INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES
DAVV, INDORE

Syllabus

MBA (MS) 5 Years Integrated Course
Istto VIthSemester

Batch 2018 -2023

Semester - VI

Code	Subject
IM-601D	Fundamentals of Machine Learning and Artificial Intelligence
IM-602A	Entrepreneurship
IM-603A	Forecasting Techniques
IM-604A	Financial Management II
IM-613	Business Environment
IM-614	Production and Operation Management
IM -615	Lab- Data Visualisation

IM- 601D FUNDAMENTALS OF MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE

Course Objectives:
The basic aim of the course is to acquaint students with the fundamentals of machine learning and artificial intelligence techniques for creating a base for using these tools in modern day business and in future paradigm where the whole business is shifting to its applications.

Course Contents:

1. **Introduction**: Definition of learning systems. Goals and applications of machine learning. Aspects of developing a learning system: training data, concept representation, function approximation.
2. **Inductive Classification**: The concept learning task. Concept learning as search through a hypothesis space. General-to-specific ordering of hypotheses. Finding maximally specific hypotheses. Version spaces and the candidate elimination algorithm. Learning conjunctive concepts. The importance of inductive bias.
3. **Decision Tree Learning**: Representing concepts as decision trees. Recursive induction of decision trees. Picking the best splitting attribute: entropy and information gain. Searching for simple trees and computational complexity. Occam's razor. Overfitting, noisy data, and pruning.
4. **Rule Learning: Propositional and First-Order:** Translating decision trees into rules. Heuristic rule induction using separate and conquer and information gain. First-order Horn-clause induction (Inductive Logic Programming) and Foil. Learning recursive rules. Inverse resolution, Golem, and Progol.
5. **Clustering and Unsupervised Learning**: Learning from unclassified data. Clustering. Hierarchical Aglomerative Clustering. k-meanspartitional clustering.
6. **Artificial Neural Networks**: Neurons and biological motivation. Linear threshold units. Perceptrons: representational limitation and gradient descent training. Multilayer networks and backpropagation. Hidden layers and constructing intermediate, distributed representations. Overfitting, learning network structure, recurrent networks.
7. **Tools for Machine Learning**: Introduction to Weka and KNIME tools. Decision tree induction of real world data using the tools. Clustering of data using the tools. Learning through neural networks using the tools.

Textbook:-

1. Tom Mitchell, Machine Learning, McGraw Hill.

Reference Books:-

1. Bishop, C. (2006). Pattern Recognition and Machine Learning. Berlin: Springer-Verlag.
2. Hastie, T., Tibshirani, R., and Friedman, J. (2001). The elements of Statistical Learning - Data Mining, Inference, and Prediction. Berlin: Springer-Verlag.
3. Tan, P-N., Steinbach, M., and Kumar, V. (2004). Introduction to Data Mining. New York: Addison-Vesley

IM- 602AENTREPRENEURSHIP

Course Objectives:

This course is designed to enhance Entrepreneurial skills among the management students. Basic fundamentalsof Entrepreneurship are intended for students who want to have their own venture/business.

Course Contents:

1. **Entrepreneurship:** An Introductionto the concept of entrepreneurship, Characteristics of an entrepreneur, functions of an entrepreneur.
2. **Entrepreneurship and its environment**: External: Market, economy, political & legal, technology, social and cultural.Internal: materials, machines &equipments, processes, capital, labour.
3. **Problems and challenges of organizations/enterprises**- Economic (capital, material and labor)

   Non-economic (social, political and personal)
4. **Financial management issues**- Financial requirement and its planning, balance sheet and income statement, determination of cost, cost-volume-profit analysis.
5. **Marketing management issues**- Functions of marketing, concept of product life cycle, issues related to product and its design, distribution, promotion, price.
6. **Human resource management issues**-HR planning, recruitment & selection, training & development, performance appraisal, motivation, compensation & rewards, relevant labor laws.
7. **Legal issues**- Patent, Copyrights, Trademarks.
8. **New venture expansion strategies and issues**- Joint venture, acquisition, merger, franchising.

Books

1) Entrepreneurship for SSI: Vasant Deasi (Text Book)
2) Entrepreneurship: New Venture Creation: David H. Holt
3) Entrepreneurship in small Scale factor: D Naxendra Kumar
4) Entrepreneurship development – Programs & Practices: Jasmer Singh Saini
5) Entrepreneurship: strategies & resources: Marc. J. Dollinger
6) Entrepreneurship: Hirsch Peters

IM-603A FORECASTING TECHNIQUES

Course Objectives:
To familiarize the students with the substantive understanding of the concepts of forecasting and various forecasting techniques with special reference to business. Futurology as input for planning and decision making in business would broaden the ideas of the students of management science.

Course Content:

1. **The role of forecasting** in planning, relating forecasting and planning in business organization, forecasting as input to planning &decision making. Basic concepts of business forecasting and planning, Contribution of forecasting to analysis & understanding (the variance as a measure of risk, marginal analysis, elasticity, costing, seasonal & cyclic considerations, simulation & sensitivity analysis.
2. **Fundamental of quantitative forecasting**; criteria for evaluation; ME, MAD, MSE, RMSE (SDE), PE, MPE, MAPE. Theil's U-statistics, Introduction to quantitative and technological forecasting. Quantitative v/s qualitative forecasting.
3. **Time series methods of forecasting**; single and double moving averages. Single and double moving averages. Single exponential smoothing, adaptive response rate single exponential, smoothing. Double exponential smoothing, Brown's one parameter ad Holt's two parameter methods.
4. **Forecasting through Regression** (Simple and Multiple) using Matrix approach.
5. **Introduction to Box-Jenkins** (ARIMA) models.
6. **Introduction to input output analysis**, the specification, estimation & forecasting through input-output analysis.
7. **Quantitative & technological** methods for forecasting; subjective assessment methods, sales force composite methods formal surveys & market research based assessments, subjective probability assessments. Exploratory methods – scenario development, Delphi, cross-impact matrices, curve fitting. Analogy methods, morphological search, catastrophe & planning in business organization.

BOOKS

- Makridakis Wheelwright and McGee (1983): Forecasting: Methods and Applications, John Wiley and Sons (Latest edition)

IM-604A FINANCIAL MANAGEMENT-II

Course Objective:

This course is designed to enhance the understanding of the basic financial functions including Capital budgeting, Financing decision and Dividend decisions.

Course Contents:

1. **Financial Management**: Review of finance functions, financial goal; Profit maximization v/s Wealth maximization, Review of time value of money.

2. **Capital Budgeting Decisions** I: Non-time discounted techniques of capital budgeting-Nature and Types of investment decisions, Investment evaluation techniques- Payback, ARR.

3. **Capital Budgeting Decisions II**: time discounted techniques of capital budgeting - NPV, IRR, PI.

4. **Financing Decisions-I**: Capital structure, Theories, Designing capital structure.

5. **Financing Decisions-II** Concept of leverage, Operating leverage, Financial leverage, and Combine leverage.

6. **Dividend Decisions**: Dividend theory, Dividend Policy-Objective, Stability, Practical considerations in dividend policy; Dividend Forms- Bonus Shares, Share Split, Buy Back of Shares.

7. **Case Studies**

BOOKS

- Financial Management by Khan & Jain(5^{th} edition), McGraw Hill Education Private Limited
- Financial Management by I. M. Pandey (10th edition), Vikas Publishing House Pvt Ltd.
- Fundamental of Financial Management; James C Van Horne & John M Wachowicz, Jr, Pearson Education
- Financial Management and Policy; James C Van Horne & Sanjay Dameja, (10^{th} edition) Pearson Education

IM – 613BUSINESS ENVIRONMENT

Course Objective:-

To acquaint students with the practical application of the factors that affect business

Course Content:-

1) **Meaning of Business Environment** - Business & Business Environment, Nature of Business in 21st century, Components of Business Environment, Stages of & Techniques for environmental analysis.
2) **Economic Environment** - Nature & Structure of Economy, Anatomy of Indian Economy, Economic Reforms, Economic Policies: - Industrial, Monetary & Fiscal Policies, Case Studies.
3) **SWOT Analysis** of Indian Economy. Recent Developments in Business Environment of India: - Privatization & Disinvestment – Mode, reasons, problems and Indian scenario; Foreign Investment. Case Studies.
4) **International Business Environment**:- Globalization- Meaning, scope, phases, indicators; WTO &GATT, Post 2007 International Economic Crisis, Case Studies.
5) **International Financial Markets** and Indian Business, Capital account Convertibility, global capital flow paradox, Forex Reserve Management and its impact on Indian Business. Case Studies.
6) **Business Ethics** – Social Environment and Business, Corporate Social responsibility, Corporate Governance, Technological development and its impact on various stakeholders of society. Case Studies.
7) **Business and Nature**: Economic development and Environment, market failure, Externalities, Economic solution to environmental problem. Ethical responsibility of Business towards nature. Case Studies.

BOOKS:-

- Francis Cherullinum- Business Environment, Himalaya Publishing House, New Delhi
- K. Aswathappa – Essentials of Business Environment, Himalaya Publishing House, New Delhi
- Mishra &Puri – Economic Environment in India, Himalaya Publishing House, New Delhi
- Justin Paul:- Business Environment – Text & Cases, McGraw Hill Companies, New Delhi
- Raj Agrawal - Business Environment, Excel Books, New Delhi
- Dutt&Sundaram – Indian Economy, S. Chand & Co. New Delhi
- I.J. Ahluwalia &I.M.D. Little – India's Economic Reforms and Development, Oxford University Press, New Delhi.

IM-614PRODUCTION & OPERATIONS MANAGEMENT

Course Objective:
To provide an awareness of the role of Production and operations management in the functioning of a business organization.

Course Content

1. Introduction to Production & Operations Management- Definition, Production Functions and its environment, Types of production system, Functions of Production/Operations Manager, Organization of Production Function, Difference between Production & Operations Manager. **Basic Concept of Productivity and Productivity Management:** Introduction, Dynamics of Productivity Change, Factors influencing productivity.

2. Facility Location and Product /Service Planning: Product Selection and Design, Process and Technology Selection, Choice of optimal location, Factor affecting Plant Location, location models (Centre of Gravity Model, Median Model, Break Even Analysis, Brown & Gibson Model)

3. Layout Decision: Types of layout, layout factors, Layout procedure and techniques, Line balancing-concept of line mass production system, objectives of assembly line balancing, Material Handling Concepts

4: Forecasting and Aggregate Production Planning : Introduction to Forecasting, Methods of Forecasting (Delphi, Moving Average, Least Square), Aggregate planning-strategies, Quantitative methods of aggregate planning

5. Master production schedule (MPS) and Material Requirement planning (MRP): MPS concept and its calculations, BOM (Bill of Materials), Structure of BOM, MRP concept and MRP Planning ,Concept of Capacity requirement planning(CRP) and Resource requirement planning(RRP).

6.Operations Scheduling: Production Activity Control for Mass Manufacturing, batch processing and Job shop -n-jobs on single machine, n-jobs on Two/Three machines (Johnson's Rule), 2-jobs on m machines (Graphical method – Aker's Algorithm)

7. Capacity Calculation and Utility of Modern Production and Management Tools: Determination of Plant Capacity, Capacity Measurement and Decision, Concept of Just in time manufacturing(JIT), computer integrated manufacturing (CIM) , computer aided manufacturing and design (CAD/CAM) and flexible manufacturing system(FMS), Kaizen , world class manufacturing

BOOKS

- Applied Production and Operations Management- James R. Evans
- Production & Operations Management- K. Shridhara Bhat
- Production and Operations Management-R. Paneeerselvam
- Modern Production / Operations Management, Buffa ES& Sarin RK.
- Operations Management- Norman Gaither, Greg Frazier
- Operations Management: Strategy and Analysis, KrajewskiLee J &Ritzman Larry P, Addison Wesley.
- Productivity Management - A System Approach:-PremVrat, G.D.Sardana&B.S.Sahay (Narosa Pub. House)
- Productivity Engg. & Management- David V Seemanth (TMH)

IM – 615LAB- DATA VISUALISATION

Course Objective - The objective of this course is to provide hands on experience to students in presentation of data in table, pictorial or graphical format. Such visual presentation will help in providing better insight in decision-making. The student will learn to design data visuals with different visual encodings, create different type of charts and maps in Excel / Tableau.

Evaluation - The faculty member will award internal marks out of 40 based on three assessments of 20 marks each of which best two will be considered. The end semester examination will be worth 60 marks of Lab viva/ practical.

Lab sessions will be based on following topics:

1. EXCEL BASICS: Spreadsheet Basics, Data Formatting in Excel like colors, fonts, Bullets etc, Basic Sorting and Filtering, Creating, Editing, saving and Printing spreadsheets. Sorting Data by values, colors , etc. Filtering by numbers, text, values logical functions, colors, Using Filters to Sort Data, Using Auto filter, Creating a custom AutoFilter Advance Filtering Options.
2. BASIC FORMULAE: SUM,AVERAGE,COUNT,MAX,MINetc Text Function, Logical Functions, Date and Time Functions, Information Function, Database Functions, Math and Trigonometry Functions, Statistical Functions, Relative cell reference, Absolute cell reference
3. FUNDAMENTAL DATA ANALYSIS : Charts, Creating a chart, Formatting a chart, Adding Labels, Changing the chart type, Data source, Sorting Data by Color, Creating a custom format, Create a custom number format, Conditional Formatting, Creating Conditional Formatting, Editing Conditional Formatting, Adding Conditional Formatting, Deleting Conditional Formatting from the selected range.
4. POWERFUL DATA ANALYSIS – PivotTable, Create a PivotTable to analyze external data, Connect to a new external data source, Using the Field List option, PivotTables based on Multiple Tables, Adding Pivot table Report Fields, Refreshing Pivot table Reports, Changing the summary functions, Creating report filter page. What-IF Analysis, Goal Seek, Data Tables, Scenario Manager, Working with Macros, Display the developer Tab, Changing Macro security Settings, Recording and running a Macro.
5. TABLEAU: Choosing appropriate visual encodings – ordering of item, number of distinct value, structure of visualisation, positioning - placement and proximity, graphs and layouts, colors, size, text and typographic, shapes , lines.
6. User defined fields: Using predefined fields, calculating percentages, applying if-then logic, applying logical functions, showing totals and percentages, discretizing data, manipulating text.
7. Customization: Adding title and caption, font size and colours, adding various marks, adding reference lines, using presentation mode, adding annotation, adding drop-down selectors, search box selectors, slider selectors, creating dashboards, creating animated visualizations .

SAMPLE EXERCISE MICROSOFT EXCEL-

PRACTICAL EXERCISE 1

Use the worksheet given below to answer the questions that follow:

Employee Details						
Emp No	**Name**	**Category**	**Basic Pay**	**Allowances**	**Gross Pay**	**Tax Deductions**
E8	Cornell	Assistant	4,600	300		
E9	John	Assistant	3,500	450		
E2	Francis	Supervisor	6,508	500		
E3	Edwin	Management	8,006	1,801		
E10	Carl	Assistant	4,200	100		
E4	Bernard	Management	7,917	1,775		
E5	George	Supervisor	5,500	850		
E1	Lewis	Management	8,291	2,500		
E6	Albert	Supervisor	5,700	760		
E7	Edward	Supervisor	7,151	1,545		
Tax Rate						
12%						

Questions

(i). Make all the column titles bold, and size 12. Center the title , across columns A1:H1 and make it size 16, and Bold.
(ii). Calculate the gross pay in cell **F4**.
(iii). Calculate the amount of tax deducted from each employee, given that the tax rate is 12% of the gross pay. Tax rate is found in cell A16 of the worksheet.
(iv). Format the text orientation in the range **A4:G4** to 0 degrees.
(v). Adjust the column width such that all the headings are visible.
(vi). In cell **H4**, enter the title **Net Pay** and calculate the Net pay for all employees.
(vii). Format the range **G4:H13** to **zero** (0) decimal places.
(viii). Format the title **Net Pay** to match the other titles.
(ix). Set the range A1 to H16 as **Print Area**.
(x). Using the Names in column B, Basic Pay in column D, and Allowances in column E, insert a **Clustered Column Pie Chart** on the same sheet to show comparison of the salaries for the employees. The Chart Title should be **Employee Details**, the Y-axis should be **Employee Names** and the X-axis should be **Thousands (Kshs).**
(xi). Move the chart so that the top left corner is on cell A18.
(xii). Change the Chart Title to **Employees' Salary Details**.
(xiii). Change the Chart Type to **Clustered bar with a 3-D visual effect**.
(xiv). Increase the Chart Title **Font size to 14**.
(xv). Change the text direction for the title of the X-axis to 0 degrees, and for the Y-axis to -90 degrees.
(xvi). Resize the chart such that the bottom left corner is on cell A55, while the bottom right corner is on cell I55 so that all the details are clearly visible.
(xvii). Save the worksheet as **Salary Details (Reviewed Copy)**.

PRACTICAL EXERCISE 2

You are in charge of a young and growing business. You have identified the various factors (sources of revenue and expenses) that influence the business as shown in the table below. Use the figures provided and the layout to create a financial projection model for the business for the next six years. The parameters are given on Sheet 2.

SHEET 1:

INCOME AND EXPENSES PROJECTIONS						
	1999	**2000**	**2001**	**2002**	**2003**	**2004**
Sales	10,000					
% Growth over the previous year		20%	30%	20%	10%	10%
Materials						
Wages						
Other benefits						
Others						
Total Cost of Goods Sold						
Salary: Office						
Salary: Sales						
Other Benefits						
Advertising & Promotions						
Depreciation						
Miscellaneous						
Total General & Admin. Expenses						
Total Operating Costs						
Interest on Loans						
Pre-tax Income						
Tax						
Profit						

SHEET 2:

Parameters		**Description**
Sales	10,000	Starts at 10,000 and grows by a percentage
Materials	17%	17% of Sales
Wages	14%	14% of Sales
Other benefits	2.1%	2.1% of Sales
Others	8%	Starts at 100, then grows by 8% yearly
Salary: Office	10%	Starts at 1,000, then grows by 10% annually
Salary: Sales	8%	8% of Sales
Other Benefits	17%	17% of Total Salary
Advertising & Promotions	2.5%	2.5% of Sales
Depreciation	20	Fixed at 20 every year
Miscellaneous	10	Starts at 10 and grows by a fixed amount of 10 annually
Interest on Loans	10	A fixed amount of 10 each year
Tax	52%	52% of Pre-tax Income

Exercise Instructions.

(i). Open the worksheet named **Income and Expenses Projections.xls**.
(ii). Rename Sheet1 as **Projections** while Sheet 2 should now be **Parameters**.
(iii). Calculate the Sales for the year 2000 using the percentage given in cell **C5**.
(iv). Copy the formula across to the Year 2004.
(v). Calculate the different items that make up the Total Operating Costs using the parameters in the Parameters sheet.
(*You should enter the formula for the Year 1999 and copy down to the year 2004. Use Absolute Referencing effectively*).
Hint: *Total Cost of Goods Sold = Materials + Wages + Other Benefits + Others*
(vi). Calculate the Total Operating Costs:
Total Cost of Goods Sold + Total General and Administrative Expenses.
(vii). Calculate the Interest on Loans:
(viii). Calculate the Pre-tax Income.
Sales – Total Operating Cost – Interest on Loans.
(ix). Calculate the Tax.
(x). Calculate the Profit:
Pre-tax Income - Tax.
(xi). Format the worksheet as follows:
Make all the Totals bold, zero decimal places, comma, center the heading between A1:G1 and make it size 16, bold.
(xii). Save the file as **C:\Exams\Creative.xls**

SAMPLE EXERCISE TABLEAU

1. **Sales Representative and Calls Performance**
a) Make a visualization showing the total number of calls, separated by incoming and outgoing, for each sales representative (rep id).
b) Make a visualization showing which sales reps have the largest number of outgoing calls.
c) Make a visualization showing which sales reps handled the most calls (incoming and outgoing) at the time block starting at 2pm.
Make a dash board (DASHBOARD A) containing all three of these visualizations.

2**. Company Sales Branches Comparison**
Your CEO wants to have one chart that allows her to easily comprehend how many calls each branch of the company has, broken out by the type of call (call purpose). You are to make four visualizations to put in a dashboard (DASHBOARD B) to show your manager (one of which you'll end up showing the CEO). Describe which of the four you think is best and why and include it as an annotation on that visualization.
a) One focused on call purpose (Bar Chart, 3 groups: complaint, product support, sales support)
b) One organized by Branch (Bar Chart, 2 groups: north, south)
c) Call purpose Stacked Bar Chart (combining two branches into same stacked bar)
d) Branch focused Stacked Bar Chart (combining three call purposes into same stacked bar)

3. **Call Time and Sales Rep Filtering**
Display the number of calls each sales rep makes. Build a quick filter that controls which of these results are displayed based on the value of SUM(During Call Wait Time). Make the filter 10 (minutes) wide (you can set exact values by clicking on numbers). Now drag the filter (via mouse down in middle of bar) through the range of waiting minute values. Create a dashboard (DASHBOARD D) to record all the times that you can find where there are ONLY TWO sales reps matching the filter

condition and shown in the visualization (e.g. Cam and Xander both have 24 calls when During Call Wait Time minutes is between 65 and 75).