



Course Specification

— (Postgraduate)

Course Title: Time Series Analysis

Course Code: 202667-3

Program: M.Sc. in Statistics

Department: Mathematics and Statistics

College: Science

Institution: Taif University

Version: 2023

Last Revision Date: 7/4/1445



Table of Contents

<u>A. Course Identification</u>	<u>3</u>
<u>B. Course Objectives and Learning Outcomes</u>	<u>3</u>
1. <u>Course Description</u>	<u>3</u>
2. <u>Course Main Objective</u>	<u>3</u>
3. <u>Course Learning Outcomes</u>	<u>3</u>
<u>C. Course Content</u>	<u>4</u>
<u>D. Teaching and Assessment</u>	<u>4</u>
1. <u>Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods</u>	<u>4</u>
2. <u>Assessment Tasks for Students</u>	<u>5</u>
<u>E. Student Academic Counseling and Support</u>	<u>5</u>
<u>F. Learning Resources and Facilities</u>	<u>5</u>
1. <u>Learning Resources</u>	<u>5</u>
2. <u>Educational and research Facilities and Equipment Required</u>	<u>6</u>
<u>G. Course Quality Evaluation</u>	<u>6</u>
<u>H. Specification Approval Data</u>	<u>6</u>



A. General information about the course:

1. Course Identification:

1. Credit hours: (3)

2. Course type

A. University College Department Track

B. Required Elective

3. Level/year at which this course is offered: (N/A)

4. Course general Description:

5. Pre-requirements for this course (if any):

6. Pre-requirements for this course (if any):

7. Course Main Objective(s):

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3	100%
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 		
4	Distance learning		





3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify).....	
	Total	

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Recognize the fundamentals of time series	K1	<ul style="list-style-type: none"> Lectures Group discussions 	<ul style="list-style-type: none"> Quizzes Exams Assignments
1.2	Outline Autocorrelation and partial autocorrelation functions	K2	<ul style="list-style-type: none"> Lectures Group discussions 	<ul style="list-style-type: none"> Quizzes Exams Assignments
1.3	Outline statistical forecasting	K2	<ul style="list-style-type: none"> Lectures Group discussions 	<ul style="list-style-type: none"> Quizzes Exams Assignments
1.4	Describe Box-Jenkins modes.	K3		
2.0	Skills			
2.1	Apply the studied methods to find the probabilities from univariate and multivariate distributions.	S2	<ul style="list-style-type: none"> Lectures Group discussions 	<ul style="list-style-type: none"> Quizzes Exams Assignments
2.2	Evaluate , and compare between .models	S4	<ul style="list-style-type: none"> Lectures Group discussions 	<ul style="list-style-type: none"> Quizzes Exams Assignments
...				
3.0	Values, autonomy, and responsibility			
3.1	Participate effectively	V1	Projects	Through the oral



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	within groups and independently.			presentation of the projects.
3.2	Express mathematical and statistical ideas orally and in writing	V4	Projects	Through the oral presentation of the projects.
...				

C. Course Content:

No	List of Topics	Contact Hours
1.	Meaning of time series, Introduction to Time Series	9
2.	Definitions of trends, seasonality, and noise, Stationary processes, definition, and examples, autocovariance, autocorrelation	9
3.	Linear Filtering: Definitions and the Theorem of Filtering Convolutions and compositions, causal processes, ARMA Processes: Solving the ARMA equation, Applications and Examples	9
4.	Non-stationary Processes: ARIMA and SARIMA processes, simulations, and examples, Exponential Smoothing Based Methods: Time series smoothing, first and second order smoothing Modeling higher-order exponential smoothing	9
5	Implementation of Auto-Regressive model, Application with some soft ware R , SPSS, Minitab ,...ect.	9
Total		45

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes + Homeworks+ oral presentation +written test+ group project	Continues	%30
2.	Final exam	16th	%70
3.			
...			

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References
Peter J. Brockwell , Richard A. Davis. Introduction to Time Series and Forecasting Springer 3rd ed. 2016 Edition





Supportive References	<u>Robert H. Shumway and David S. Stoffer Time Series Analysis and Its Applications With R Examples, Springer, 2016.</u>
Electronic Materials	
Other Learning Materials	Blackboard system

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture halls, containing white boards, and electronic monitors - The seats fit the number of students - Laboratories equipped with suitable numbers of computers
Technology equipment (Projector, smart board, software)	Data Show
Other equipment (Depending on the nature of the specialty)	Wi-Fi internet connections

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Students	Indirect
Quality of learning resources	Peer reviewer	Direct
The extent to which CLOs have been achieved	Peer reviewer	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

COUNCIL /COMMITTEE	Department of Mathematics and Statistics
REFERENCE NO.	
DATE	7/4/1445

