

# MS4262: ADVANCED ANALYTICS USING SAS

---

## Effective Term

Semester A 2022/23

## Part I Course Overview

### Course Title

Advanced Analytics using SAS

### Subject Code

MS - Management Sciences

### Course Number

4262

### Academic Unit

Management Sciences (MS)

### College/School

College of Business (CB)

### Course Duration

One Semester

### Credit Units

3

### Level

B1, B2, B3, B4 - Bachelor's Degree

### Medium of Instruction

English

### Medium of Assessment

English

### Prerequisites

MS3251 Analytics using SAS

### Precursors

Nil

### Equivalent Courses

MS3218 Advanced SAS Programming

### Exclusive Courses

Nil

## Part II Course Details

### Abstract

This course aims to :

- Provide students with concepts and knowledge of advanced analytics using SAS for data preparation and performing sophisticated data analysis so as to deliver information across the organization and solve problem in complex business situations.
- Enhance students' analytics to perform effectively and efficiently data analytic technique in different industries such as communications, financial services, the government, insurance, hotels, manufacturing, retail, and banking for analytic purposes, such as to achieve a greater return on customer relations, to measure and manage risk;
- Develop students' skills in improving the productivity, automating and customizing data analysis and generating advanced statistical report to different business industries through hands-on experience.

### Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Discuss the relevant concepts of advanced analytics in data management by iterative processing and user-defined procedures.	10		x	
2	Apply advanced data handling technique to prepare the data and improve the efficiency and performance, including variable selection, data sampling technique, lookup technique, vertical data handling, categorized data handling;	20		x	x
3	Discuss the advanced method of data manipulation, variable selection, observation selection using structure query by SAS	25		x	
4	Produce complex descriptive statistics in enhanced tabular format to organize and analyze the data for comparison and identification of critical issues in various business problems.	20		x	x
5	Implement various analytics skills to automate and customize business solutions in complex situations.	25		x	x

#### A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

#### A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

#### A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

**Teaching and Learning Activities (TLAs)**

TLAs		Brief Description	CILO No.	Hours/week (if applicable)
1	Lecture	Concepts and general knowledge of various advanced analytics using SAS in performance in data preparation, enhanced statistical reporting, structured query by SAS for data analysis and SAS macro language are explained; Business examples regarding the applications of data enhanced reporting;	2, 3, 4, 5	
2	Tutorial	Hands-on practice to enhance their skills in advanced analytics using SAS so that learning difficulties can be identified and tackled.	1, 2, 3, 4, 5	

**Assessment Tasks / Activities (ATs)**

ATs		CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Assignment	1, 2, 3, 4, 5	20	
2	Mid-term Test	2, 3, 4, 5	30	

**Continuous Assessment (%)**

50

**Examination (%)**

50

**Examination Duration (Hours)**

3

**Assessment Rubrics (AR)****Assessment Task**

Assignment

**Criterion**

ABILITY to UNDERSTAND the knowledge of advanced analytics using SAS

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

---

**Assessment Task**

Mid-term Test

**Criterion**

ABILITY to EXPLAIN the key concepts and logical algorithm of advanced analytics using SAS

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

---

**Assessment Task**

Written Examination

**Criterion**

ABILITY to EXPLAIN in DETAIL to test students' grasp of applying advanced analytics techniques and concepts for processing accessing data across multiple sources.

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

---

## Part III Other Information

### Keyword Syllabus

#### Review of Analytics using SAS

Refreshing concepts and general knowledge of analytics using SAS.

#### Advanced Techniques and Efficiencies

Improve the efficiency and performance; Handling vertical data using Lookup techniques; Data sampling techniques; Variables selection; Grouping processing and sorting

#### Enhanced Reporting

Producing descriptive statistics tables with multi-dimensions; Accumulating statistics and percentage by one or more stratifying variables; Formatting report layout; Formatting report-items.

#### Structured Query by SAS

Variable selection; Missing data handling; data modification; Outlier handling; Summarizing data; Data merging; Report generation;

#### Automate and Customize SAS Applications

Introducing basic concepts of SAS Marco facility; Creating and using SAS Marco variable; Creating and using SAS Marco functions; Interfacing DATA step and Procedure step; Create customize and automate regular statistical report;

### Reading List

#### Compulsory Readings

Title	
1	Sunil Gupta 2016. Sharpening Your Advanced SAS Skills. CRC Press

#### Additional Readings

Title	
1	Haworth, Lauren E. 1999, PROC TABULATE by Example. Cary, NC: SAS Institute Inc.
2	Burlew, Michele M. 2006. SAS Macro Programming Made Easy, Second Edition. Cary, NC: SAS Institute Inc.
3	Carpenter, Art. 2016. Carpenter' s Complete Guide to the SAS Macro Language, Third Edition. Cary, NC: SAS Institute Inc.
4	Lafler, Kirk Paul. 2013. PROC SQL: Beyond the Basics Using SAS, Second Edition. Cary, NC: SAS Institute Inc.
5	Farmer, Susan and Lampton, Marjorie. 2007. SAS Programming III: Advanced Techniques and Efficiencies, SAS Course Notes. Cary, NC: SAS Institute Inc.