University of Engineering and Management
Institute of Engineering & Management, Salt Lake Campus
Institute of Engineering & Management, New Town Campus
University of Engineering & Management, Jaipur

5th Semester Syllabus for BBA in Business Analytics
Admission Batch 2022

Sl.	Subject Type	Code	Subject Name	Credit/Point/Number
9.		IFC	Industry & Foreign Certification (IFC)	At least 3 certificates need to be earned in each semester. Total min 15 certificates required in 3 years program
10.		MAR581	Mandatory Additional Requirements (MAR)	As per University norms

BBA BA 3rd Year Course Structure: 2022-2025 session – 5th Semester

3 years Programme

(Under the Maulana Abul Kalam Azad University and Technology)

Sl.	Subject Type	Code	Subject Name	Credits			Total Credits
				L	T	P	
1.	CC	BBABB501	Strategic Management	3	1	0	4
2.	C	BBABB502	Data Analytics Skills for Managers	2	0	0	2
		BBABB581	Data Analytics Skills for Managers-Practical	0	0	2	2
3.	Major	BBABA503	Advanced Programming in Python	3	1	0	4
		BBABA591	Advanced Programming in Python-Practical	0	0	2	2
4.	Major	BBABA504	Data Visualization	3	1	0	4
		BBABA592	Data Visualization-Practical	0	0	2	2
5.	Major	BBABA505	Business Forecasting Techniques	5	1	0	6
6.	**IVAMNCC**	BBA(GS)501	General Studies & Current Affairs - V	2	0	0	2
7.	**IVAMNCC**	BBA(GS)581	Competitive Aptitude Training - V	2	0	0	1
8.	**IVAMNCC**	BBABB582	Project on AI/ML/IOT/Block chain	0	0	2	1
11.	**MOOCs 5**	MOOCs	At least 1 MOOCs course from Swayam Platform	15 credits need to be earned in 3 years program			

Subject Name: Strategic Management **Credit: 4** **Lecture Hours: 40**

Subject Code: BBABB501

Study Material **MIT Open courseware** **NPTEL** **LinkedIn Learning**

COURSE OBJECTIVES:

1. To enable the students to understand the fundamental concept of strategy in business.
2. To enable the students to understand the fundamental techniques of formulating strategy.
3. To enable the students to understand the relevance of strategy to sustain in a competitive scenario.
4. To understand the logic of designing an effective strategy for effective growth of a corporate.

COURSE OUTCOMES:

1: Students can examine the fundamentals of strategic issues of business.

2: Students can assess the various techniques of business.

3: Students can analyze the importance and logic of formulation of the business strategy.

4: Students can apply and implement strategy in corporate for business growth.

Module number	Topic	Sub-topics	Text Book as per Syllabus	Mapping with Industryand International Academia	Lecture Hours	Corresponding Lab/Case Study Assignment
1	**Introduction, Strategic Intent-Vision, Mission & Objectives (VMO)**	• Definition and meaning of strategy & strategic management; Objectives & role of strategic management. • Benefits and importance of strategic management; Causes for failure of strategic management; the strategic management process. • Vision – concept & importance; Mission – concept & relevance; Objectives & goals – concept & relevance; Components of mission statement, • Formulation of mission & objectives and their specificity; Examples of VMO.	Strategic Management Azhar Kazmi, Adela Kazmi McGrawHill. Chapter – 1	***International Academia:*** **MIT Open Course: https://ocw.mit.edu/courses/15-902-strategic-management-i-fall-2006/** ***Industry Mapping: Industry Lecture***	12	Case study on "Establishing the Strategic Intent at Dabur India Limited"
2	**Environmental Analysis**	• Concept of environment, environmental analysis and appraisal, • Need for & component of external environment analysis; • Tools & techniques of environment analysis – PESTEL, ETOP; Porter's Five Forces Model • Concept of Internal analysis; Value chain analysis; Factors of internal analysis;	Strategic Management Azhar Kazmi, Adela Kazmi McGrawHill. Chapter - 3	***International Academia:*** **MIT Open Course: https://ocw.mit.edu/courses/15-902-strategic-management-i-fall-2006/**	11	Case study on "The Ecosystem for the Retailing Industry in India"

		• Strategic & Situational Analysis – SWOT Analysis, TOWS Matrix		***Industry Mapping:***		
3	**Strategic Planning**	• Meaning & Stages of Strategic Planning; Corporate goal setting, functional goal setting, managerial goal setting, positioning organization • Strategy Formulation I - Corporate level strategies: Concept, scope, types and significance of corporate level strategies; Generic Growth/expansion strategies - characteristics, forms, applicability; Ansoff matrix • Strategy Formulation II - Business level strategies: Concept of business level strategies; Competitive advantage and Core competencies; Cost leadership, differentiation & focus; Porter's framework of competitive strategies; Concept of SBU	Strategic Management Azhar Kazmi, Adela Kazmi McGrawHill. Chapter – 5, 7(7.1, 7.2, 7.3)	***International Standards:*** **MIT Open Course: https://ocw.mit.edu/courses/15-902-strategic-management-i-fall-2006/** ***Industry Mapping:***	12	***"Campaign Design- Green Walk"***
4	**Strategic Analysis, Choice and Implementation**	• Concept of strategic analysis and choice; BCG Matrix & GE-Nine Cell Planning grid. • Issues in strategy implementation, Integrating the functional plan and policies; Role of managers, Leadership, strategic control system & measurement; • Strategic Actions - Mergers, Acquisitions & Diversification	Strategic Management Azhar Kazmi, Adela Kazmi McGrawHill. Chapter – 5, 8(8.1, 8.3, 8.3), 14	***International Standards:*** **MIT Open Course: https://ocw.mit.edu/courses/15-902-strategic-management-i-fall-2006/** ***Industry Mapping:***	15	Customer satisfaction survey: Questionnaire design.

**Submitted by Dr. Soumik Gangopadhyay, Dr. Sweta Kishore IEM Saltlake campus*

TEXTBOOK:

1. Strategic Management Azhar Kazmi, Adela Kazmi McGrawHill.

Reference Book:

1. Strategic Management Theory & Cases. An Integrated Approach Charles W.L. Hill/ Melissa A. Schilling, Gareth Jones, Cengage.

Subject Name: Data Analytics Skills for Managers Credit: 4 Lecture Hours: 40

Subject Code: BBABB502

Pre-requisite: Basic knowledge of Mathematics and Statistics

Relevant Links:

Study Material Coursera NPTEL LinkedIn Learning MIT Opencourseware

COURSE OBJECTIVES:

1. To enable the students to understand fundamental concepts, terms and terminologies involved in data analytics, and to relate themselves with importance, role and application of data analytics in business domain.

2. To help the students understand data collection and data pre-preprocessing strategies through the incorporation of case studies.

3. To enable students to identify three core types data analytical techniques i.e. exploratory, descriptive, and causal along with its nature and application.

4. To enable the students classify the application of appropriate analytical techniques in appropriate situation.

COURSE OUTCOMES:

CO1: Students will learn the basic & fundamental concepts of Data Analytics and its applications in different domains of business.

CO2: Students will be able to understand the intricacies of Data Analytics such ashow it works, different statistical methods of Data Analytics, identify three core types of data analytical techniques i.e. exploratory, descriptive, and causal along with their application, how to deal with the critical issues related to data.

CO3: Students will be able to apply their knowledge of Data Analytics in dealing with the contemporary real world business problems effectively.

CO4: Students will be able to analyze business problems involving Data Analytics.

CO5: Students will be able to evaluate real world data to take efficient business decisions.

CO6: Students will be able to create newer ideas while dealing with the issues of Data Analytics and will also be able to ensure their overall development.

Course content:

Module Number	Topic	Sub-topics		Mapping with Industry and International Academia	Lecture Hours	Corresponding Lab Assignment / Case-Study
M1	**Introduction to Data Analytics**	Data, Information, Knowledge, and Wisdom; Types of Data – Qualitative- Nominal-Ordinal and Quantitative- - Continuous – Discrete; Dimensions of Data Quality- Accuracy – Completeness – Consistency – Timeliness – Uniqueness – Validity; Data Science; Big Data –Sources, Types of Big Data–Structured – Unstructured – Semi-structured – Metadata; Characteristics of Big Data –	Big Data Fundamentals Concepts Drivers and Techniques: Thomas Erl, WajidKhattak and Paul Buhler- Prentice Hall Chapter 1	International Academia: https://ocw.mit.edu/courses/24-910-topics-in-linguistic-theory-laboratory-phonology-spring-2007/resources/lec9_1_stats/	10	1. Assignments on real life data processing. 2. Assignments on Big data. 3. Assignments on application of data analytics in business.

		Volume – Velocity – Variety – Veracity – Value; Data Analytics – Descriptive – Diagnostic – Predictive – Prescriptive; Applications of Data Analytics in Business – Production and Inventory Management – Sales and Operations Management – Finance and Investment – Marketing Research –Human Resource Management.				
M2	**Descriptive Statistics**	Measures of Central Tendency, Measures of Dispersion, Skewness and Kurtosis	STATISTICAL METHODS - N G Das - McGraw Hill Education Chapters 5,6.7	International Academia: https://ocw.mit.edu/courses/15-310-managerial-psychology-laboratory-spring-2003/resources/recitation08april1103simplestatistics1/	10	1. Assignments on central tendency 2. Assignments on dispersion
M3	**Basic Analysis Techniques**	Statistical hypothesis generation and testing, t-test and z test	Statistical Techniques in Business & Economics - Douglas A. Lind, William G. Marchal, Samuel A. Wathen –	International Academia: https://ocw.mit.edu/courses/6-780-semiconductor-manufacturing-spring-2003/resources/ln2estimation/	10	1. Assignments on hypothesis formation 2. Assignments on z test and chi-square test 3. Application of statistical hypothesis in framing business decisions.

			McGraw Hill Education Chapter 10			
M4	**Data Analysis Techniques**	Correlation and Regression Analysis	STATISTICAL METHODS - N G Das - McGraw Hill Education Chapter 9	International Academia: https://ocw.mit.edu/courses/18-s096-topics-in-mathematics-with-applications-in-finance-fall-2013/resources/mit18_s096f13_lecnote6/	10	1. Assignments on regression 2. Numericals on correlation and covariance calculation

TEXTBOOK:

1. STATISTICAL METHODS - N G Das - McGraw Hill Education
2. Statistical Techniques in Business & Economics - Douglas A. Lind, William G. Marchal, Samuel A. Wathen – McGraw Hill Education

REFERENCEBOOKS:

1. Big Data Fundamentals Concepts Drivers and Techniques: Thomas Erl, Wajid Khattak and Paul Buhler- Prentice Hall

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
BBABB502.1	3	3	3			3	2	
BBABB502.2	3	3	3			3	2	

BBABB502.3	3	3	3			3	3	
BBABB502.4	3	3	3			3	3	
BBABB502.5	3	2	3			3	3	
BBABB502.6	2	2	3			3	3	

3= Strong 2=Average 1=Weak (Kindly mention the Number only)

PO & PI Mapping:

PO1: Assessment of Choices Students will develop the capability to assess alternate managerial choices and come up with optimal solutions.	
Competency	**Indicators**
1.1 Demonstrate competencies in Business Construction Model & Decision- Making Model 1.2 Demonstrate competencies in evaluation of each of the alternatives	1.1.1. Ability to take up analytical approach for problem solving, 1.1.2. ability to take into consideration minute details and factors that influences a business. 1.2.1 Ability to weigh the pros and cons of each of the alternatives or options available to a functional area of a business.
PO 2 : Identification of the Nature of a Problem Area Students will be able to apply their conceptual understanding of marketing, finance and human resources in the real world.	
Competency	**Indicators**
2.1. Demonstrate an ability to identify an area that requires problem solving. 2.2 Demonstrate an ability to assess the business environment and understand their impact on the business.	2.1.1 Ability to contribute towards problem solving methods, 2.1.2 Understanding a problem or issue belongs to which of the specialized areas of data analytics- Descriptive, Diagnostic, Predictive and Prescriptive. 2.2.1 To be able to identify the different factors that influences the business.
PO 3: Decision Making Skills: Students will develop decision making skills with the help of analytical and critical thinking ability.	
Competency	**Indicators**
3.1 To be able to demonstrate the different aspects that can get influenced by the decision taken within the business.	3.1.1 Capability of suggesting a decision after proper assessment
3.2 To be able to demonstrate the optimal solution or close to an optimal solution to a given managerial problem.	3.2.1 Reaching to a solution and evaluating it after observing the changes (Case study method can be implemented)

PO6: Integration of Functions: Students will be able to integrate functional areas of management for planning, implementation and control of business decisions.	
Competency	**Indicators**
6.1 Demonstration of the ability to identify gaps in a business strategy, and to be able to close these gaps. 6.2 Demonstrate the identification of changing trends in a business and operation of the functional areas accordingly.	6.1.1. Continuation of Professional development and observation skills, 6.1.2. Using rational approach towards an issue. 6.2.1. Ability to study the changes in preferences of customers.
PO 7: Deployable Skill set: Students will develop deployable skills parallel to the chosen functional/ specialized area	
Competency	**Indicators**
7.1 Demonstrating the ability to identify the nature of a problem appearing during the course of business.	7.1.1 Acknowledgement of the existence of a problem
7.2 Demonstrating the ability to apply the learned skill set as when required	7.1.2. Ability to implement the required knowhow as when necessity arises.

Subject Name: Advanced Programming in Python **Lecture Hours: 72**

Subject Code: BBABA503 **Credit: 6**

Relevant Links:

Study material Advanced Programming in python.pdf

https://www.coursera.org/learn/programming-in-python

COURSE OBJECTIVES:

1. The students will gain in-depth knowledge about changing business environments across different industries.
2. Students will be able to handle different tools of decision making and problem-solving methods in the context of commercial organization.
3. Students will be industry ready by using different techniques of problem-solving approach of commercial organization.
4. Students will be able to assess the relevance of investment in several domain areas of business.

CO	Details
1	Students will be able to connect different concepts of marketing, human resources and finance in business
2	Students will be able to understand the optimum value of utilizing non-monetary resources to achieve prosperity of an organization.
3	Students will be able to assess the role and value of several functional areas of an organization for enhancing efficiency.
4	Students will be able to understand qualitative perspectives of coordination and cooperation to build an effective team.

Module number	Topic	Sub-topics	Text book as per syllabus	Mapping with Industry and International Academia	Lecture Hours	Corresponding Lab Assignment

1	Introduction to programming language:	Introduction • Relationship between computers and Programs • Basic principles of computers • File systems • Using the Python interpreter • Introduction to binary computation • Input / Output	Atanu Das , Rajkumar Patra - Python Programming for Computer Science and Application	International Academia: **https://ocw.mit.edu/courses/6-0001-introduction-to-computer-science-and-programming-in-python-fall-2016/** **Industry Mapping:** Creating the fundamental knowledge of programming	18	Arithmetic operations, built in operations
2	Data Types and Control Structures	• **Data types and control structures** • **Operators (unary, arithmetic, etc.)** • **Data types, variables, expressions, and Statements Assignment statements** • **Strings and string operations** • **Control Structures: loops and decision**	Atanu Das , Rajkumar Patra - Python Programming for Computer Science and Application	International Academia: https://ocw.mit.edu/courses/6-0001-introduction-to-computer-science-and-programming-in-python-fall-2016/ **Industrial Mapping : Introducing the knowledge of making a model using python**	18	Loops, data types, strings

3	**Classes**	**Modularization and Classes** • Standard modules • Packages • Defining Classes • Defining functions • Functions and arguments (signature)	Atanu Das , Rajkumar Patra - Python Programming for Computer Science and Application	International Academia: https://ocw.mit.edu/courses/6-0001-introduction-to-computer-science-and-programming-in-python-fall-2016/ **Industrial Mapping :** Package mostly used in the industries for machine learning models	18	Classes objects, built in modules
4	**Exception Handling & Object Oriented Design**	**Exceptions and data structures** • Data Structures (array, List, Dictionary) • Error processing • Exception Raising and Handling • Object oriented design • Programming types • Object Oriented Programming • Object Oriented Design • Inheritance and Polymorphism	Atanu Das , Rajkumar Patra - Python Programming for Computer Science and Application	International Academia: https://ocw.mit.edu/courses/6-0001-introduction-to-computer-science-and-programming-in-python-fall-2016/ **Industrial Mapping : How to handle errors and how to design a model**	18	Constructors, inheritance

Text Book:

Atanu Das, Rajkumar Patra - Python Programming for Computer Science and Application

Subject Name: Data Visualization **Lecture Hours: 72**

Subject Code: BBABA504 **Credit: 6**

Relevant Links:

Study material Data Visualization.pdf

https://www.coursera.org/learn/python-for-data-visualization

CO	Details
1	Students will apply visualization tools in corporates
2	Students will know the history of data visualization and its connection with computer graphics
3	Students will be able to understand various types of data types
4	Students can examine the visualization of structured data

COURSE OBJECTIVES:

1. To enable the students to understand the fundamental concepts of visualization
2. To enable the students to understand the fundamental concepts of visualization tools in business analytics
3. To enable the students to understand the relevance of data visualization in commercial Organization.
4. To understand the logic of designing an effective visualization dashboard in a corporate..

Text Book:

Sharada Singeswara, Tiwari, U. Dinesh Kumar- Data Visualization: Storytelling using data

Module number	Topic	Sub-topics	Text Book as per Syllabus	Mapping with Industry and International Academia	Lecture Hours	Corresponding Lab Assignment
1	**Introduction to Data Visualization**	• Introduction • What is Data visualization? • Why do we have to visualize data? • How do we visualize? • Seven stages of visualizing data • Usage of visualization • Types of charts • Common chart selection questions-- • Introduction to binary computation • Input / Output	Sharada Singeswara, Tiwari, U. Dinesh Kumar- Data Visualization: Storytelling using data	***International Academia:*** https://ocw.mit.edu/courses/res-6-009-how-to-process-analyze-and-visualize-data-january-iap-2012/ ***Industry Mapping:*** Power BI, excel and python for visualization	18	1. Finding Data to Support Research. 2. Creating a Data Management Plan.
2	**Visualization Practices**	• Importance of data visualization • Data types • effectiveness of visual encodings • color • Edward Tufte's Design principles • Can chart junk be useful?	Sharada Singeswara, Tiwari, U. Dinesh Kumar- Data Visualization: Storytellin	**International Standards** : https://ocw.mit.edu/courses/res-6-009-how-to-process-analyze-and-visualize-data-january-iap-2012 ***Industry Mapping:*** Power BI, excel and python for visualization	18	1. Python Basics.

			g using data			
3	**Visualization of Structured data**	• Exploratory analysis • Modelling • Visualization during deployment • Business operation dashboard	Sharada Singeswara, Tiwari, U. Dinesh Kumar- Data Visualization: Storytelling using data	**International Standards** : https://ocw.mit.edu/courses/res-6-009-how-to-process-analyze-and-visualize-data-january-iap-2012/ ***Industry Mapping:*** Power BI, excel and python for visualization	18	1. Python for Summary Statistics.
4	**Visualization of Unstructured data**	• Importance of text data visualization • Challenges of text data visualization • Various form of text data • Text data pre-processing pipeline • Visualization text data	Sharada Singeswara, Tiwari, U. Dinesh Kumar-	**International Standards** : https://ocw.mit.edu/courses/res-6-009-how-to-process-analyze-and-visualize-data-january-iap-2012/	10	Visualization with Tableau.

		• Visualizing conversations	Data Visualization: Storytelling using data	***Industry Mapping:*** Power BI, excel and python for visualization		
5	**Storytelling**	• Why storytelling matters? • Science behind storytelling • Presentation types • Storytelling frameworks • Data storytelling • Analytics board	Sharada Singeswara, Tiwari, U. Dinesh Kumar- Data Visualization: Storytelling using data	**International Standards** : https://ocw.mit.edu/courses/res-6-009-how-to-process-analyze-and-visualize-data-january-iap-2012/ ***Industry Mapping:*** Power BI, excel and python for visualization	8	Cleaning, Sorting, and Visualizing Data.

Subject Name: Business Forecasting Techniques Credit: 6 Lecture Hours: 60

Subject Code: BBABA506

Pre-requisite: Basic Mathematics and Statistics

Relevant Links:

Study Material Coursera NPTEL LinkedIn Learning

COURSEOBJECTIVES:

1. To enable the students to understand the fundamental concepts of forecasting.

2. To enable the students to understand the methods of forecasting in predicting future demands of a product or service.

3. To enable the students to understand the strategic relevance of the different forecasting methods in commercial organization.

4. To emphasize the need for a new strategic decision-making approach within a firm based on the Business Forecasting Orientation.

COURSE OUTCOMES:

CO1: Students will learn the fundamental concepts of 'Business Forecasting'.

CO2: Students will understand the value of Business Forecasting asdecision making tools in increasing the business revenue.

CO3: Students will be able to apply the fundamentals to understand how to reach to the 'Perceived choice' – consumer's purchase decision, producer's decision.

CO4: Students will be able to analyze the underlying causes related to any changes impacting a business.

CO5: Students will be able to evaluate the impact of any strategic decision made using Business Forecasting methods.

CO6: Students will be able to prepare future strategy pertaining to a product and its market.

Module Number	Topic	Sub-topics	Text Book as per Syllabus	Mapping with Industry and International Academia	Lecture Hours	Corresponding Lab Assignment / Case-Study
1	**Fundamentals of Business Forecasting**	Introduction, Need and scope of forecasting, Time series and cross sectional data, Graphical summaries –Time plots and time series patterns, Seasonal plots, Scatter plots, Univariate statistics - MAD,MSD,	John E Hanke, Dean W Wichern: Business Forecasting, Pearson Chapter 2	International Academia: https://ocw.mit.edu/courses/18-s096-topics-in-mathematics-with-applications-in-finance-	15	1. Assignments on Capacity Planning. 2. Assignm

		Variance, Standard Deviation, Bivariate Statistics – Covariance, Correlation coefficient, Autocovariance and Autocorrelation coefficients, Measuring Forecast Accuracy – ME, MAE, MSE, MPE, MAPE.		fall-2013/pages/lecture-notes/		ents on Univariate statistics. 3. Assignments on Bivariate Statistics 4. Assignments on Autocovariance and Autocorrelation coefficients, 5. Assignments on Measuring Forecast Accuracy
2	**Time Series Smoothing Techniques**	Principle of decomposition of time series, Simple Moving Average Method, Exponential Smoothing Methods – Single Exponential Smoothing, Holt's linear methods, Holt Winters' trend and seasonality method, Exponential smoothing – Pegels' classifications	John E Hanke, Dean W Wichern: Business Forecasting, Pearson Chapter 3	International Academia: Lecture Notes & Slides | Topics in Mathematics with Applications in Finance | Mathematics | MIT OpenCourseWare	15	1. Assignments on Simple Moving Average Method 2. Assignm

						ents on Single Exponential Smoothing, 3. Assignments on Holt's linear methods, 4. Assignments on Holt Winters' trend and seasonality method.
3	**Linear Time Series Models**	Stochastic Process, Stationary Stochastic Process, Non-Stationary Stochastic Process (Random Walk), Random Walk without Drift, Random Walk with Drift, Tests for Stationarity – Box-Pierce Test, Ljung-Box Test, Unit Root Test. Simple AR Models – AR(1), AR(2), AR(p) , , Properties of AR Models- Variance, Covariances(k-lag), ACF, Stationarity, Yule-Walker equations.	Jonathan D Cryer, Kung Sik Chan: Time Series Analysis with Applications in R, Springer Chapter 4	International Academia: https://ocw.mit.edu/courses/18-s096-topics-in-mathematics-with-applications-in-finance-fall-2013/resources/mit18_s096f13_lecnote8/	15	1. Assignments on Random Walk with drift and without drift. 2. Assignments on Box-

		Simple MA Models – MA(1), MA(2), MA(q) , Properties of MA Models- Variance, Covariances(k-lag), ACF. Stationarity Dual relationship between AR(p) and MA(q) process.				Pierce Test. 3. Assignments on AR(1), AR(2), AR(p) 4. Assignments on MA(1), MA(2), MA(q)
4	**ARMA & ARIMA**	Simple ARMA Models - ARMA(p,q), Properties of ARMA(1,1) Model- Variance , Covariances(k-lag), ACF Backward shift operator, Non Seasonal ARIMA Models- ARIMA(p,d,q) Models with examples, Seasonal ARIMA Models – ARIMA(p,d,q)$(P,D,Q)_S$	Jonathan D Cryer, Kung Sik Chan: Time Series Analysis with Applications in R, Springer Chapter 4 Spyros Makridakis, Steven C. Wheelwright and Rob J Hyndman: FORECASTING METHODS AND APPLICATIONS:, Wiley India Editions. Chapter 7	International Academia: https://ocw.mit.edu/courses/18-s096-topics-in-mathematics-with-applications-in-finance-fall-2013/resources/mit18_s096f13_lecnote8/	15	1. Assignments on ARMA(p, q), Models. 2. Assignments on Non Seasonal ARIMA Models.. 3. Assignments on Seasonal ARIMA Models.

TEXTBOOK:

1. John E Hanke, Dean W Wichern: Business Forecasting, Pearson
2. Jonathan D Cryer, Kung Sik Chan: Time Series Analysis with Applications in R, Springer

REFERENCEBOOKS:

1. Spyros Makridakis, Steven C. Wheelwright and Rob J Hyndman: FORECASTING METHODS AND APPLICATIONS:, Wiley India Editions.
2. Robert S Pindyck & Daniel L Rubinfeld: ECONOMETRIC MODELS AND ECONOMIC FORECASTS, McGRAW Hill International Editions.

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
BBABA506.CO1		3	2			2	2	
BBABA506.CO2		2	3			2	3	
BBABA506.CO3		3	2			2	2	
BBABA506.CO4		3	3			3	2	
BBABA506.CO5		3	3			3	3	
BBABA506.CO6		3	3			3	3	

***3= Strong 2=Average 1=Weak**

PO & PI Mapping:

PO 2: Identification of the Nature of a Problem Area	
Competency	**Indicators**

2.1. Demonstrate an ability to identify an area that requires problem solving. 2.2 Demonstrate an ability to assess the business environment and understand their impact on the business.	2.1.1 Ability to contribute towards problem solving methods, 2.1.2 Understanding a problem or issue belongs to which of the specialized areas- Finance, HR or marketing. 2.2.1 To be able to identify the different factors that influences the business.
PO 3: Decision Making Skills	
Competency	**Indicators**
3.1. To be able to demonstrate the different aspects that can get influenced by the decision taken within the business. 3.2. To be able to demonstrate the optimal solution or close to an optimal solution to a given managerial problem.	3.1.1. Capability of implementation of a decision after proper assessment. 3.2.1 Reaching to a solution and evaluating it after observing the changes.
PO 6: **Integration of Functions**	
Competency	**Indicators**
6.1 Demonstration of the ability to identify gaps in a business strategy, and to be able to close these gaps. 6.2 Demonstrate the identification of changing trends in a business and operation of the functional areas accordingly.	6.1.1. Continuation of Professional development and observation skills, 6.1.2. Using rational approach towards an issue. 6.2.1. Ability to study the changes in preferences of customers
PO 7: **Deployable Skill set**	
Competency	**Indicators**
7.1 Demonstrating the ability to identify the nature of a problem appearing during the course of business. 7.2 Demonstrating the ability to apply the learned skill set as when required.	7.1.1 Acknowledgement of the existence of a problem, 7.1.2 Deciding the overall nature of the problem and its minor details. 7.2.1. Ability to implement the required knowhow as when necessity arises.