

## Algorithmic Trading

***Responsible Faculty Instructor:***  
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Associate Professor

Credits: 4

Credits Type: Non-Law

Cross-registration: yes

Pre-requisites: no

COURSE DESCRIPTION (COURSE VISION): A key change which has taken place in the Indian capital market over the years has been the introduction of the programmed trading software replacing the manual trading strategies applied. This has been known to the world as algorithmic trading and has been accused of the financial catastrophies like black Monday in US in the equity markets. Many of the sudden and precipitous declines in equity markets too are being attributed to the algorithmic trading which has garnered a large proportion of derivatives trading in India. Recent recessions, bubbles, mortgage crises and regulations. The present course will foster the awareness and understanding of the trading landscape and basic terminology of stock markets and how these market function. We also focus on the technical and fundamental analysis which are heavily used by the stock market traders and investors. In the technical analysis, the students will learn about different kind of charts, chart patterns, Dow theory, trading strategies based on candlestick patterns, level of entry and exit, stop loss and profit booking, etc. In the fundamental analysis, we will discuss all kinds of ratios related to profitability, efficiency, liquidity, solvency, and valuation of the companies. This course will be a comprehensive package to learn the Indian stock market mechanism, technical analysis, and fundamental analysis. After learning the concepts in this course, the student will be able to invest in the share market confidently. There is no pre-requisite to be part of this course.

**Disclaimer:** This course is purely for educational purpose. Investments in equity market is subject to market risk, and you can lose your entire capital. Hence, take advise of your financial advisor before trading and investing in share market.

### TEACHING METHODOLOGY:

The course will be based on experiential learning by hands on training of trading in stock markets. Most of the sessions would be student-centred, with students encouraged to be more active in the classroom during discussions and real learning.

### INTENDED LEARNING OUTCOMES:

Course Intended Learning Outcomes	Weightage	Teaching and Learning Activities	Assessment Tasks/ Activities
By the end of the course, students should be able to:			
Discuss and debate on use of algorithms in stock market	20 %	1. In- class case discussion 2. Explaining concepts in details 3. Debates on stock markets topics	1. Class Participation 2. Research paper 3. Group presentation 4. Practical Exam
Apply technical and fundamental analysis to real financial markets.	50 %		
Analyse and identify right strategies of entry/exit for investment in any company.	20%		

READING LIST (upto 10 select readings):

1. Bodie, Z., Kane, A. & Marcus, A. J. (2017). *Investments*. New York: McGraw-Hill Education.
2. Gurman and Jochnk, *Fundamentals of Investing*, Pearworth
3. The Art and Science of Technical Analysis by Adam Grimes, John Wiley & Sons.
4. Neftci, S.N. *An introduction to the Mathematics of Financial Derivatives*. Academic Press.
5. *Beyond Greed and Fear: Understanding Behavioral Finance and the Psychology of Investing* by Hersh Shefrin
6. www.ncdex.com for details on commodity derivatives in India
7. www.nse-india.com for stock-based derivatives.

WEEKLY READING PLAN (WEEKLY OUTLINE):

A weekly plan is provided below:

MODULES	WEEK(S)
Understanding the stock market mechanism: <ul style="list-style-type: none"> <li>• Different asset classes (Debt, Gold, Equity, Cryptocurrency, etc.)</li> </ul>	1

<ul style="list-style-type: none"> <li>• Regulators (SEBI)</li> <li>• Exchanges (NSE and BSE)</li> <li>Brokers</li> <li>• Depository and Depository Participants</li> <li>• IPOs and FPOs</li> <li>• Settlement Cycles</li> <li>• Corporate actions and price changes</li> </ul>	
<p><b>Introduction to Algo Trading :</b> Understanding the basics of algorithmic trading, its evolution, and its impact on financial markets.</p>	2
<p>Fundamental Analysis (Quantitative and Qualitative analysis):</p> <ul style="list-style-type: none"> <li>• Ratio Analysis</li> <li>• Management of company</li> <li>• Corporate governance and awards</li> <li>• Related party transactions</li> <li>• DII/FII investments</li> <li>• Who are shareholders?</li> <li>• Political connections</li> </ul> <p style="text-align: center;">Promoters' history</p>	3-5
<p>Mastering Technical Analysis with</p> <ul style="list-style-type: none"> <li>• Live Trading Sessions:</li> <li>• Types of charts (Line chart, candlestick charts)</li> <li>• Chart patterns (Dow patterns)</li> <li>• Candlestick patterns</li> <li>• Moving averages and golden crossover</li> <li>• Support and Resistance</li> <li>• Trend Lines</li> </ul> <p style="text-align: center;">Indicators (RSI, Bollinger band, MACD, etc.)</p>	6-7
<p>Art of Scalping/Intraday trading with Live Trading Sessions:</p> <ul style="list-style-type: none"> <li>• Decide your trading setup</li> <li>• Deciding entry, exit and stoploss</li> <li>• Breakout trades</li> <li>• Reversal trades</li> <li>• Long trades and</li> <li>• Short trades</li> <li>• Paper trading</li> </ul> <p>(Virtual on Moneybhai.com)</p> <ul style="list-style-type: none"> <li>• Risk to Reward</li> </ul> <p>Ratio</p>	8
<p>Art of BTST and Swing trading with Live Trading Sessions:</p> <ul style="list-style-type: none"> <li>• Buy today sell tomorrow trades setup</li> </ul>	9

Swing trades setup	
<p>Art of Techno-Fundamental Trading:</p> <ul style="list-style-type: none"> <li>• Identifying quality stocks using screener website</li> <li>• Using Tradingview website effectively</li> <li>• Use futures and options trade data (moneycontrol.com)</li> </ul>	<b>10</b>
<p>Art of Mastering Trading Psychology with Live Trading Sessions:</p> <ul style="list-style-type: none"> <li>• Cognitive biases</li> <li>• Confirmation bias</li> <li>• Anchoring bias</li> <li>• Disposition effect</li> <li>• Fear of missing-out</li> <li>• Fear of being invested</li> </ul>	<b>11</b>
<p>Art of Risk Management with Live Trading Sessions:</p> <ul style="list-style-type: none"> <li>• Using Call Options</li> <li>• Using Put Options</li> </ul> <p>Using Futures Contracts</p>	<b>12</b>
<p>Algo Trading Strategies and vectorized back-testing on MS Excel:</p> <ul style="list-style-type: none"> <li>- Formulating strategies Using the Relative Strength Index</li> <li>- Formulating Strategies with Multiple Conditions</li> </ul> <p>Evaluating Performance of Strategies</p>	<b>13</b>
Presentation and Practical Exam	<b>14</b>
<b>REVISION WEEK</b>	<b>Week 15</b>