Department of Statistics
Haldia Government College

Organizes

VALUE ADDED COURSE

on

Financial Time Series Analysis by Artificial Neural Networks

Time schedule: 1st March, 2022 to 29th June, 2022, Every Tuesday and Friday 5 pm to 6 pm.

Course duration: 34 hours (Including lectures and practical)

Officer-in-charge
Haldia Government College
P.O.-Debhog, Dist.- Purba Medinipur

About the course:

The Department of Statistics has offered this value-added course to the undergraduate students with statistics background to provide knowledge in financial time series as well as neural computing. Financial time series has a huge scope in today's data driven market. Financial time series data has some different features compared to usual time series data. There is a huge challenge in analysing them. Neural computing is an emerging field in artificial intelligence. This course will explore the scope of analysing the different complex feature of financial time series data using some automated model building approach such as artificial neural networks. The purpose of the course is to provide students' knowledge regarding some of the issues in financial time series and neural computing.

Objectives:

- To aware the participants about financial time series and their different features
- To provide knowledge about different financial time series models
- To provide knowledge about neural computing
- To discuss the possibility of capturing the complexity of financial time series using automated modelling such as neural networks
- Real life financial data handling using artificial neural networks

Resource person: Tanmay Kumar Maity, Department of Statistics, Haldia Govt. College

Course Convener: Dr. Shyamsundar Sahoo, Head, Department of Statistics, Haldia Government College

Course Coordinator: Tanmay Kumar Maity, Department of Statistics, Haldia Govt. College

Eligibility: Undergraduate students with Statistics background

Registration Details: Registration is mandatory for all participants. There is no registration fee for the course.

Interested participants may submit the hard copy of the filled registration forms to

Tanmay Kumar Maity, Department of Statistics, Haldia Govt. College

Last date for enrolment: 28th February, 2022

Certificate will be given after Completion of Course

Value Added Course

in

Financial Time Series Analysis by Artificial Neural Networks

Organized by

Department of Statistics

Haldia Government College

Contents

Module 1: Financial Time Series **12 hours**

- Time Series and its components, Stationary vs Non-stationary time series, Autocorrelation, partial correlation and cross correlation functions.
- Financial Time series and its different features, graphical illustrations and identification of different features, model of mean: AR, MA, ARMA, Conditional heteroscedasticity, ARCH, GARCH, FIGARCH Model, Long memory time series.

Module 2: Artificial Neural Network **12 hours**

Concept of Artificial neurons, Neural Network, Feedforward backpropagation, Recurrent Neural Network, Neural networks for Time series data

Module 3: Analysis of Financial Time Series **10 hours**

- Preparation of data, Choosing the neural network model, Checking model diagnostics, Prediction accuracy
- Hands on with some real life data analysis

Reference/suggested books:

- Fundamentals of Artificial Neural Networks, M. H. Hassoun,
- Nonlinear Time Series Analysis By Neural Networks: A Case Study, H. Saxen, "Neural Networks for Pattern Recognition, Christopher M. Bishop
- The Analysis of Time Series: An Introduction, Chris Chatfield
- Analysis of Financial Time Series, Ruey S. Tsay

Officer-in-charge
Haldia Government College
P.O.-Debhog, Dist.- Purba Medinipur

Report on Value Added Course organized by Department of Statistics, Haldia Government College (Session: 2021-22)

Name of the course:

Financial Time Series Analysis by Artificial Neural Networks

Duration:

34 hours

Resource person:

Tanmay Kumar Maity, Dept. of Statistics

Organizing department:

Department of Statistics

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No of participants:

14

Course outcome:

- The participants have gained knowledge about different complex feature of financial time series. They also gain knowledge about the statistical modelling of financial time series. This will help them to understand the features of financial market.
- The knowledge about neural computing will help the participants to understand automated modelling. These type of automated financial forecasting can help them to understand financial market risk, investment, trading etc.

Tanmay Kumar Maity
Course Coordinator

Dr. Pijush Kanti Tripathi
Officer-in-Charge

Officer-in-charge
Haldia Government College
P.O. Debhog, Dist- Purba Medinipur

Add-on/ Value Added Course

on

Financial Time series Analysis by Artificial Neural Networks.

Organized by:

Department of Statistics

Haldia Government College

Academic Session: 2021-22

List of Participants

Sl. No.	Name	Regn. No.	College ID	Signature
1	Akash Das	1160393 of 2020-21	HGC/STSH/20/015	Akash Das
2	Bikash Gayen	1160416 of 2020-21	HGC/STSH/20/010	Bikash Gayen
3	Kousik Ghara	1160429 of 2020-21	HGC/STSH/20/008	Kousik Ghara
4	Nilanjan Samanta	1160448 of 2020-21	HGC/STSH/20/007	Nilanjan Samanta
5	Pratyay Mandal	1160457 of 2020-21	HGC/STSH/20/022	Pratyay Mandal
6	Raj Shekhar Das	1160461 of 2020-21	HGC/STSH/20/017	Raj Shekhar Das
7	Riddhiman Ghosh	1160464 of 2020-21	HGC/STSH/20/024	Riddhiman Ghosh
8	Sayak Kanti Jana	1160480 of 2020-21	HGC/STSH/20/018	Sayak Kanti Jana
9	Shatakshee Das	1160488 of 2020-21	HGC/STSH/20/027	Shatakshee
10	Snehashis Halder	1160497 of 2020-21	HGC/STSH/20/032	Snehashis Halder
11	Somnath Samanta	1160501 of 2020-21	HGC/STSH/20/020	Somnath Samanta
12	Sourav Jana	1160509 of 2020-21	HGC/STSH/20/012	Sourav Jana
13	Sudipta Mondal	1160519 of 2020-21	HGC/STSH/20/019	Sudipta Mondal
14	Swagato Karmakar	1160531 of 2020-21	HGC/STSH/20/029	Swagato Karmakar

Counter Signature

Officer-in-charge
Haldia Government College
P.O.-Debhog, Dist.- Purba Medinipur

Student Enrollment Form

Add-on/ Value Added Course

on

Financial Time Series Analysis by Artificial Neural Networks

Organized by:

Department of Statistics

Haldia Government College

Academic Session: 2021-22

1. **Name (Block Letters):** NILANJAN SAMANTA
2. **College ID.:** HGC/STSH/20/007
3. **University Registration No. with year:** 1160418 – 2020-21
4. **Department:** statistics
5. **Semester:** IV
6. **Address:** Vill- Kisherchak, P.O.- Namalbark, Ps- Kolaghat, Pin- 721171
7. **Contact No. (Whatsapp No.):** 8513931632
8. **Email id:** nilanjansamanta1210@gmail.com

Nilanjan Samanta

Signature of the applicant

For Department Use Only

Approved / Not approved

01/03/22

Course Coordinator

Student Enrollment Form

Add-on/ Value Added Course

on

Financial Time Series Analysis by Artificial Neural Networks

Organized by:

Department of Statistics

Haldia Government College

Academic Session: 2021-22

1. **Name (Block Letters):** RAJ SHEKHAR DAS
2. **College ID.:** HGIC/STSH/2017
3. **University Registration No. with year:** 160461 of 2020-2021
4. **Department:** STATISTICS
5. **Semester:** 4
6. **Address:** DEKHALI, DEKHALI, PURBA MEDINIPUR, 721430
7. **Contact No. (Whatsapp No.):** 9083037396
8. **Email id:** raj shekhar das rsd.2001@gmail.com

Raj Shekhar Das

Signature of the applicant

For Department Use Only

Approved / Not approved

Amity 07/03/22

Course Coordinator

Haldia Government College
Department of Statistics
Value Added Course in "Financial Time Series Analysis by Artificial Neural Networks" (2021-22)
Assessment

(7)

Marks: 10

Time: 15 min

Registration no. with year: 116053108 2020-21

College ID.: HGC/STSH/20/029

Tick the right answer: (Answer all questions)

1. The most commonly used mathematical method for measuring the trend is

A. Semi Average
B. Moving Average
C. Free Hand Curve
D. Least Squares

2. The augmented Dickey-Fuller unit root test can be used to test for

A. normality.
B. independence.
C. stationarity.
D. invertibility.

3. Which of the following processes is stationary?

A. An MA(1) process with $\theta = -1.4$
B. $Y_t = 12.3 + 1.1Y_{t-1} + e_t$
C. $Y_t = 12.3 + Y_{t-1} + e_t$
D. $Y_t = \beta_0 + \beta_1 t + e_t$

4. Which of the following conditions are necessary for a series to be classifiable as a weakly stationary process?

(i) It must have a constant mean (ii) It must have a constant variance (iii) It must have constant autocovariances for given lags (iv) It must have a constant probability distribution

A. (ii) and (iv) only
B. (i) and (iii) only
C. (i), (ii), and (iii) only
D. (i), (ii), (iii), and (iv)

5. What is back propagation?

A. it is the transmission of error back through the network to adjust the inputs
B. it is the transmission of error back through the network to allow weights to be adjusted so that the network can learn
C. it is another name given to the curvy function in the perceptron
D. None

6. The network that involves backward links from output to the input and hidden layers is called as

A. perceptron's
B. recurrent neural network
C. self-organizing maps
D. multi layered perceptron

7. In backpropagation chain rule is followed to determine

A. Number of Inputs
B. Number of Outputs
C. Gradients
D. Number of Intermediate Stages

8. Backpropagation algorithm is highly sensitive for?

A. Noisy Data
B. Data Irregularities
C. A & B
D. Noise less Data

9. Which is true for neural networks?

A. It has set of nodes and connections
B. Each node computes it's weighted input
C. Node could be in excited state or non-excited state
D. All of the mentioned

10. What is the basic concept of Recurrent Neural Network?

A. Use previous inputs to find the next output according to the training set.
B. Use a loop between inputs and outputs in order to achieve the better prediction.
C. Use recurrent features from dataset to find the best answers.
D. Use loops between the most important features to predict next output.

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Financial Time Series Analysis by Artificial Neural Networks

Academic Session: 2021-22

Grade sheet for Assessment

Sl. No.	Name	Regn. No.	College ID	Marks	Grade
1	Akash Das	1160393 of 2020-	HGC/STSH/20/015	07	A+
2	Bikash Gayen	1160416 of 2020-	HGC/STSH/20/010	07	A+
3	Kousik Ghara	1160429 of 2020-	HGC/STSH/20/008	07	A+
4	Nilanjan Samanta	1160448 of 2020-	HGC/STSH/20/007	07	A+
5	Pratyay Mandal	1160457 of 2020-	HGC/STSH/20/022	07	A+
6	Raj Shekhar Das	1160461 of 2020-	HGC/STSH/20/017	08	O
7	Riddhiman Ghosh	1160464 of 2020-	HGC/STSH/20/024	07	A+
8	Sayak Kanti Jana	1160480 of 2020-	HGC/STSH/20/018	07	A+
9	Shatakshee Das	1160488 of 2020-	HGC/STSH/20/027	07	A+
10	Snehashis Halder	1160497 of 2020-	HGC/STSH/20/032	07	A+
11	Somnath Samanta	1160501 of 2020-	HGC/STSH/20/020	08	O
12	Sourav Jana	1160509 of 2020-	HGC/STSH/20/012	06	A+
13	Sudipta Mondal	1160519 of 2020-	HGC/STSH/20/019	08	O
14	Swagato Karmakar	1160531 of 2020-	HGC/STSH/20/029	07	A+

8+ - Outstanding (O), 6-8 - A+, 5-6 - A, 4-5 - B, <4 - F

Course Coordinator

Officer-in-charge
Haldia Government College
P.O.-Debhog, Dist.- Purba Medinipur

No.: HGC/VAC/22/Stat/1/2

Date: 17.08.2022

Department of Statistics

Haldia Government College

CERTIFICATE OF COMPLETION

Value Added Course

on

Financial Time Series Analysis by Artificial Neural Networks

Bikash Gayen

This is to certify that Mr./Miss. .....

of .....**Statistics (Hons.)**..... and Semester .....**IV**.....has successfully completed Value Added Course on

.....***Financial Time Series Analysis by Artificial Neural Networks*** .....

organized by the **Department of Statistics**, Haldia Government College (Academic Session: 2021-22).

We wish him/her bright future.

Tanmay Kumar Maity
Course Coordinator

Dr. Shyamsundar Sahoo
Head of the Department

Dr. Pijush Kanti Tripathi
Officer-in-Charge

Value Added Course on Financial Time Series Analysis by Artificial Neural Networks

REGISTER OF ATTENDANCE OF PUPILS

FOR THE MONTH OF (March 22 to June, 22)

Serial No.	Roll No.	NAME OF PUPILS	Sl. No. & dt. of Adm in the Adm. Reg.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Present	Late Present	Absent on Leave	Absent without Leave	REMARKS
1.		Akash Das		p	p	p	.	p	p	p	.	p	p	.	.	p	p	p	p	p	p	p	.	.	.	p	p	p	p	p	p	.	.	p	p				
2.		Bikash Gayen		p	.	.	.	p	p	p	p	p	p	p	.	p	p	.	p	.	p	p	.	p	p	p	.	p	p	p	p	.	p	p	p				
3.		Kousik Ghara		p	.	p	p	p	p	p	p	p	.	.	p	p	p	.	p	.	p	p	p	p	p	p	p	p	p	p	.	p	p	p	p				
4.		Nilanjan Samanta		p	p	p	p	p	p	p	p	.	p	p	p	p	p	p	p	p	p	p	.	p	p	p	p	p	p	p	p	p	p	p	p				
5.		Pratyay Mondal		!	p	p	p	p	p	p	p	p	p	p	.	p	.	p	p	.	.	p	p	.	.	p	.	p	p	.	p	p	.	p	p				
6.		Raj Sekhar Das		p	p	.	p	p	p	p	p	p	p	.	p	p	p	p	.	p	p	p	p	p	.	p	p	p	p	p	.	.	p	p	p				
7.		Riddhiman Ghosh		.	.	p	.	p	p	.	p	p	p	.	p	p	p	p	.	p	.	p	.	p	.	.	.	p	p	p	.	p	p	.	p				
8.		Sayak Kanti Jana		p	p	.	p	p	p	p	p	p	p	.	p	p	.	p	.	p	.	p	p	.	p	p	p	.	.	.	p	p	p	p	p				
9.		Shatakshee Das		p	.	.	.	.	p	p	p	.	.	.	p	p	p	.	p	p	p	.	p	p	p	p	.	.	p	.	p	.	p	p	p				
10.		Snehasis Halder		p	p	p	.	.	p	p	.	p	p	.	p	p	.	p	.	p	p	.	p	.	p	p	.	.	p	.	p	p	.	p	p				
11.		Soumath Samanta		p	.	.	p	p	.	p	p	p	.	p	p	p	p	.	p	p	p	.	p	p	.	p	.	p	.	p	p	p	.	p	p				
12.		Sourav Jana		p	.	p	p	.	p	p	p	p	p	p	p	p	p	p	p	.	p	p	.	p	.	p	.	p	.	p	p	p	p	p	p				
13.		Sudipta Mondal		p	p	.	p	p	p	p	p	p	p	p	.	p	p	.	p	.	p	p	p	p	p	.	p	p	p	.	p	p	.	p	p				
14.		Swagato Karmakar		p	p	p	.	.	p	p	.	p	p	p	p	p	p	p	p	p	p	p	-	.	p	p	p	.	p	p	p	p	p	p	p				
		No. Present daily																																					
		No. Absent daily																																					
		TOTAL ...																																					

Counter Signature.
[signature] 27/07/2022

Officer-in-charge
Haldia Government College
P.O. Debhog, Dist- Purba Medinipur

[signature]

Hindus - Muslims - + Others -

No. of Free Students - No. of ½ Free Students -

No. of working days during the Month -
Average Daily Attendance -
Percentage of Attendance during the Month -