



Rayat Shikshan Sanstha's
Arts, Science and Commerce College, Mokhada
Dist. Palghar 401 604

Department of Mathematics
Short Term Course- USMS01 Certificate Course in Applied
Mathematics & Statistical Techniques
Board of Studies – 2020-2021

Sr. No.	Designation	Name of the person
1	Chairman	Dr. J. G. Jadhav (Principal)
2	Member	Prof. D. H. Arekar (Head of Mathematics Department)
3	Member	Prof. Mr. V. B. Jagzap. (Expert)
4	Member	Prof. P. K. Patil (Coordinator, Applied Mathematics & Statistical Techniques)
5	Member	Prof. D. H. Arekar (Chairman, Short Term Course Committee)

Minutes of the Meeting

Board of Studies meeting of the Short Term Course / Certificate Course in Applied Mathematics & Statistical Techniques was conducted on 05-12-2020 at 02.00 pm in the Online Mode via Zoom App. Above members was present in the meeting.


Following Points are discussed in this meeting.

1. Syllabus formation of Applied Mathematics & Statistical Techniques short term course.
2. Dissemination of work
3. Fee structure
4. Encouragement of Student


Place: ASC College, Mokhada

Date: 05/12/2020


Coordinator


Chairman
Short term Course Committee




Principal
Arts, Science & Com. College
Mokhada, Dist. Palghar

रयत शिक्षण संस्थेचे,
कला, विज्ञान व वाणिज्य महाविद्यालय, मोखाडा, जिल्हा. पालघर.

गणित विभाग

विद्यार्थी सूचना

दि. १०/११/२०२०

गणित विभागामार्फत घेण्यात येणाऱ्या शॉर्ट टर्म कोर्स “**Certificate Course in Applied Mathematics and Statistics**” मध्ये प्रवेश घेतलेल्या सर्व विद्यार्थ्यांना कळविण्यात येते कि, हा कोर्स दि: ०७/१२/२०२० पासून सुरु होत आहे. तरी, सर्व विद्यार्थ्यांनी वेळापत्रकानुसार Lecture व Practical साठी उपस्थित राहावे.



[Signature]
Head / विभागप्रमुख
Department of Mathematics / गणित विभाग

[Signature]
Principal
Arts, Science & Commerce, College
Mokhada, Dist. Palghar

Rayat Shikshan Sanstha's
Arts, Science and Commerce College Mokhada,
Dist. Palghar
Department of Mathematics
**Short term Course on Applied Mathematics and
Statistical Techniques**

Time Table 2020-21

Time	Monday	Tuesday	Friday	Saturday
09.00 to 10.00	P.K. Patil	P.K. Patil	D.H. Arekar	D.H. Arekar



Arekar

Head,
Department of Mathematics

Oniz
Principal
Arts, Science & Commerce, College
Mokhada, Dist. Palghar



Rayat Shikshan Sanstha's
Arts, Science and Commerce College, Mokhada Dist. Palghar
DEPARTMENT OF MATHEMATICS

Short Term Course
**"CERTIFICATE COURSE IN APPLIED MATHEMATICS AND
STATISTICAL TECHNIQUES"**

Duration : 3 Month

Course Co-ordinator : Mr. Patil P. K.

Hours : 60

INTRODUCTION :

Applied mathematics is a branch of Mathematics consist of mathematical methods by different fields like science, engineering, business, computer science and industry. The term applied mathematics also describes the professional speciality in which real life practical problems are solved by formulating & studying mathematical models.

Thus in this course student will be able to grasp some of the basic mathematical & numerical methods to formulate, analyse, study & solve various problems .

OBJECTIVES :

At the end of this short term course, student will be able to

- acquire a clear perspective of the nature & scope of applied mathematics and understanding of some mathematical concepts.
- enumerate roots of various complex equations which cannot be solved by regular formula based methods.
- evaluate tedious integrals and differential equations in the easiest way that are used in engineering and technology and many other fields.
- familiar to graph theory which has huge applications in of computer & various fields.
- use linear programming problems and probability which have wide applications in Statistics & stock market, etc.

SYLLABUS

↓ THEORY:

Sr. No.	Unit	Topic	Faculty	No. of Lectures
1.	Unit I	Graph Theory	Mr. Patil P. K.	08
2.	Unit II	Trees	Mr. Patil P. K.	08
3.	Unit III	Linear Programming Problem	Mr. Arekar D. H..	08
4.	Unit IV	Probability & Probability distribution	Mr. Arekar D. H..	08
5.	Unit V	Decision Theory	Mr. Arekar D. H..	08

○ Unit I : Graph Theory

Introduction, Application of graphs, Definition of graph, Types of Graph – Simple, Directed Graph, Terminology, Examples, Adjacency and Incidence matrix of a graph, Eulerian trail, Hamiltonian path. Distance in a graph- shortest path problems, Dijkstra's algorithm.

○ Unit II : Trees

Trees – Definition & Example, Spanning tree, Algorithms for spanning tree-BFS and DFS, Binary and m-ary tree, Binary trees – Minimum Spanning tree, Prim's algorithm, Kruskal's algorithm.

○ Unit III : Linear Programming Problem

Introduction, Terms in LPP, Formulation of LPP, Solution of LPP – Graphical method, Simplex method (Maximization problem)

○ Unit IV : Probability

Introduction, Definition of Probability & examples, Basic probability theory, Random variable – Discrete & continuous, Expectation, Variance, examples in probability distribution, Binomial Distribution

○ Unit V : Decision Theory

Decision making situation, Decision maker, Courses of Action, States of Nature, Pay-off and Pay-off matrix; Decision making under uncertainty, Maximin, Maximax, Minimax regret and Laplace criteria; examples to find optimum decision. Formulation of Payoff Matrix. Decision making under Risk, Expected Monetary Value (EMV);

↓ PRACTICAL:

Units	Topics	No. of Lectures
Unit I	Adjacency and Incidence matrix of a graph, Examples of Euler's trail/circuit, Hamiltonian path/ circuit	04
Unit II	BFS and DFS, Minimum spanning tree, Prim's algorithm, Kruskal's algorithm	04
Unit III	Formulation of LPP, Solution of LPP by Graphical method (Maximization & Minimization)	04
Unit IV	Examples of Probability, Expectation, Variance, examples in probability distribution	04
Unit V	Examples of Maximin, Maximax, Minimax regret and Laplace criteria, , EMV, EOL.	04

↓ Reference Books:

1. J. A. Bondy and U. S. R. Murty, Graph Theory with Applications, Elsevier
2. West D. G. Graph theory, Allyn and Bacon.
3. R. Brualdi, Introduction to Combinatorics, Pearson Education
4. H. A. Taha, Operations Research, Prentice Hall of India



5. Basic Probability Theory, Robert Ash, Dover Publication
6. Kenneth H. Rosen, Discrete Mathematics & its Applications, McGraw Hill Education

↓ **Question Paper Pattern :**

There will be Theory Examination of 60 Marks and Practical Examination of 40 Marks.

Theory Paper :-

- | | | |
|-----|--------------------------------------------|------------|
| Q.1 | 5 MCQ's | (10 Marks) |
| Q.2 | Attempt any 2 questions out of 4 Questions | (10 Marks) |
| Q.3 | Attempt any 2 questions out of 4 Questions | (10 Marks) |
| Q.4 | Attempt any 2 questions out of 4 Questions | (10 Marks) |
| Q.5 | Attempt any 2 questions out of 4 Questions | (10 Marks) |
| Q.6 | Attempt any 2 questions out of 4 Questions | (10 Marks) |

Practical Paper :-

Solve any 4 questions out of 7 questions (4x10 = 40 Marks)

↓ **Job Opportunities :**

1. Students can use this for the network analysis, study topology of networks in computer language as well as in operations research
2. Students can use it in the electrical circuit/network diagrams & problems.
3. For NET/SET Exam preparation

↓ **Board Of Studies :**

1. Dr. Jadhav J. G. (Princ.)
2. Mr. Arekar Dadasaheb H.
3. Mr. Patil Prashant K.

Dr. J. G. Jadhav
Mr. D. H. Arekar
Mr. P. K. Patil



Rayat Shikshan Sanstha's
Arts, Science & Commerce College, Mokhada

Dist. Palghar - 401 604.
 Department of Mathematics
 Short term Course 2020-21



**“Certificate course in Applied Mathematics and Statistical
 Techniques”**
 Student Enroll List

Sr. No.	Name of the Student	Class
1.	Bodhere Pradip Sadashiv	T. Y. B. Sc.
2.	Bhoye Premkumar Chima	T. Y. B. Sc.
3.	Burange Vishal Bharat	T. Y. B. Sc.
4.	Gadage Pankaj Ganapat	T. Y. B. Sc.
5.	Gangad Bhaskar Waman	T. Y. B. Sc.
6.	Govind Naresh Pandu	T. Y. B. Sc.
7.	/Maniyar Shifa Salim	T. Y. B. Sc.
8.	Mengal Avinash Shivram	T. Y. B. Sc.
9.	Palwe Dipak Jayram	T. Y. B. Sc.
10	/Patil Rupali Ashok	T. Y. B. Sc.
11	Rathad Vishal Vilas	T. Y. B. Sc.
12	Shid Sampat Kalu	T. Y. B. Sc.
13	/Yele Kirti Somnath	T. Y. B. Sc.

Prati
 co-ordinator

Zeekar
 Head / विभागप्रमुख
 Department of Mathematics / गणित विभाग

Omkar
 PRINCIPAL
 Arts, Science & Com. College
 Mokhada, Dist. Palghar



Rayat Shikshan Sanstha's
Arts, Science & Commerce College, Mokhada Dist. Palghar - 401 604.

Department of Mathematics
Short term Course 2020-21

"Certificate course in Applied Mathematics and Statistical Techniques"
Theory Attendance



Sr. No.	Roll Number	Name of the Student	07/12/2021	10/12/2021	11/12/2021	13/12/2021	14/12/2021	17/12/2021	18/12/2021	09/01/22	04/01/22	07/01/22	10/01/22	11/01/22	17/01/22	18/01/22	21/01/22
1.	1811	Bodhere Pradip Sadashiv	Pradip	Pradip		Pradip	Pradip	Pradip	Pradip		Pradip	Pradip		Pradip		Pradip	Pradip
2.	1812	Bhoye Premkumar Chima	Premkumar			Premkumar	Premkumar		Premkumar		Premkumar			Premkumar		Premkumar	Premkumar
3.	1813	Burange Vishal Bharat	Vishal	Vishal		Vishal	Vishal	Vishal		Vishal	Vishal	Vishal	Vishal		Vishal		Vishal
4.	1814	Gadage Pankaj Ganapat	Pankaj		Pankaj	Pankaj	Pankaj		Pankaj		Pankaj	Pankaj	Pankaj		Pankaj	Pankaj	Pankaj
5.	1815	Gangad Bhaskar Waman	Bhaskar		Bhaskar			Bhaskar				Bhaskar	Bhaskar	Bhaskar		Bhaskar	Bhaskar
6.	1816	Govind Naresh Pandu	Govind	Govind		Govind			Govind	Govind	Govind			Govind		Govind	Govind
7.	1817	/Maniyar Shifa Salim	Shifa	Shifa	Shifa		Shifa		Shifa	Shifa	Shifa			Shifa	Shifa	Shifa	Shifa
8.	1818	Mengal Avinash Shivram	Avinash		Avinash	Avinash		Avinash	Avinash	Avinash			Avinash			Avinash	Avinash
9.	1819	Palwe Dipak Jayram		Dipak		Dipak			Dipak			Dipak			Dipak		Dipak
10.	1820	/Patil Rupali Ashok	Rupali		Rupali			Rupali	Rupali				Rupali	Rupali		Rupali	Rupali
11.	1821	Rathad Vishal Vilas	Vishal	Vishal	Vishal		Vishal	Vishal		Vishal	Vishal	Vishal		Vishal		Vishal	Vishal
12.	1822	Shid Sampat Kalu	Sampat			Sampat			Sampat			Sampat		Sampat		Sampat	Sampat
13.	1823	/Yele Kirti Somnath	Kirti	Kirti		Kirti	Kirti	Kirti	Kirti		Kirti		Kirti	Kirti		Kirti	Kirti

Patil
Course Co-ordinator

Dekar
Subject teacher

[Signature]
Principal
Arts, Science & Commerce College
Mokhada, Dist. Palghar

Rayat Shikshan Sanstha's
Arts, Science & Commerce College, Mokhada Dist. Palghar - 401 604.
 Department of Mathematics
 Short term Course 2020-21



“Certificate course in Applied Mathematics and Statistical Techniques”
Theory Attendance

Sr. No.	Roll Number	Name of the Student	04/02/22	07/02/22	08/02/22	11/02/22	18/02/22	21/02/22	22/02/22	25/02/22	01/03/22	07/03/22	08/03/22	14/03/22	15/03/22	21/03/22	22/03/22
1.	1811	Bodhere Pradip Sadashiv	Pradip		Pradip	Pradip		Pradip	Pradip		Pradip	Pradip	Pradip		Pradip		Pradip
2.	1812	Bhoye Premkumar Chima	Premkumar		Premkumar			Premkumar			Premkumar			Premkumar			
3.	1813	Burange Vishal Bharat	Vishal	Vishal	Vishal	Vishal			Vishal		Vishal	Vishal	Vishal		Vishal	Vishal	Vishal
4.	1814	Gadage Pankaj Ganapat	Pankaj	Pankaj		Pankaj	Pankaj		Pankaj	Pankaj		Pankaj	Pankaj		Pankaj	Pankaj	Pankaj
5.	1815	Gangad Bhaskar Waman		Bhaskar			Bhaskar		Bhaskar		Bhaskar	Bhaskar			Bhaskar	Bhaskar	Bhaskar
6.	1816	Govind Naresh Pandu		Naresh	Naresh	Naresh			Naresh		Naresh	Naresh		Naresh		Naresh	Naresh
7.	1817	/Maniyar Shifa Salim	Shifa		Shifa	Shifa			Shifa		Shifa	Shifa	Shifa		Shifa	Shifa	Shifa
8.	1818	Mengal Avinash Shivram	Avinash	Avinash			Avinash	Avinash	Avinash		Avinash	Avinash			Avinash	Avinash	Avinash
9.	1819	Palwe Dipak Jayram	Dipak			Dipak			Dipak	Dipak		Dipak		Dipak		Dipak	Dipak
10.	1820	/Patil Rupali Ashok	Rupali		Rupali	Rupali			Rupali		Rupali			Rupali		Rupali	Rupali
11.	1821	Rathad Vishal Vilas	Vishal	Vishal		Vishal	Vishal		Vishal	Vishal		Vishal	Vishal	Vishal	Vishal	Vishal	Vishal
12.	1822	Shid Sampat Kalu	Sampat		Sampat		Sampat	Sampat			Sampat	Sampat	Sampat	Sampat		Sampat	
13.	1823	/Yele Kirti Somnath	Kirti	Kirti	Kirti			Kirti	Kirti	Kirti		Kirti		Kirti	Kirti	Kirti	Kirti

Pradip
 Course Co-ordinator

Teekar
 Subject teacher

Principal
 Principal
 Arts, Science & Commerce, College
 Mokhada, Dist. Palghar

रयत शिक्षण संस्थेचे,

कला, विज्ञान व वाणिज्य महाविद्यालय, मोखाडा, जिल्हा. पालघर.

गणित विभाग

विद्यार्थी सूचना

दि. ०१/०४/२०२१

टी.वाय.बी.एस्सी गणित विषयाच्या सर्व विद्यार्थ्यांना सूचित करण्यात येते कि, गणित विभागामार्फत घेण्यात येणाऱ्या शॉर्ट टर्म कोर्स “**Certificate Course in Applied Mathematics and Statistics**” ची परीक्षा शनिवार दि : ०३/०४/२०२१ रोजी दुपारी १२:०० वाजता हॉल क्र.१ मध्ये घेण्यात येणार आहे. तरी, सर्व विद्यार्थ्यांनी परीक्षेसाठी वेळेवर उपस्थित रहावे.



Iskar
Head / विभागप्रमुख
Department of Mathematics / गणित विभाग

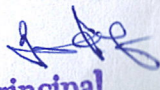
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Principal
Arts, Science & Commerce, College
Mokhada, Dist. Palghar



Rayat Shikshan Sanstha's
Arts, Science and Commerce College Mokhada,
Dist. Palghar
Department of Mathematics
Short term Course on Applied Mathematics and
Statistical Techniques
Result

Sr.No.	Name of the Student	Theory	Practical	Total
1	BODHERE PRADIP SADASHIV	50	30	80
2	BHOYE PREMKUMAR CHIMA	40	32	72
3	BURANGE VISHAL BHARAT	48	30	78
4	GADAGE PANKAJ GANAPAT	52	34	86
5	GANGAD BHASKAR WAMAN	52	28	80
6	GOVIND NARESH PANDU	50	30	80
7	MANIYAR SHIFA SALIM	48	24	72
8	MENGAL AVINASH SHIVRAM	52	32	84
9	PALWE DIPAK JAYRAM	52	34	86
10	PATIL RUPALI ASHOK	54	32	86
11	RATHAD VISHAL VILAS	54	30	84
12	SHID SAMPAT KALU	40	28	68
13	YELE KIRTI SOMNATH	48	34	82



Course Co-ordinator

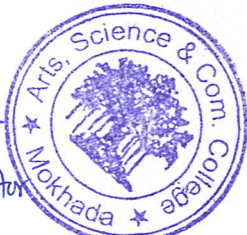

Principal
Arts, Science & Commerce, College
Mokhada, Dist. Palghar


Rayat Shikshan Sanstha's
Arts, Science and Commerce College Mokhada, Dist. Palghar
Department of Mathematics
**Short term Course on Applied Mathematics and
Statistical Techniques**


Report 2020-21

The short-term course entitled “**Applied Mathematics and Statistical Techniques**” was carried out by department of Mathematics. Total 13 students were enrolled this course. During these course various techniques related to Applied Mathematics were taught to the students. All students have passed in the examination and successfully completed this course.


Course Coordinator




Head,
Department of Mathematics


Principal
Arts, Science & Commerce, College
Mokhada, Dist. Palghar



Rayat Shikshan Sanstha's

Arts, Science and Commerce College, Mokhada,

Tal: Mokhada, Dist: Palghar-401604

Short Term Course on

“Applied Mathematics and Statistical Techniques”

Certificate

This is to certify that Mr./ Mrs./ Miss. Gadage Pankaj Ganapat of T.Y.B.Sc Mathematics has successfully completed short term course entitled “**Applied Mathematics and Statistical Techniques**” during Year 2020 -2021 conducted by Department of Mathematics ASC. College, Mokhada.

Askar

Head, Dept. of Mathematics



Omka

Principal

Arts, Science & Com. College
Mokhada, Dist. Palghar



Rayat Shikshan Sanstha's

Arts, Science and Commerce College, Mokhada,

Tal: Mokhada, Dist: Palghar-401604

Short Term Course on

“Applied Mathematics and Statistical Techniques”

Certificate

This is to certify that Mr./ Mrs./ Miss. Gangad Bhaskar Waman of T.Y.B.Sc Mathematics has successfully completed short term course entitled “**Applied Mathematics and Statistical Techniques**” during Year 2020 -2021 conducted by Department of Mathematics ASC. College, Mokhada.

Aekar

Head, Dept. of Mathematics



Dhile

Principal
Arts, Science & Com. College
Mokhada, Dist. Palghar



Rayat Shikshan Sanstha's

Arts, Science and Commerce College, Mokhada,

Tal: Mokhada, Dist: Palghar-401604

Short Term Course on

“Applied Mathematics and Statistical Techniques”

Certificate

This is to certify that Mr./ Mrs./ Miss. Burange Vishal Bharat of T.Y.B.Sc Mathematics has successfully completed short term course entitled “**Applied Mathematics and Statistical Techniques**” during Year 2020 -2021 conducted by Department of Mathematics ASC. College, Mokhada.

Ashtekar

Head, Dept. of Mathematics



Onkar

Principal
Arts, Science & Com. College
Mokhada, Dist. Palghar



Rayat Shikshan Sanstha's

Arts, Science and Commerce College, Mokhada,

Tal: Mokhada, Dist: Palghar-401604

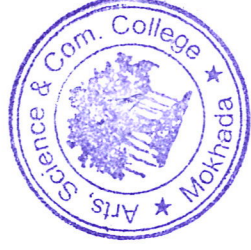
Short Term Course on

“Applied Mathematics and Statistical Techniques”

Certificate

This is to certify that Mr./ Mrs./ Miss. Bodhere Pradip Sadashiv of T.Y.B.Sc Mathematics has successfully completed short term course entitled “**Applied Mathematics and Statistical Techniques**” during Year 2020 -2021 conducted by Department of Mathematics ASC. College, Mokhada.

Head, Dept. of Mathematics



Pr. Principal
Arts, Science & Com. College
Mokhada, Dist. Palghar



Rayat Shikshan Sanstha's

Arts, Science and Commerce College, Mokhada,

Tal: Mokhada, Dist: Palghar-401604

Short Term Course on

“Applied Mathematics and Statistical Techniques”

Certificate

This is to certify that Mr./ Mrs./ Miss. Bhoye Premkumar Chima of T.Y.B.Sc Mathematics has successfully completed short term course entitled “**Applied Mathematics and Statistical Techniques**” during Year 2020 -2021 conducted by Department of Mathematics ASC. College, Mokhada.

Bekar

Head, Dept. of Mathematics



P. Mohr.

P. Principal

Arts, Science & Com. College
Mokhada, Dist. Palghar