

# University of Rajasthan Jaipur

## SYLLABUS

(Three/ Four Year Under Graduate Programme in Science)

II and IV Semester

2024-25

  
Dy. Registrar  
(Academic)  
University of Rajasthan  
JAIPUR

As per NEP-2020

# University of Rajasthan

## Department of Economics

**Programme Name: UG802/803-Three/Four Year B.Sc.**

The Programme is divided into four parts and each part will consist of two semesters.

| Part     | Year        | Odd Semester | Even Semester |
|----------|-------------|--------------|---------------|
| Part-I   | First Year  | Semester-I   | Semester-II   |
| Part-II  | Second Year | Semester-III | Semester-IV   |
| Part-III | Third Year  | Semester-V   | Semester-VI   |
| Part-IV  | Fourth Year | Semester-VII | Semester-VIII |

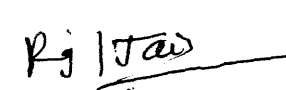
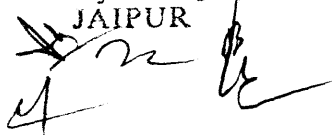
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Name of University: University of Rajasthan, Jaipur

Name of Faculty: UG0802/803 -B.Sc.

Name of Discipline: Economics

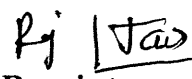
Programme Prerequisites: Passed 12<sup>th</sup> Class

  
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### Programme Specific Outcomes (PSOs)

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1. PSO1: Students will be introduced to contemporary economic issues and challenges at both national and global levels, promoting a practical understanding of the discipline's relevance. Graduates will understand the basic economic issues and problems of the real world, enabling them to analyze and address these challenges effectively.
2. PSO2: Students will be able to take informed actions by identifying the assumptions that frame our thinking and actions. They will assess the accuracy and validity of these assumptions and view ideas and decisions from intellectual, organizational, and personal perspectives.
3. PSO3: Students will learn the mathematical and statistical techniques essential for understanding economics. They will be trained to collect primary data and understand appropriate policy responses to economic problems.
4. PSO4: Students will gain insights into the dynamics of economic development, including the roles of financial inclusion, sustainable development initiatives, and government policies.
5. PSO5: The programme equips students with the flexibility to prepare for careers in academia, law, management, journalism, government, and many other fields, providing a broad range of opportunities.

  
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## Scheme of Examination for the Session 2024-2025

### Scheme of the Examination for Practical subjects:

#### **1 Credit=25 marks for examination/evaluation**

Continuous assessment, in which sessional work and the terminal examination will contribute to the final grade. Each course in Semester Grade Point Average (SGPA) has two components- Continuous assessment (20% Weightage) and (End of Semester Examination) EoSE (80% weightage)

1. Sessional work will consist of class tests, mid-semester examination(s), homework assignments, etc., as determined by the faculty in charge of the courses of study.
2. Each Paper of EoSE shall carry 80% of the total marks of the course/subject. The EoSE will be of 3 hours duration.

Part-A of the paper shall have multiple questions of equal marks. This first question shall be based on knowledge, understanding and applications of the topics/texts covered in the syllabus.

Part-B of the paper shall consist of 4 questions with an internal choice of each. The four questions will be set with one from each of the units with internal choice. Third to fourth questions shall be based on applications of the topics/texts covered in the syllabus (60% Weightage) and shall involve solving Problems (40% Weightage) if applicable.

3. 75% Attendance is mandatory for appearing in EoSE.
4. To appear in the EoSE examination of a course/subject student must appear in the midsemester examination and obtain at least a "C" grade in the course/subject.
5. Credit points in a Course/Subject will be assigned only if, the student obtains at least a C grade in midterm and EoSE examination of a Course/Subject.

### Scheme of the Examination for Non-Practical subjects:

#### **1 Credit=25 marks for examination/evaluation**

Continuous assessment, in which sessional work and the terminal examination will contribute to the final grade. Each course in Semester Grade Point Average (SGPA) has two components- Continuous assessment (20% Weightage) and (End of Semester Examination) EoSE (80% weightage)

6. Sessional work will consist of class tests, mid-semester examination(s), homework assignments, etc., as determined by the faculty in charge of the courses of study.

7. Each Paper of EoSE shall carry 80% of the total marks of the course/subject. The EoSE will be of 3 hours duration.

Part-A of the paper shall have multiple questions of equal marks. This first question shall be based on knowledge, understanding and applications of the topics/texts covered in the syllabus.

Part-B of the paper shall consist of 2 questions with an internal choice of each. The questions will be set with one from each of the units with internal choice. Third to fourth questions shall be based on applications of the topics/texts covered in the syllabus (60% Weightage) and shall involve solving Problems (40% Weightage) if applicable.

Part-C of the paper shall consist of 4 questions with an internal choice of each. The four questions will be set with one from each of the units with internal choice. Third to fourth questions shall be based on applications of the topics/texts covered in the syllabus (60% Weightage) and shall involve solving Problems (40% Weightage) if applicable.

8. 75% Attendance is mandatory for appearing in EoSE.

9. To appear in the EoSE examination of a course/subject student must appear in the midsemester examination and obtain at least a "C" grade in the course/subject.

10. Credit points in a Course/Subject will be assigned only if, the student obtains at least a C grade in midterm and EoSE examination of a Course/Subject.

### **Contact Hours 15 Weeks per Semester**

|                                       |                           |
|---------------------------------------|---------------------------|
| L — Lecture:                          | (1 Credit = 1 Hour/Week)  |
| T — Tutorial:                         | (1 Credit = 1 Hour/Week)  |
| S — Seminar:                          | (1 Credit = 2 Hours/Week) |
| P — Practical/Practicum:              | (1 Credit = 2 Hours/Week) |
| F — Field Practice/Projects:          | (1 Credit = 2 Hours/Week) |
| SA — Studio Activities:               | (1 Credit = 2 Hours/Week) |
| I — Internship:                       | (1 Credit = 2 Hours/Week) |
| C — Community Engagement and Service: | (1 Credit = 2 Hours/Week) |

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### Exit and Entrance Policy

1. Students who opt to exit after completion of the first year and have secured 48 credits will be awarded a UG Certificate if, in addition, they complete one internship of 4 credits during the summer vacation of the first year. These students are allowed to re-enter the degree programme within three years and complete the degree programme within the stipulated maximum period of seven years.
2. Students who opt to exit after completion of the second year and have secured 96 credits will be awarded the UG diploma if, in addition, they complete one internship of 4 credits during the summer vacation of the second year. These students are allowed to re-enter within a period of three years and complete the degree programme within the maximum period of seven years.
3. Students who wish to undergo a 3-year UG programme will be awarded UG Degree in the Major discipline after successful completion of three years, securing 150 credits and satisfying the minimum credit requirement.
4. A four-year UG Honours degree in the major discipline will be awarded to those who complete a four-year degree programme with 200 credits and have satisfied the minimum credit requirements.
5. Students who secure 75% marks and above in the first six semesters and wish to undertake research at the undergraduate level can choose a research stream in the fourth year. They should do a research project or dissertation under the guidance of a faculty member of the University/College. The research project/dissertation will be in the major discipline. The students, who secure 200 credits, including 12 credits from a research project/dissertation, are awarded UG Degree (Honours with Research).

#### Letter Grades and Grade Points

| Letter Grade      | Grade Point | Marks Range (%) |
|-------------------|-------------|-----------------|
| O (outstanding)   | 10          | 91-100          |
| A+ (Excellent)    | 9           | 81-90           |
| A (Very good)     | 8           | 71-80           |
| B+ (Good)         | 7           | 61-70           |
| B (Above average) | 6           | 51-60           |
| C (Average)       | 5           | 40-50           |
| P (Pass)          | 4           |                 |
| F (Fail)          | 0           |                 |
| Ab (Absent)       | 0           |                 |

| Name of Programme: UG0802/803: B.Sc. |       |          |         |                                                                             |         |   |   |       |
|--------------------------------------|-------|----------|---------|-----------------------------------------------------------------------------|---------|---|---|-------|
| Subject/ Discipline: Economics       |       |          |         |                                                                             |         |   |   |       |
| S No                                 | Level | Semester | Type    | Title                                                                       | CREDITS |   |   |       |
|                                      |       |          |         |                                                                             | L       | T | P | Total |
| 1                                    | 5     | II       | MJR/MIN | UG 802/803-ECO-52T-102:<br>Fundamental Methods of<br>Mathematical Economics | 6       | 0 | 0 | 6     |
| 2                                    | 6     | IV       | MJR/MIN | UG802/803-ECO-64T-202:<br>Statistics                                        | 6       | 0 | 0 | 6     |

When student take audit courses, they may be given a pass (P) or fail (F) grade without any credit.

### SEMESTER WISE PAPER TITLES WITH DETAILS

#### Syllabus

UG802/803--B.Sc.

#### Semester-II: Economics

| Type   | Paper Code and<br>Nomenclature                                                | Duration of<br>Examination | Maximum Marks<br>Midterm (MT)+ End of<br>Sem (ES) | Minimum Marks<br>Midterm (MT)+<br>End of Sem (ES) |
|--------|-------------------------------------------------------------------------------|----------------------------|---------------------------------------------------|---------------------------------------------------|
| Theory | UG 802/803-- ECO-52T-102:<br>Fundamental Methods of<br>Mathematical Economics | 1 Hrs-MT<br>3Hrs- ES       | 30 Marks- MT<br>120 Marks- ES                     | 12 Marks-MT<br>48 Marks- ES                       |

| Semester                    | II                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Code of the Course          | UG0802/803- ECO-52T-102                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Title of the Course/Paper   | Fundamental Methods of Mathematical Economics                                                                                                                                                                                                                                                                                                                                                                                                            |
| NHEQF Level                 | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Credit                      | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Level of the Course         | Introductory                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Type of the Course          | Major/Minor                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Delivery Type of the Course | Lectures                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Objective of the Course     | Equip students with essential mathematical tools and techniques to analyze and solve economic problems, train them to perform quantitative analysis of economic data and interpret results accurately, and illustrate the application of mathematics in both microeconomics and macroeconomics, thereby enhancing their understanding of these fields. It aims to equip students with optimization techniques and their applications in economic theory. |

## Course Outcomes

CO1: Students will gain a comprehensive understanding of matrices and vectors, including matrix operations such as addition and multiplication, and their basic principles like commutative, associative, and distributive laws.

CO1: Students will understand the first and second order conditions for finding maxima, minima, and saddle points in unconstrained optimization problems involving two choice variables, and will learn to assess the concavity and convexity of functions.

CO3: Students will grasp the concept of integration, both indefinite and definite integrals, and will apply these concepts in economic contexts to calculate consumer surplus and producer surplus.

CO4: Students will apply difference equations to economic models such as growth models, the Cobweb model, and the lagged Keynesian macroeconomic model.

## Syllabus

### UG0802/803- ECO-52T-102: Fundamental Methods of Mathematical Economics

#### Unit-I

Matrix and Determinants: Matrices and Vectors, Matrix Operations; Basic principles of Matrix addition and Multiplication, commutative, associative and distributive laws. Type of Matrices and their properties, Determinants- second-order and third order determinant, relation between Minors and Cofactors; Basic properties of Determinants; the Transpose of a Matrix, the Cofactor Matrix, Adjoint of a Matrix, Inverse of a Matrix. Solution of linear simultaneous equations by Matrix Inversion method and Cramer's rule.

(20 Lectures)

#### Unit-II

Unconstrained Optimization-The case of two choice variables: First order and second order conditions for a maxima, minima and saddle point solutions; conditions for concavity and convexity of a function; relevant applications.

Constrained Optimization (Lagrange Multiplier Method) - case of two choice variables: First order and second order conditions: (25 Lectures)

#### Unit-III

Integral Calculus: Concept of Integration; Indefinite and Definite Integrals and its application in Economics -Consumer surplus and Producer surplus.

(20 Lectures)

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## Unit-IV

Difference Equations: Solution of First and Second order homogeneous and non-homogeneous difference equations; Applications on Growth Model, A Cobweb Model, the lagged Keynesian macroeconomic model.

(25 Lectures)

### Books Recommended:

1. Alpha C. Chiang and Kevin Wainwright, Fundamental Methods of Mathematical Economics, Fourth Edition, Mc Graw Hill International Edition, 2005.
2. Geoff, Renshaw, Mathematics for Economics, Oxford University Press, 2011.
3. Jaques, I, Mathematics for Economics and Business, Prentice Hall, 2010.
4. Knut Sydsaeter and Peter J. Hammond, Mathematics for Economic Analysis, Low Price Edition, Pearson Education, New Delhi, 2007.
5. Mehta B.C. and G.M.K. Madnani, Mathematics for Economics, Sultan chand & Sons, New Delhi, 2008.
6. Teresa Bradley and Paul Patton, Essential Mathematics for Economics and Business, Wiley, 2000.

## Syllabus UG 802/803--B.Sc. Semester-IV: Economics

| Type   | Paper Code and Nomenclature      | Duration of Examination | Maximum Marks<br>Midterm (MT)+ End of Sem (ES) | Minimum Marks<br>Midterm (MT)+ End of Sem (ES) |
|--------|----------------------------------|-------------------------|------------------------------------------------|------------------------------------------------|
| Theory | UG802/803--ECO-64T-202Statistics | 1 Hrs-MT<br>3Hrs- ES    | 30 Marks- MT<br>120 Marks- ES                  | 12 Marks-MT<br>48 Marks- ES                    |

| Semester                    | IV                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Code of the Course          | UG802/803- -ECO-64T-202                                                                                                                                                                                                                                                                                                                                                    |
| Title of the Course/Paper   | Statistics                                                                                                                                                                                                                                                                                                                                                                 |
| NHEQF Level                 | 6                                                                                                                                                                                                                                                                                                                                                                          |
| Credit                      | 6                                                                                                                                                                                                                                                                                                                                                                          |
| Level of the Course         | Introductory                                                                                                                                                                                                                                                                                                                                                               |
| Type of the Course          | Major/Minor                                                                                                                                                                                                                                                                                                                                                                |
| Delivery Type of the Course | Lectures                                                                                                                                                                                                                                                                                                                                                                   |
| Objective of the Course     | This course aims to equip students with both theoretical knowledge and practical skills necessary to analyze and interpret data effectively. The objective of this course is to impart basic concepts of statistics essential for studying socio-economic problems with a particular focus on data collection techniques, classification, tabulation and analysis of data. |

### Course Outcome

CO1: Students will apply foundational statistical methods to analyze economic data, including techniques for data collection, tabulation, and graphical representation, thereby gaining practical skills in handling real-world datasets.

CO2: Students will learn about the relationships between variables using correlation techniques like Pearson's and Spearman's coefficients, and analyze trends in economic data through regression analysis and time series analysis, enhancing their ability to interpret statistical findings.

CO3: To Apply statistical techniques to analyze data from various fields such as business, economic, social sciences, and natural sciences.

CO4: Students will assess statistical significance through hypothesis testing, understanding concepts such as degrees of freedom, levels of significance, and types of errors, enabling them to make informed decisions based on rigorous statistical inference in economic research.

### Syllabus

UG802/803--ECO-64T-202: Statistics

#### Unit-I

Statistics- Nature and Uses. Methods of data collection and tabulation. Diagrammatic and Graphical representation of data. Measures of Central Tendency: Arithmetic Mean, Geometric Mean. Harmonic Mean. Mode. Median and Partition Values. (25 Lectures)

#### Unit -II

Concept and Measures of Dispersion, Skewness. Simple Correlation: Karl Pearson's Coefficient of Correlation and Spearman's Rank Correlation. Regression analysis, fitting of linear regression lines using Least Square Method. (25 Lectures)

#### Unit -III

Analysis of Time Series, Components, Determination of trend by straight line trend equation. Index Numbers: Laspeyres's, Paasche's, Fisher's Ideal Index Number, Splicing, Deflating. Interpolation (Binomial Expansion and Newton's Method). Association of Attributes. (20 Lectures)

#### Unit -IV

Elementary Probability Theory, Testing of Hypothesis: Concepts of Degree of Freedom, Level of Significance, Critical Region, Type I and II error, Standard error, t test. (20 Lectures)

#### Books recommended:

1. S.P. Gupta. Statistical Methods, Sultan Chand Sons, New Delhi.
2. M.R. Spiegel. Theory and Problems of Statistics, McGraw Hill Books, London.
3. S.C. Gupta and V.K. Kapoor. Fundamentals of Applied Statistics, S Chand and sons, New Delhi.
4. Salvator, D. Mathematics and Statistics, Schaum's Series, Tata McGraw Hill.
5. G. S. Monga. Mathematics and statistics for Economics, Vikas Publishing House, New Delhi.
6. K. N. Nagar. Fundamentals of Statistics, Meenakshi Prakashan, Meerut.