Social, Economic, Political and Ecological factors Theories of International Trade: Ricardo's Theory, Heckscher-Ohlin Theory. Electronic Commerce – Cross Border Transactions – On-line Financial Transfers

**Module 2 - Multinational Enterprises and its legal, regulatory framework concerning global business operations. (CO2) Hours (18)**

Introduction to the concept of Multinational Enterprises, Meaning of International Corporations, Role and importance of Multi-national corporations in international business, Market Entry Mode, Strategies, International Strategic Alliances, Cross-border Integration & Coordination. Legal Framework Relating to: International Licensing; Franchising; Joint Ventures, Patents and trademarks; Technology transfer, Telecommunications. Legal Framework relating to Electronic Commerce – Intellectual Property Rights.

**Module 3 - Trading environment of international trade and Emerging Developments in International Business (CO3) Hours (18)**

Free trade vs protection – Tariff and Non tariff barriers – Trade blocks - Evolution, structure and functions of: NAFTA , (SAARC), European Union (E.U.), World Trade Organization (WTO). International Marketing through Internet; Ecological concerns and international marketing ethics, Latest trends in International Business. Growing Emerging Markets, Demographic Shifts, Increased Competition, Slower Growth, Clean Technology, Innovation with external and internal focus, Sales growth predicted to be largely in emerging markets – Case studies

**Module IV - Foreign Exchange Market (CO4) Hours (18)**

Introduction to Foreign Exchange Market, Meaning of Exchange Rate, Determination of Exchange rate – Fixed, Flexible and Managed, Implications of Foreign Exchange Market on International business, Foreign Exchange transaction mechanism (Option – forward contract – arbitrage – hedging and swaps), Pricing pattern, Trade, PPP, IRP, IFE, Portfolio, Balance, Demand and Supply Growth, BOP Monetary Approach, Management of foreign Exchange with special reference to India.

**LEARNING RESOURCES**

**Text Books**

- Charles Hill, Arun Kumar Jain, International Business– Competing in the Global Market Place, Sixth Edition, Tata McGraw Hill, 2008
- Miltiades Chacholiades, International Economics, Mc-Grew Hill Publishing Co, New York. 1990
- W. Charles Sawyer and Richard L. Sprinkle, International Economics, Third Edition, Prentice Hall. 2009

**References**

1. *international business examples to learn from.* (2021, June 29). Business Insights Blog. <https://online.hbs.edu/blog/post/international-business-examples>
2. GeeksforGeeks. (2023, April 26). *International Business: Meaning, reason, scope, and benefits.* GeeksforGeeks. <https://www.geeksforgeeks.org/international-business-meaning-reason-scope-and-benefits/>
3. *International business.* (2025, March 3). HBR. <https://hbr.org/topic/subject/international-business>.

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