

# Department of Management

Amrita Vishwa Vidyapeetham

Amritapuri

Term V (Oct to December 2017)

**Course Title:** Analytics In Operations

**Course Code:** **OM 619 E**

**Credits:** 3

**Total Sessions:** 24

**Course Instructor:** Abhijath.V

**Contact Information:** [abhijath@gmail.com](mailto:abhijath@gmail.com) 9645075151

**Course Link:**

**Office:**

**Office hours:**

**Course contributes mostly to:** Employability/ Entrepreneurship/ Practical Orientation

## **Course Description**

Analytics In Operations examines the application of analytic techniques to challenges/situations in decision making/analysis at strategic/tactical and operational levels in the functional area of Operations Management

Analytics based methods and models have today been a differentiator in the decision-making process in organizations. Businesses today have a challenge of data overload and through mining needs to make use of this data for meaningful information that results in intelligent decisions. With datafication being a reality today, the issue that operating systems need to address is use of diagnostic/predictive/prescriptive and operational analytics in designing, operating and improving processes and systems that produce goods and deliver services.

The above phenomenon has also been made necessary due to improvements in computing technology, complex nature of businesses today and the huge consequences of a poor decision or Indecision. The complexity of the customer, need for virtual operations, global nature of business and operations, need for integrating operations technology and Information technology, need to integrate performance measures and holistic viewing of the same have only given further impetus to the increased relevance of Analytics in Operational decision making.

## **Course Objectives (CO)**

1. Describe common concepts and tools used to support operational decision-making.
2. Formulate, implement, and interpret practical operational analytics models in a computing environment.
3. Explain the role of operational analytics in aiding sound decision-making.
4. Identify risks in operations and address the same using appropriate models
5. Exposure to practical analysis tools in decision making and problem solving in operations
6. Develop a multi-dimensional approach to problem solving/decision making

### **Alignment of course objectives (CO) with learning goals (LG) of Assurance of Learning**

The course is designed to address systematically the following processes involved in Decision making using Analytics in organizations

- a) Collect, Organise data
- b) Aggregate data
- c) Mine through data
- d) Visualize data
- e) Analyze data
- f) Decision making
- g) Actionable insights
- h) Knowledge development

The course is designed to let students systematically go through each stage and understand how using analytics adds value to the decision making process. Students are made to work on data for each area in Operations management decision making and encouraged to apply the appropriate models

LG CO	Critical and integrative Thinking	Effective written and oral communication	Societal and Environmental Awareness	Ethical Reasoning	Leadership
CO1	3	2	1	2	3
CO2	3	3	1	2	2
CO3	3	3	1	2	3
CO4	3	3	1	2	3
CO5	3	3	1	2	2
CO 6	3	2	1	2	2

Key: 3 – Highly relevant; 2 – Moderately relevant; 1 – Low relevance; 0- No relevance

### Unit Wise scope for outcomes and Bloom's taxonomy

Students are encouraged to

- Attend all lectures. Be an active listener/participant.
- Read the text and other instructional materials.
- Be ahead of class lectures by pre-reading the Chapters and come to class fully ready to discuss the issues/topics
- Participate in discussions of case studies of organizations involved in application of analytics in decision making
- In your study group / teams, conduct comprehensive analyses of case studies.
- Practice solving the problems assigned
- Work on live problems

Bloom's Levels of ng	CO 1	CO 2	CO 3	CO 4	CO 5	CO6	
<b>Creating</b>	X		X	X	X	X	
<b>Evaluating</b>	X	X	X		X	X	
<b>Analyzing</b>	X	X	X	X	X	X	
<b>Applying</b>		X	X	X	X	X	
<b>Understanding</b>	X	X	X	X	X	X	
<b>Remembering</b>	X	X	X	X	X	X	

### **Course Structure**

Part I—Basic overview of Analytics in Operations and its applications

Part II—Analytics in Strategic planning

Part III-Analytics in Tactical planning

Part IV—Analytics in Operational ;planning

Part V-Other models

### **| Pedagogy**

- Case studies
- Individual presentations
- Group presentations
- Role play
- Class discussions
- Group and individual assignments
- Videos
- Live exercises
- Models
- Software's available

## Course Evaluation

Sl no	Assessment Exercise	Description	Weight
Group Assessment			
1	Group assignments	<i>Cases</i>	10%
		<i>Group Exercises</i>	10%
		<i>Live problem solving</i>	10%
		<i>Problem solving</i>	10%
Individual assessment			
2	End term exam	<i>Final Exam</i>	40%
	Individual assignments	<i>Short cases and readings</i> <i>Problem solving</i> <i>In class exercises</i>	20%

## **Course Requirements**

1. Scholastic dishonesty will not be tolerated
2. Attendance rules will have to be adhered in full
3. Submission rules of exams and assignments need to be followed
4. Preparations for sessions as per session plan is a must
5. Participation and involvement in class and outside exercises/cases is a must

**Textbook:** The textbook is *The Applied Business Analytics Casebook, Applications in Supply Chain Management, Operations Management and Operations Research*. By Matthew J. Drake, 978-0-13-340736-5.

Course makes of commercially available operations software's/MS Excel/R

Session plan and coverage-

Session number	Topic	Coverage details Note: Prior to class and after class data sets and problems to be collected for work out  Decision implications and a quick assessment of models will be done in class
1-3	Introduction to course	<input type="checkbox"/> Scope of analytics <input type="checkbox"/> Data vs information and decision making <input type="checkbox"/> Scenarios of decision making <input type="checkbox"/> Intelligence in business <input type="checkbox"/> Manufacturing 4.0 and IOT <input type="checkbox"/> Patterns and its relevance <input type="checkbox"/> Types of analytics <input type="checkbox"/> Relation to operational performance metrics
4-5	Data visualization techniques	<input type="checkbox"/> Introduction to various data visualization methods
6	Selective inventory control modelling	<input type="checkbox"/> Modeling and decision implications <input type="checkbox"/> Spend analysis
7	Simulation modelling	<input type="checkbox"/> Revenue <input type="checkbox"/> Maintenance <input type="checkbox"/> Inventory
8-9	Inventory modelling	<input type="checkbox"/> Different types of inventory modelling <input type="checkbox"/> Service level related modelling and decisions <input type="checkbox"/> Retail discounting modelling
10	Procurement /SCM modelling	<input type="checkbox"/> Procurement performance modelling <input type="checkbox"/> Supplier rating and evaluation models

		<input type="checkbox"/> Cost modelling in SCM <input type="checkbox"/> Procurement intelligence
11	Regression	<input type="checkbox"/> Scenarios involving regression modelling
12	Data envelopment Analysis	<input type="checkbox"/> Use of DEA in productivity measurement and performance comparison
13	Queueing and waiting line modelling	<input type="checkbox"/> Application of queuing theory and waiting line modelling in practical operations challenges
14	Forecasting models	<input type="checkbox"/> Application of Forecasting modelling in practical operations challenges
15	Reliability and warranty modelling	
16	Inspection modelling	<input type="checkbox"/> OC curve/inspection criteria based modelling
17-18	Models in operations planning	<input type="checkbox"/> AP/MPS/MRP/ATP/RC P/DCP <input type="checkbox"/> Capacity modelling and analysis including financial analysis <input type="checkbox"/> CVP modelling <input type="checkbox"/> Line balancing <input type="checkbox"/> Scheduling models <input type="checkbox"/> Location modelling
19-20	Yield management	<input type="checkbox"/> Modelling yield management and its application in capacity management/revenue management/overbooking
21-22	Modelling service delivery systems and evaluating performance	
23-24	Project modelling	<input type="checkbox"/> Performance modelling <input type="checkbox"/> EVA <input type="checkbox"/> Resource modelling
25	Summary and evaluation	

## Contribution to placement

- Development of analytical skills
- Problem solving skills
  
- Confidence to use tools
- Ability to visualize data and infer decisions
  
- Multi-dimensional thinking development