



**Dr. D. Y. Patil Educational Federation's
Dr. D. Y. Patil College of Engineering and Innovation**
APPROVED BY AICTE, RECOGNIZED BY GOVT. OF MAHARASHTRA,
AUTONOMOUS INSTITUTE AFFILIATED TO SAVITRIBAI PHULE PUNE UNIVERSITY
Accredited by NAAC with "A" Grade



DETAILED SYLLABUS

Open Elective – I
Common to all

BTech 4 YEAR UG COURSE

(Applicable for the batches admitted from AY 2025-2026 at FY)

Dr. D. Y. Patil College of Engineering & Innovation

Survey No. 27/A/1/2C, Varale Campus,
Near Talegaon Railway Station,
Tal. Maval, Dist. Pune 410 507,
Ph: 020 48522561, 565,566

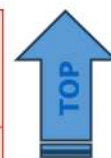
Web Site: <https://www.dypcoei.edu.in>,

Email: principal.dypcoei@dypatilef.com

Open Elective –I Common to all (Semester –III)

Open Elective -I (ILOEC2010)	
ILOEC2010-1	Engineering Economics
ILOEC2010-2	AI in Finance Management
ILOEC2010-3	Digital Finance
ILOEC2010-4	Financial Literacy

**Open Elective – I
Second Year Syllabus
(Semester –III)**



Second Year (2025 Course) Open Elective - I Engineering Economics			
Course Code	ILOEC2010-1	Credit	02
Contact Hours	02 Hrs/weeks (L)	Type of Course	Practical
Examination Scheme	TW: 25 Marks OR: 25 Marks	Total Marks	50

Pre-requisites: Basic Knowledge of Economics, General Awareness of Engineering Systems (recommended)

Course assessment methods/tools:

Sr. No.	Course assessment methods/tools	External/ Internal	Marks
1.	Term Work	Internal	25*
2.	Oral	External	25 [#]

Course Objectives

1	Introduce basic economic concepts relevant to engineering.
2	Develop understanding of cost, pricing, and economic decision-making.
3	Apply economic principles in engineering and industrial scenarios.
4	Understand management processes and production systems.

Course Outcomes

CO1	To Understand fundamental economic concepts and demand analysis.
CO2	To Apply cost concepts and break-even analysis in decision-making.
CO3	To Analyze and learn management principles and organizational structures.
CO4	To Evaluate planning techniques for plant location and layout.

Syllabus Contents**UNIT I – BASIC CONCEPTS (7 Hours)**

Basic economic concepts, Importance of economics in engineering, Economic and technical decision-making, Demand and supply analysis, Factors influencing demand, Elasticity of demand, Demand forecasting, Market structures and competition

UNIT II – COST AND PRICING (7 Hours)

Types of cost: Actual cost and opportunity cost, Marginal cost and incremental cost Sunk cost, Fixed and variable costs, Short-run and long-run cost analysis, Cost-output relationship, Pricing methods and price fixation, Break-even analysis

UNIT III – PROCESS OF MANAGEMENT (8 Hrs)

Nature and functions of management, Contributions of Taylor and Fayol, Principles of management, Types of organizations, Organization charts and manuals, Industrial ownership: types, formation, merits and demerits, Management by Objectives (MBO) Management by Exception (MBE), Introduction to Management Information System (MIS)

UNIT IV – PLANNING PRODUCTION TECHNIQUES AND ITS APPLICATION (8 Hrs)

Plant location: factors and decision-making, Plant layout: types, procedures, and techniques, Material handling: principles, equipment, and selection, Plant maintenance: objectives, types, and techniques, Production and productivity concepts, Economic growth and standard of living, Factors affecting productivity, Role of work study, Human factors in production, Method study: objectives and procedure, Charting techniques (including SIMO charts), Principles of motion economy

Text Books

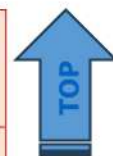
1. Varshney and Maheshwari, *Managerial Economics*
2. Dewett, *Modern Economic Theory*

Reference Books

1. L.M. Prasad, *Principles and Practice of Management*, Sultan Chand and Sons
2. V.P.S. Rao and P.S. Narayana, *Principles of Management*

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
C01	3	2	-	-	-	-	-	-	-	1	-
C02	3	3	2	2	-	-	-	-	-	1	2
C03	3	3	2	-	-	-	-	2	2	2	2
C04	3	3	3	3	2	-	-	-	-	2	3



Second Year (2025 Course) Open Elective - I AI in Finance Management			
Course Code	ILOEC201O-2	Credit	02
Contact Hours	02 Hrs/weeks (L)	Type of Course	PRACTICLE
Examination Scheme	TW: 25 Marks OR: 25 Marks	Total Marks	50

Pre-requisites: Basic Knowledge of Economics

Course assessment methods/tools:

Sr. No.	Course assessment methods/tools	External/ Internal	Marks
1.	Term Work	Internal	25*
2.	Oral	External	25 [#]

Course Objectives

1	Introduce the integration of Artificial Intelligence in financial management.
2	Develop understanding of AI-driven financial decision-making models.
3	Apply machine learning techniques to financial data analysis.
4	Analyze financial risks, forecasting, and investment strategies using AI tools.

Course Outcomes

CO1	To Understand fundamentals of AI and its applications in financial management.
CO2	To Apply AI techniques for financial forecasting and decision-making.
CO3	To Analyze and learn financial data using machine learning models.
CO4	To Evaluate investment, risk, and credit decisions using AI tools.

Course Contents

Unit I – Introduction to AI in Financial Management (07 Hours)

Overview of Artificial Intelligence in Finance, Role of AI in financial decision-making, Introduction to Machine Learning (ML), Deep Learning (DL), Applications: Banking, Insurance, Investment, FinTech, Data-driven financial systems

Case Study:

AI in stock market prediction

AI applications in digital banking

Unit II – AI for Financial Forecasting & Time Value Concepts (07 Hours)

Financial forecasting using AI models, Regression, Time Series Analysis (ARIMA, ML-based models), AI in Time Value of Money (TVM), Predictive analytics for investment decisions, AI-based capital budgeting (NPV, IRR with ML insights)

Case Study:

Stock price prediction using ML

Forecasting cash flows using AI tools

Unit III – Financial Data Analysis & Risk Management (08 Hours)

Financial data preprocessing and visualization, AI in financial statement analysis, Fraud detection using AI, Credit scoring models (AI-based), Risk analysis using ML algorithms

Case Study:

AI-based fraud detection in banking

Credit risk evaluation using machine learning

Unit IV – AI Applications in Working Capital & FinTech (08 Hours)

AI in working capital management, Smart inventory and receivable management, AI in portfolio management, Robo-advisors and algorithmic trading, Blockchain and AI in finance, AI-based cost of capital estimation (WACC using predictive models)

Case Study:

AI in fintech startups

Portfolio optimization using AI

Text Books

- I.M. Pandey, *Financial Management*

- Prasanna Chandra, *Financial Management*
- Financial Management by I.M. Pandey, Vikas Publishing House
- Financial Management by Rustagi R.P., Taxmann Publications

Reference Books

- Khan & Jain, *Financial Management*
- Van Horne, *Financial Management and Policy*
- Ross, Westerfield & Jordan, *Corporate Finance*
- Stuart Russell & Peter Norvig, *Artificial Intelligence: A Modern Approach*
- Yves Hilpisch, *Artificial Intelligence in Finance*
- Marcos López de Prado, *Advances in Financial Machine Learning*
- Kevin J. Murphy, *Machine Learning: A Probabilistic Perspective*

E-Books / Online Resources

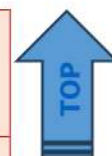
- Financial Management eBook by IIMBx (edX)
- AI in Finance courses on Coursera / edX

MOOC / SWAYAM / NPTEL

- Financial Management for Managers – NPTEL
- Basics of Financial Management – NPTEL
- Introduction to AI – NPTEL
- Machine Learning – NPTEL (IIT Madras / IIT Kharagpur)

CO-PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	-	-	2	-	-	-	-	1	-
CO2	3	3	2	2	3	-	-	-	-	1	2
CO3	3	3	3	3	3	-	-	-	-	2	2
CO4	3	3	3	3	3	1	-	-	-	2	3



Second Year (2025 Course) Open Elective- I Digital Finance			
Course Code	ILOEC2010-3	Credit	02
Contact Hours	TH: 02 Hrs./Weeks (L)	Type of Course	Lecture
Examination Scheme	TW: 25 Marks OR: 25 Marks	Total Marks	50

Pre-requisites: Basic Finance and Economics, and Cyber Security & Digital Payments

Course assessment methods/tools:

Sr. No.	Course assessment methods/ tools	External/ Internal	Marks
1.	Term Work	Internal	25*
2.	Oral	External	25 [#]

Course Objectives

1	The evolution of digital finance and the influence of big data on financial systems.
2	Digital payment ecosystems and ongoing transformations in digital banking.
3	Core concepts of blockchain, cryptocurrencies, and decentralized finance.
4	Applications of AI, machine learning, and analytics in financial services.

Course Outcomes

CO1	To Understand basics of digital finance, big data, and regulatory frameworks
CO2	To Analyze digital payments, FinTech trends, and neo-banking models.
CO3	To Illustrate blockchain, cryptocurrencies, and DeFi systems.
CO4	To Discuss and learn the role of AI/ML for financial analytics.

Topics covered:

Unit I: Digital Finance Fundamentals & Big Data (7 Hrs.)

Evolution & Fundamentals of Digital Finance: Evolution of digital finance and the shift from traditional to digital systems. Introduction to FinTech and technological transformations in financial services. Overview of regulatory frameworks and compliance in the digital era.

The Rise of Big Data in Finance: Role of big data in shaping financial decision-making and risk management. Leveraging data science for personalization and modern financial services.

Case Study: DBS Bank's Digital Transformation.

Unit II: Digital Payment Systems & Digital Banking Transformation (7Hrs)

Digital Payment Ecosystems: Historical evolution and digitalization of payment systems (ECS, RTGS, NEFT, IMPS, UPI, mobile wallets, contactless payments), Attributes of a well-functioning payment system and the role of banks.

Fintech Innovations & Disruption: FinTech startups, challenger banks, and peer-to-peer lending models, FinTech applications across banking, NBFCs, insurance, lending, audit, and compliance, Regulatory guidelines (e.g., RBI guidelines) and risks associated with new payment models. The Future of Digital Banking: How traditional banks are adapting and the rise of neo-banks, Digital banking trends and evolving customer expectations.

Case Study: Unified Payments Interface (UPI) in India.

Unit III: Blockchain, Cryptocurrencies & Decentralized Finance (8 Hrs.)

Blockchain Technology: Fundamentals of blockchain and underlying cryptographic techniques, Smart contracts and decentralized finance (DeFi) applications.

Cryptocurrencies & Digital Assets: Overview and evolution of cryptocurrencies (Bitcoin, Ethereum, etc.), Central Bank Digital Currencies (CBDCs) and other emerging digital assets. Advanced Applications & **Case Studies:** Impact of blockchain on payments, lending, and financial settlements, Real-world case studies and disruptive potential in global finance.

Case study: The Sand Dollar (Bahamas' CBDC)

Unit IV: Artificial Intelligence, Machine Learning & Financial Analytics (8 Hrs)

AI & Machine Learning in Finance: Predictive analytics in stock markets, trading, and algorithmic/high frequency trading, Credit risk analysis and automated decision-making using AI. **Data Analytics & Financial Applications:** Data sourcing, cleaning, processing, and visualization for financial data, Sentiment analysis and AI-driven portfolio management.

Practical Projects & Case Studies: Hands-on projects: building stock price prediction models, fraud detection systems, and credit score prediction models, Real-world applications in digital lending and wealth management

Case study: Thread programming Using Pthreads, POSIX

Text Books

1	C. Skinner, Digital Finance: Big Data, Startups, and the Future of Financial Services, 1st ed. Hoboken, NJ, USA: Wiley, 2016.
2	J. H. M. T. Jeffry, Introduction to FinTech, 1st ed. Noida, India: Pearson Publications, 2018
3	D. Tapscott and A. Tapscott, The Blockchain Revolution: How the Technology Behind Bitcoin and Other Cryptocurrencies is Changing the World, 1st ed. New York, NY, USA: Penguin Random House, 2016.
4	M. López de Prado, Machine Learning for Asset Managers, 1st ed. Cambridge, UK: Cambridge University Press, 2020.

Reference Books:

1	R. Ghose, Future Money: Fintech, AI and Web3. London, UK: Kogan Page, 2024.
2	Y. Hilpisch, Artificial Intelligence in Finance: A Python-Based Guide, 1st ed. Sebastopol, CA, USA: O'Reilly Media, 2020.
3	M. López de Prado, Advances in Financial Machine Learning, 1st ed. Hoboken, NJ, USA: Wiley, 2018.
4	S. Chishti and J. Barberis, The FINTECH Book: The Financial Technology Handbook for Investors, Entrepreneurs, and Visionaries, 1st ed. Hoboken, NJ, USA: Wiley, 2016.
5	D. Drescher, Blockchain Basics: A Non-Technical Introduction in 25 Steps, 1st ed. Berkeley, CA, USA: Apress, 2017.

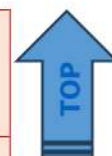
E-Books

1	P. H. Beaumont, Digital Finance: Big Data, Start-ups, and the Future of Financial Services, 1 st ed. London, U.K.: Routledge, 2019. Link:
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	https://download.e-bookshelf.de/download/0015/1963/23/L G-0015196323-0047264745.pdf
2	N. Urbach and M. Röglinger, Big Data and Artificial Intelligence in Digital Finance, 1st ed. Cham, Switzerland: Springer, 2022 Link: https://library.oapen.org/bitstream/id/fefe46c7-449549ba-bcab-9cf1851e81e6/978-3-030-94590-9.pdf

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CO2	3	3	2	2	3	-	-	-	1	2	2
CO3	3	3	3	3	3	-	-	-	1	2	2
CO4	3	3	3	3	3	1	-	-	2	2	3



Second Year (2025 Course) Open Elective- I Financial Literacy			
Course Code	ILOEC2010-4	Credit	02
Contact Hours	TH: 02 Hrs./Weeks (L)	Type of Course	Lecture
Examination Scheme	TW: 25 Marks OR: 25 Marks	Total Marks	50

Pre-requisites: Basic Finance and Economics, and Mutual Fund

Course assessment methods/tools:

Sr. No.	Course assessment methods/ tools	External/ Internal	Marks
1.	Term Work	Internal	25*
2.	Oral	External	25 [#]

Course Objectives

1	The evolution of digital finance and the influence on financial systems.
2	Digital payment ecosystems and ongoing transformations in Financial Planning.
3	Core concepts of Mutual fund foundation.
4	Applications of Engineering financial analytics in financial services.

Course Outcomes

CO1	To Understand basics of digital finance
CO2	To Analyze digital payments, financial planning
CO3	To Illustrate Mutual fund foundation
CO4	To Discuss and learn the role of Engineering financial analytics.

List of NISM Courses:

Sr. No.	Course Title	Duration (HH.MM.SS)	NISM Link
1	Financial Literacy course for Bharat	22.00.00	Open Course
2	Financial Planning (Basic)	05.00.00	Open Course
3	Mutual Fund Foundation	-	Open Course

CO-PO Mapping Table:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
C01	3	2	-	-	2	-	-	1	-	1	-
C02	3	3	2	2	3	-	-	-	1	2	2
C03	3	3	3	3	3	-	-	-	1	2	2
C04	3	3	3	3	3	1	-	-	2	2	3