JINDAL GLOBAL BUSINESS SCHOOL
INDIA'S FIRST MULTI-DISCIPLINARY GLOBAL BUSINESS SCHOOL

O.P. Jindal Global University
A Private University Promoting Public Service
NAAC Accreditation - 'A' Grade

Jindal Global Business School
Course Outline

Course Title	Business Forecasting: Principles and Practice
Core or Elective	Elective
Program and Batch	BBA-3, BBA-BA-3, BBA-FB-3, BBA-FM-3
Semester & Academic Year	Spring 2026
Credits	3
Discipline/Area	IS and Analytics
Name of the Faculty Member/Course Instructor	Mashkoor Ali
Contact Details of the Faculty Member	mashkoor.ali@jgu.edu.in
Contact Details of Support Staff	jgbs-eo@jgu.edu.in
Faculty Member's Open Office Day/s & Time	TBD

Introduction to the Course

This introductory course, "Business Forecasting: Principles and Practice," equips students to apply statistical and mathematical tools to analyse data, forecast, and interpret results using Python. Students will learn to represent data in various forms and interpret outcomes directly. Designed for those with some technical competencies, the course goes beyond a "cookbook" approach, focusing on routine presentation and analysis to deepen understanding of professional topics.

Course Learning Objectives

At the end of the course, students should be able to

1. CLO1- Understand the concept and importance of Business Forecasting.
2. CLO2- Learn about different methods used for Business Forecasting.
3. CLO3- Understand the use of methods with respect to problem definition and analyse them.
4. CLO4- Perform forecasting for data and interpret them.

Programme Competency Goals

(BBA) Programme Competency Goals (PCGs)		BBA Programme Learning Objectives (PLOs)
		Students will be able to
1	**Responsible Global Citizenship:** Ability to understand the interplay between local and global issues and to act with sensitivity towards ethical and social issues	1. Understand local business issues
		2. Understand global business issues
		3. Demonstrate sensitivity towards ethical issues
		4. Demonstrate sensitivity towards social issues
2	**Effective communication:** Ability to effectively exchange ideas and information	5. Present their ideas with clarity
		6. Write in a coherent manner
		7. Use technology for communication
3	**Critical Thinking:** Ability to identify, analyze business problems and propose effective solutions	8. Identify main issues of business problems
		9. Examine information from different sources
		10. Draw inferences from analysis
4	**Teamwork:** Ability to work and contribute effectively in group -settings	11. Understand the factors to work effectively in groups
		12. Contribute effectively in groups

PLO-PCG Assessments Mapping Matrix

Program Learning Objectives (PLOs)	Program Competency Goals (PCGs)	Course Assessment Item
This course helps you to develop the following Program Learning Outcomes:	This course helps you to develop the following Program Competency Goals:	This learning outcome will be assessed in the following items
PLO1, PLO2, PLO5, PLO6	PCG 1, PCG 2	A1, A2, A3, A4, A5
PLO8, PLO9, PLO10, PLO11, PLO12	PCG3, PCG4	A1, A3, A4, A5

Evaluation Schema

The course grade will be determined based on:

Assessment Task	Weightage (Percentage)	Nature (Individual/Group)	Week of Assessment	PLOs to be Assessed
A1: Group Project	20%	Group	4th Week	PLO1, PLO2, PLO5, PLO6, PLO 8, PLO 9, PLO 10, PLO 11, PLO 12
A2: Quiz	20%	Individual	4th Week and 10th Week	PLO1, PLO2, PLO5, PLO6
A3: Mid-term	20%	Individual	8th Week	PLO1, PLO2, PLO5, PLO6, PLO 8, PLO 9, PLO 10, PLO 11, PLO 12
A4: Class Participation	10%	Individual	Ongoing	PLO1, PLO2, PLO5, PLO6, PLO 8, PLO 9, PLO 10, PLO 11, PLO 12
A5: End term Examination	30%	Individual	JGU Examination period	PLO1, PLO2, PLO5, PLO6, PLO 8, PLO 9, PLO 10, PLO 11, PLO 12

Description of Assessments:

A1: Group Project (20 marks)- The project involves collecting a dataset (at least 200 values), plotting the time series data, and analysing trends using Exponential Smoothing, Regression, Autoregression, ARIMA, and SARIMA, based on tools and techniques learned in class. It also includes a viva voce and a project presentation after the report submission.

A2: Quiz (20 marks)- There will be two in-class MCQ-based quizzes. These closed-book quizzes will test concepts learned in the course up to that point. This will be taken on the UMS portal.

A3: Mid-term (20 marks)- Mid-term examination will be of 20 marks and 90 minutes to be conducted during mid-term week. This will be a pen and paper invigilated exam held on the JGU campus.

A4: Class Participation (10 marks)- Students are expected to be attentive in class and participate in classroom.

A5: End-term Examination (30 marks)- End term examination will be of 30 marks and 90 minutes to be conducted during end-term week. This will be an invigilated exam held on the JGU campus according to the mode decided by CoE.

A1: Project Presentation Rubrics

Rubrics for Assessments (For Group Project & Presentation)

Criteria (Weight)	Excellent	Very Good	Good	Satisfactory	Needs Improvement
Dataset Selection, Time Series Conversion & Visualisation (25%)	Dataset is highly relevant; correctly converted to a time series object; includes full set of visuals (time series plot, seasonal plot, seasonal subseries, lag plot) and complete decomposition.	Dataset is relevant; correctly converted; includes most required plots and partial decomposition.	Dataset is mostly relevant; converted correctly; includes basic plots (e.g., time series and seasonal plots).	Dataset has limited relevance; partially converted or missing key visualisations.	Dataset is irrelevant or not converted; no meaningful plots.
Regression Analysis & Exponential Smoothing (20%)	Clear and deep understanding; all exponential smoothing methods applied (SES, Holt, Holt-Winters) plus regression forecasting with correct interpretation.	Good understanding; most smoothing methods applied correctly; reasonable regression analysis.	Basic understanding; one forecasting method applied with partial interpretation.	Limited understanding; methods applied incorrectly or superficially.	No valid attempt at regression or exponential smoothing.
ARIMA & SARIMA Modelling (25%)	Strong ARIMA and SARIMA modelling with diagnostics, parameter justification, and accurate forecasts for both.	Good ARIMA analysis and solid SARIMA attempt with reasonable forecasts.	ARIMA applied with basic forecasting; limited SARIMA attempt.	Partial or incorrect ARIMA attempt; no meaningful SARIMA work.	No attempt at ARIMA or SARIMA modelling.
Machine Learning Application (20%)	Multiple ML models applied with evaluation metrics and meaningful interpretation	One strong ML model with forecasting and interpretation.	One ML model applied with limited forecasting or partial interpretation.	Minimal or weak ML attempt; incomplete analysis.	No machine learning methods applied.

	linked to context.				
Overall Analysis, Interpretation & Insight (10%)	Insightful, well-reasoned conclusions tied clearly to context.	Good conclusions with clear links to context.	Adequate conclusions; some connection to context.	Weak conclusions; limited connection to context.	No meaningful interpretation or conclusions.

Teaching Method

The course combines lectures and hands-on Python programming. Teaching methods include PPT slides for conceptual understanding and problem-solving, with Python applications using libraries like pandas, statsmodels, scikit-learn, and matplotlib. Problem-solving sessions will demonstrate practical applications of forecasting concepts. Class discussions and Q&A sessions will encourage active participation and critical thinking.

Textbook / Other Readings

Textbook:

TB-1: John E. Hanke and Dean Wichern. 2014. *Business Forecasting*. 9th ed. Pearson.

TB-2: Galit Shmueli, Peter C. Bruce, Peter Gedeck, and Nitin R. Patel. 2025. *Machine Learning for Business Analytics: Concepts, Techniques, and Applications in Python*. 2nd ed.

Other Readings:

TB-3: S. Christian Albright and Wayne L. Winston. 2015. *Business Analytics*. 5th ed. Cengage Learning. (Part IV: Regression Analysis and Time Series Forecasting).

TB-4: Murray R. Spiegel and Larry J. Stephens. 2017. *Schaum's Outline of Statistics*. 6th ed. New York: McGraw-Hill Education.

Session Plan

Session Details	**Topics**	**PLOs Covered**
Session 1	Revision of Basic Concepts of Statistics	PLO8, PLO9, PLO10
Objective of the session	Revise foundational statistical concepts for forecasting.	
Subtopics to be covered	Measures of central tendency, dispersion, correlation, regression, and visualization techniques.	
Readings	TB4: Chapter 3&4	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A Session with the help of PPT presentation	
Session 2	Introduction to Business Forecasting and Data-Driven	PLO1, PLO2,

	Decision Making	PLO8
Objective of the session	Understand the role of business forecasting in decision-making and learn data-driven approaches and predictive analytics essentials.	
Subtopics to be covered	Definition, importance, and applications in business planning; Using historical data for forecasting, analytics in business.	
Readings	TB1: Chapter 1 &2	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A Session with the help of PPT presentation	
Session 3-	Hands On Session- "Types of Forecasting: Qualitative Approaches"	PLO1, PLO2
Objective of the session	Explore qualitative forecasting methods.	
Subtopics to be covered	Delphi method, forecasting by analogy, scenario forecasting with case studies	
Readings	TB1: Chapter 9	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A Session with the help of PPT presentation	
Session 4:	Types of Forecasting: Quantitative Approaches	PLO8, PLO9, PLO10
Objective of the session	Understand quantitative forecasting methods.	
Subtopics to be covered	Overview of time series models, regression, and ML-based approaches.	
Readings	TB1: Chapter 1	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A Session with the help of PPT presentation	
Session 5	Components of a Time Series	PLO8, PLO9, PLO10
Objective of the session	Identify time series components.	
Subtopics to be covered	Trend, seasonality, cyclical, random variations.	
Readings	TB1: Chapter 4	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A Session with the help of PPT presentation	
Session 6	Measures of Forecast Accuracy	PLO8, PLO9, PLO10

Objective of the session	Learn metrics to evaluate forecasts.	
Subtopics to be covered	MAE, RMSE, MAPE, and their applications.	
Readings	TB1: Chapter 2	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A Session with the help of PPT presentation	
Session 7	Hands On Session- "Time Series Visualization in Python"	PLO8, PLO9, PLO10
Objective of the session	Practice importing and plotting time series data.	
Subtopics to be covered	Using pandas and matplotlib for time series plots.	
Readings	TB1: Chapter 4	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A Session with the help of PPT presentation, Python programming.	
Session 8	Moving Average Methods	PLO8, PLO9, PLO10
Objective of the session	Understand moving average techniques.	
Subtopics to be covered	Simple, weighted, and exponential moving averages.	
Readings	TB1: Chapter 3	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A Session with the help of PPT presentation	
Session 9	Exponential Smoothing	PLO8, PLO9, PLO10
Objective of the session	Learn simple exponential smoothing.	
Subtopics to be covered	Theory, applications, and limitations.	
Readings	TB1: Chapter 3	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A Session with the help of PPT presentation	
Session 10	Trend Projections and Holt's Method	PLO8, PLO9, PLO10
Objective of the session	Explore trend-based forecasting.	
Subtopics to be covered	Holt's linear method, applications in Python.	
Readings	TB1: Chapter 3	
Case Title & Number	N/A	

Pedagogy	Class discussion and Q&A Session with the help of PPT presentation, Python programming.	
Session 11	Guest Lecture--1	PLO1, PLO2
Objective of the session	Learn forecasting applications in industry.	
Subtopics to be covered	Real-world use cases in marketing, supply chains, or finance.	
Readings	N/A	
Case Title & Number	N/A	
Pedagogy	Guest speaker presentation, Q&A with PPT.	
Session 12	Regression Analysis for Forecasting	PLO8, PLO9, PLO10
Objective of the session	Apply regression for forecasting, Measuring trend.	
Subtopics to be covered	Linear regression, applications in Python.	
Readings	TB1: Chapter 7	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A Session with the help of PPT presentation	
Session 13	Measure of Goodness and Standard Error	PLO8, PLO9, PLO10
Objective of the session	Evaluate regression models.	
Subtopics to be covered	R-squared, standard error, residual analysis.	
Readings	TB1: Chapter 2	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A Session with the help of PPT presentation	
Session 14	Seasonality and Seasonal Index	PLO8, PLO9, PLO10
Objective of the session	Understand seasonality in forecasting.	
Subtopics to be covered	Calculating seasonal indices, Ratio to Trend Method	
Readings	TB1: Chapter 3	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A Session with the help of PPT presentation	
Session 15	Holt-Winters Method	PLO8, PLO9, PLO10
Objective of the session	Learn Holt-Winters for seasonal data.	
Subtopics to be covered	Additive and multiplicative models in Python.	

Readings	TB1: Chapter 3	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A Session with the help of PPT presentation, Python programming.	
Session 16	Decomposition Method	PLO8, PLO9, PLO10
Objective of the session	Decompose time series data.	
Subtopics to be covered	Discuss time series data.	
Readings	TB1: Chapter 4	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A Session with the help of PPT presentation, Python programming.	
Session 17-	Hands On Session- "Applying Decomposition in Python"	PLO8, PLO9, PLO10
Objective of the session	Practice time series decomposition.	
Subtopics to be covered	Decomposing real-world datasets using statsmodels.	
Readings	TB1: Chapter 4	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A Session with the help of PPT presentation, Python programming.	
Session 18	Autoregression AR(p)	PLO8, PLO9, PLO10
Objective of the session	Introduce AR(p) models and show how to identify, estimate, and apply them in forecasting.	
Subtopics to be covered	AR(1), AR(2) and general AR(p) form, Lag operator notation, Stationarity condition), PACF cut-off property.	
Readings	TB1: Chapter 8	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A Session with the help of PPT presentation.	
Session 19	Moving Average MA(q)	PLO8, PLO9, PLO10
Objective of the session	Explain MA(q) models, their identification, and estimation.	
Subtopics to be covered	MA(1), MA(2) and general MA(q) form., ACF cut-off property, Concept of invertibility.	
Readings	TB1: Chapter 8	
Case Title & Number	N/A	

Pedagogy	Class discussion and Q&A Session with the help of PPT presentation.	
Session 20	ARIMA & SARIMA	PLO8, PLO9, PLO10
Objective of the session	Integrate AR and MA into ARIMA models and introduce seasonal extensions (SARIMA) for handling seasonality in business data	
Subtopics to be covered	ARIMA(p,d,q): model structure and order identification, Seasonal ARIMA (SARIMA): handling seasonal trends and cycles, Model estimation, diagnostics, and forecasting using statsmodels.	
Readings	TB1: Chapter 8	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A Session with the help of PPT presentation, Python programming.	
Session 21	Guest Lecture--2	PLO1, PLO2
Objective of the session	Explore advanced forecasting applications in industry.	
Subtopics to be covered	Real-world use cases showcasing machine learning in demand forecasting, predictive maintenance in supply chains, or risk analytics in finance.	
Readings	N/A	
Case Title & Number	N/A	
Pedagogy	Guest speaker presentation, Q&A with PPT.	
Session 22	Introduction to Machine Learning for Forecasting	PLO8, PLO9, PLO10
Objective of the session	Explore ML applications in forecasting.	
Subtopics to be covered	Supervised learning basics, regression models.	
Readings	TB2: Chapter 2&6	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A Session with the help of PPT presentation.	
Session 23	Logistic Regression for Forecasting	PLO8, PLO9, PLO10
Objective of the session	Apply logistic regression to forecasting problems.	
Subtopics to be covered	Binary outcome prediction, Python implementation (scikit-	

	learn).	
Readings	TB2: Chapter 10	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A Session with the help of PPT presentation, Python programming.	
Session 24	Hands On Session - "Machine Learning Applications"	PLO8, PLO9, PLO10
Objective of the session	Apply ML techniques to business forecasting.	
Subtopics to be covered	Case studies using Python for ML-based forecasting.	
Readings	TB2: Chapter 24	
Case Title & Number	N/A	
Pedagogy	Hands-on Python programming, group discussions.	
Session 25	Monte Carlo Simulation	PLO8, PLO9, PLO10
Objective of the session	Learn Monte Carlo simulation for risk analytics.	
Subtopics to be covered	Simulation basics, applications in forecasting.	
Readings	TB2: Chapter 5	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A Session with the help of PPT presentation, Python programming.	
Session 26	Predictive Analytics in Python	PLO8, PLO9, PLO10
Objective of the session	Implement predictive analytics techniques.	
Subtopics to be covered	Monte Carlo and ML models in Python.	
Readings	TB2: Chapter 18 &19	
Case Title & Number	N/A	
Pedagogy	Python programming session.	
Session 27	Project Presentation-1	PLO5, PLO6, PLO11, PLO12
Objective of the session	Present group projects.	
Subtopics to be covered	Time series analysis on real-world datasets.	
Readings	N/A	
Case Title & Number	N/A	
Pedagogy	Presentations and Q&A with PPT.	
Session 28	Project Presentation-2	PLO5, PLO6, PLO11, PLO12
Objective of the session	Present group projects.	

Subtopics to be covered	Time series analysis on real-world datasets.	
Readings	N/A	
Case Title & Number	N/A	
Pedagogy	Presentations and Q&A with PPT.	
Session 29	Reading and Revision Week	PLO8, PLO9, PLO10
Objective of the session	To revise the syllabus	
Subtopics to be covered	Revise broad topics of the course before end term exam	
Readings	N/A	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A with PPT, Python exercises.	
Session 30	Reading and Revision Week	PLO8, PLO9, PLO10
Objective of the session	To revise the syllabus	
Subtopics to be covered	Revise broad topics of the course before end term exam	
Readings	N/A	
Case Title & Number	N/A	
Pedagogy	Class discussion and Q&A with PPT, Python exercises.	

Disability Support

JGU endeavours to make all its courses accessible to students. The Disability Support Committee (DSC) has identified conditions that could hinder a student's overall well-being. These include physical and mobility related difficulties, visual impairment, hearing impairment, mental health conditions and intellectual/learning difficulties e.g., dyslexia and dyscalculia. Students with any known disability needing academic and other support are required to register with the Disability Support Committee (DSC) by following the procedure specified at **https://jgu.edu.in/disability-support-committee/**

Students who need support may register any time during the semester up until a month before the end semester exam begins. Those students who wish to continue receiving support from the previous semester, must re-register within the first month of a semester. Last minute registrations and support might not be possible as sufficient time is required to make the arrangements for support.

The DSC maintains strict confidentiality about the identity of the student and the nature of their disability and the same is requested from faculty members and staff as well. The DSC takes a strong stance against in-class and out-of-class references made about a student's disability without their consent and disrespectful comments referring to a student's disability.

All general queries are to be addressed to **disabilitysupportcommittee@jgu.edu.in**

***Disclaimer: This course outline including assessments, sessions and/or readings may be revised during the semester if such need arises.**