महर्षि दयानन्द सरस्वती विश्वविद्यालय, अजमेर
MAHARSHI DAYANAND SARASWATI UNIVERSITY, AJMER
NAAC Accredited 'B++' Grade State University

Syllabus of B.Sc. Mathematics Semester – III & Semester – IV

Session: 2024 – 2025

Scheme of Examination

1- **The teaching and examination of Under Graduate Part-II will be on semester basis (Semester – III & Semester – IV).**
2- **The Student/Faculty are advised to consider the content of the syllabus only for teaching and examination of all Under Graduate Part-II courses.**
3- **The scheme of the examination for each External Course examination in all Under Graduate Part-III semester scheme will be as follow:-**

"Scheme of examination for end of semester examination applicable to all undergraduate courses (Pass course as well as Honours course).

The question paper of semester Exam for the discipline specific core courses (DSC), Discipline specific elective (DSE), Ability Enhancement Course (AEC), Value Added Course (VAC) and Skill Enhancement Course (SEC) will be of 70 marks and it will be divided in two parts i.e. Part A and Part-B. Part-A will consist of 10 compulsory questions. There will be at least three questions from each unit and answer to each question shall be limited upto 50 words. Each question will carry two marks. Total 20 Marks.

Part-B will consist of 10 questions. Atleast three questions from each unit be set and student will have to answer five question, selecting atleast one question from each unit. The answer to each question shall be limited to 400 words. Each question carries 10 Marks. Total 50 Marks.

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NAAC Accredited 'B++' Grade State University

B.Sc. Mathematics Syllabus

Diploma Course (2024 – 2025)

Semester – III and IV (Mathematics)

Total Credit = 12 + *04 (*If SEC taken from Mathematics*)

Semester – III

Major (Discipline Specific Core Course-DSCC) - 4 + Practical – 2 + SEC – 2 = 06 + 02* Credit

Scheme of Credit & Marks	Paper, Practical, SEC
Discipline Specific Core Course – 4 Credit *Marks: 100 (Theory -70 + Internal -30)*	*Mathematical Theory*
Practical – 2 Credit *Marks: 50*	*Algorithm & Flow Chart on Numerical Methods*
**Skill Enhancement Course – 2 Credit*	*Scientific Calculator*

Semester – IV

Major (Discipline Specific Core Course-DSCC) - 4 + Practical – 2 + SEC – 2 = 06 + 02* Credit

Scheme of Credit & Marks	Paper, Practical, SEC
Discipline Specific Core Course – 4 Credit *Marks: 100 (Theory -70 + Internal -30)*	*Differential Equations*
Practical – 2 Credit *Marks: 50*	*Algorithm & Flow Chart on Equations*
**Skill Enhancement Course – 2 Credit*	*Scientific Calculator*

***SEC can be taken from any one subject like Mathematics, Physics, Chemistry**.

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NAAC Accredited 'B++' Grade State University

B.Sc. Mathematics Syllabus

Diploma Course (2024 – 2025)

Semester – III **Mathematics** **Credit – 4**

Theory and Tutorial: 4 Classes/Week/Hour (Total 60 Hours per Semester) of Paper of 4 Credits.
One Paper of 100 Marks (External-70 Marks + Internal – 30 Marks)

Mathematical Theory **Max. Marks: 70**

Unit-I Group Theory:

Definition of group, general properties of group, order of element of a group, cyclic group, permutation group, subgroup, cosets, normal subgroup and quotient group.

(हिन्दी अनुवाद)

समूह की परिभाषा, समूह के सामान्य गुणधर्म, समूह के अवयव की कोटि, चक्रीय समूह, क्रमचय, उपसमूह, सहसमुच्चय , प्रसामान्य उपसमूह तथा विभाग समूह |

Unit-II Ring Theory:

Ring, integral domain, field and their properties with examples. subring, subfield, prime field, ideals and their properties.

(हिन्दी अनुवाद)

वलय, पूर्णाकीय प्रान्त, क्षेत्र और उनके उदाहरण सहित गुणधर्म, उपवलय, उपक्षेत्र, अभाज्य क्षेत्र, गुणजावलिया एवं इनके गुणधर्म |

Unit-III Numerical Theory:

Difference operator, Newton's formulae for equal intervals, divided difference, Newton's and Lagrange's formulae for unequal intervals, central difference formula, Gauss, Bessel and Stirling interpolation formulae, Numerical differentiation.

(हिन्दी अनुवाद)

अन्तर संकारक, समान अन्तराल के न्यूटन सूत्र, विभाजित अन्तर, असमान अन्तराल के न्यूटन तथा लंग्राज सूत्र, केन्द्रीय अन्तर सूत्र, गॉस, बेसल एवं स्टिलरिंग अंतर्वेशन सूत्र, संख्यात्मक अवकलन |

Internal Assessment **Max Marks: 30**

Three objective test conduct by Department of Mathematics at College level after completing each Unit.

I test from I Unit containing 10 Objective questions of 10 Marks

II test from II Unit containing 10 Objective questions of 10 Marks

III test from III Unit containing 10 Objective questions of 10 Marks

*Records of test is maintained by college and internal marks obtained by students are submitted to University before semester examination start.

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B.Sc. Mathematics Syllabus

Diploma Course (2024 – 2025)

Semester – III **Mathematics (Practical)** **Credit– 2**

Theory and Tutorial: 2 Classes/Week/Hour (Total 30 Hours per Semester) of paper of 2 Credits.

Algorithm and Flow Chart on Numerical Methods Max Marks-50

Out of six practicals, select one from first three and one from last three for practical exam.

1. *Draw Algorithm and Flow Chart of Newton equal interval for Interpolation.*
2. *Draw Algorithm and Flow Chart of Newton unequal interval for Interpolation.*
3. *Draw Algorithm and Flow Chart of Lagranges unequal interval for Interpolation.*
4. *Draw Algorithm and Flow Chart of Gauss formula for Interpolation.*
5. *Draw Algorithm and Flow Chart of Besel formula for Interpolation.*
6. *Draw Algorithm and Flow Chart of Stirling formula for Interpolation.*

The marks distributions in practical exam is as follows:

- Practical exercise 1 Marks- 15
- Practical exercise 2 Marks - 15
- Viva-Voce Marks – 05
- Practical Record (Internal) Marks – 15

Total: Marks – 50

Semester – III **Mathematics (*Skill Enhancement Course)** **Credit– 2**

Theory and Tutorial: 2 Classes/Week/Hour (Total 30 Hours per Semester) of paper of 2 Credits.

Scientific Calculator Max Marks-50

Uses of scientific calculator for teaching and learning mathematics in interdisciplinary subjects as skill enhancement course.

*** Scientific Calculator is allowed in Exam**.

Describe the procedure of scientific calculator to evaluate the following: The value of log x for different x, the antilogarithmic value, the value of e^x for different x, the value of trigonometric function, the value of inverse trigonometric function, the different functional values in degree and radian and conversion also.

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NAAC Accredited 'B++' Grade State University

B.Sc. Mathematics Syllabus

Diploma Course (2024 – 2025)

Semester – IV **Mathematics** **Credit – 4**

Theory and Tutorial: 4 Classes/Week/Hour (Total 60 Hours per Semester) of Paper of 4 Credits.
One Paper of 100 Marks (External-70 Marks + Internal – 30 Marks)

Differential Equations **Max. Marks: 70**

Unit-I Differential Equation:

Order and degree of differential equation, differential equation of first order, first and higher degree, linear differential equation, homogeneous differential equation, linear differential equation with constant coefficients, linear differential equation of second order, method of variation of parameters.

(हिन्दी अनुवाद)

अवकल समीकरण की कोटि एव घात, प्रथम कोटि, प्रथम एवं उच्च घात की अवकल समीकरण, रैखीय अवकल समीकरण, समघात अवकल समीकरण, अचर गुणांको सहित रैखीय अवकल समीकरण, द्वितीय कोटि की रैखीय अवकल समीकरण, प्राचल वितरण विधि |

Unit-II Partial Differential Equation:

Partial differential equation of the first order, Lagrange's solution, Charpit method, Partial differential equation of second and higher order.

(हिन्दी अनुवाद)

प्रथम कोटि की आंशिक अवकल समीकरण, लंग्राज हल, चारपिट विधि, द्वितीय व् उच्च कोटि की आंशिक अवकल समीकरण |

Unit-III Numerical Algebraic Equation:

Numerical integration, Trapezoidal, Simpson's, Weddle rule. Bisection, Regula falsi, Newton Raphson method for solution of algebraic and transcendental equations.

(हिन्दी अनुवाद)

संख्यात्मक समाकलन, ट्रेपिजोइडल, सिम्फसन, वेड्ल नियम, बीजीय एवं अबीजीय समीकरण के लिए द्विभाजन , रेगुला फाल्सी, न्यूटन राफ्सन विधि, |

Internal Assessment **Max Marks: 30**

Three objective test conduct by Department of Mathematics at College level after completing each Unit.

I test from I Unit containing 10 Objective questions of 10 Marks

II test from II Unit containing 10 Objective questions of 10 Marks

III test from III Unit containing 10 Objective questions of 10 Marks

*Records of test is maintained by college and internal marks obtained by students are submitted to University before semester examination start.

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B.Sc. Mathematics Syllabus
Diploma Course (2024 – 2025)

Semester – IV **Mathematics (Practical)** **Credit– 2**

Theory and Tutorial: 2 Classes/Week/Hour (Total 30 Hours per Semester) of paper of 2 Credits.

Algorithm and Flow Chart on Numerical Equations Max Marks-50

Out of six practicals, select one from first three and one from last three for practical exam.

1. *Draw Algorithm and Flow Chart of* Trapezoidal Rule.
2. *Draw Algorithm and Flow Chart of* Simpson's Rule.
3. *Draw Algorithm and Flow Chart of* Weddle Rule.
4. *Draw Algorithm and Flow Chart of* Bisection Method.
5. *Draw Algorithm and Flow Chart of* Regula Falsi Method.
6. *Draw Algorithm and Flow Chart of* Newton Raphson method.

The marks distributions in practical exam is as follows:

- Practical exercise 1 Marks- 15
- Practical exercise 2 Marks - 15
- Viva-Voce Marks – 05
- Practical Record (Internal) Marks – 15

Total: Marks – 50

Semester – IV **Mathematics (*Skill Enhancement Course)** **Credit– 2**

Theory and Tutorial: 2 Classes/Week/Hour (Total 30 Hours per Semester) of paper of 2 Credits.

Scientific Calculator Max Marks-50

Uses of scientific calculator for teaching and learning mathematics in interdisciplinary subjects as skill enhancement course.

*** Scientific Calculator is allowed in Exam**.

Describe the procedure of scientific calculator to evaluate the following: The value of hyperbolic functions, the value of different algebraic polynomial up to degree 4 and up to four unknown, the value of n^{th} root of the number, the value of a factorial, the value of Determinant, the multiplication of two Matrix.

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NAAC Accredited 'B++' Grade State University

Syllabus of B.Sc. Mathematics Semester – V & Semester – VI

Session: 2025 – 2026

Scheme of Examination

1- **The teaching and examination of Under Graduate Part-III will be on semester basis (Semester – V & Semester –VI).**
2- **The Student/Faculty are advised to consider the content of the syllabus only for teaching and examination of all Under Graduate Part-III courses.**
3- **The scheme of the examination for each External Course examination in all Under Graduate Part-III (V & VI semester) scheme will be as follow:-**

"Scheme of examination for end of semester examination applicable to all undergraduate courses (Pass course as well as Honours course).

The question paper of semester Exam for the discipline specific core courses (DSC), Discipline specific elective (DSE), Ability Enhancement Course (AEC), Value Added Course (VAC) and Skill Enhancement Course (SEC) will be of 70 marks and it will be divided in two parts i.e. Part A and Part-B. Part-A will consist of 10 compulsory questions. There will be at least three questions from each unit and answer to each question shall be limited upto 50 words. Each question will carry two marks. Total 20 Marks.

Part-B will consist of 10 questions. Atleast three questions from each unit be set and student will have to answer five question, selecting atleast one question from each unit. The answer to each question shall be limited to 400 words. Each question carries 10 Marks. Total 50 Marks.

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NAAC Accredited 'B++' Grade State University

B.Sc. Mathematics Syllabus

Degree Course (2025 – 2026)

Semester – V and VI (Mathematics)

Total Credit = 12 + *04 (If SEC taken from Mathematics*)**

Semester – V

Major (Discipline Specific Elective-DSE) - 4 + Practical – 2 + SEC – 2 = 06 + 02* Credit

Scheme of Credit & Marks	Paper (DSE), Practical, SEC
Discipline Specific Elective – 4 Credit *Marks: 100 (Theory -70 + Internal -30)*	***Elective any one out of three**:* *1. Real Analysis* *2. Complex Analysis* *3. Mathematical Statistics*
Practical – 2 Credit *Marks: 50*	*MOOCs on Selected DSE Paper with Practical*
**Skill Enhancement Course – 2 Credit* *Marks: 50*	*Use of MS Excel in Statistics*

Semester – VI

Major (Discipline Specific Elective-DSE) - 4 + Practical – 2 + SEC – 2 = 06 + 02* Credit

Scheme of Credit & Marks	Paper (DSE), Practical, SEC
Discipline Specific Elective – 4 Credit *Marks: 100 (Theory -70 + Internal -30)*	***Elective any one out of three**:* *1. Statics* *2. Dynamics* *3. Linear Programming and Optimization Techniques*
Practical – 2 Credit *Marks: 50*	*MOOCs on Selected DSE Paper with Practical*
**Skill Enhancement Course – 2 Credit* *Marks: 50*	*Use of MS Excel in Linear Programming*

****SEC can be taken from any one subject like Mathematics, Physics, Chemistry**.*

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NAAC Accredited 'B++' Grade State University

B.Sc. Mathematics Syllabus

Degree Course (2025 – 2026)

Semester – V **Mathematics** **Credit – 4**

Theory and Tutorial: 4 Classes/Week/Hour (Total 60 Hours per Semester) of Paper of 4 Credits. One Paper of 100 Marks (External-70 Marks + Internal – 30 Marks)

DSE-1: Real Analysis (वास्तविक विश्लेषण) **Max. Marks: 70**

Unit-I : Real number system as a complete ordered field, The point set theory, ε-δ definition of the limit of a function, basic properties of limits, continuous functions and classification of discontinuities, sequential continuity, properties of continuous functions defined on closed intervals, limit and continuity of functions of two variables.

पूर्ण क्रमिंत क्षेत्र के रूप में वास्तविक संख्या निकाय, बिन्दु समुच्चय सिद्धान्त, फलन की सीमा की ε-δ परिभाषा, सीमाओं के मूल गुण, सांतत्यता फलन तथा असंतता का वर्गीकरण, अनुक्रम संततता, संवृत अन्तरालों पर परिभाषित संतत् फलनों के प्रगुण, दो चरों के फलनों की सीमा तथा सांतत्यता।

Unit-II : Differentiability and its properties, mean value theorems and their geometrical interpretation, Darboux's intermediate value theorem for derivatives, Taylor's theorem for functions of two variables, Definition of a sequence, theorems on limits of sequences, bounded and monotonic sequences, Cauchy's convergence criterion.

अवकलनीयता तथा इसके प्रगुण, मध्यमान प्रमेय तथा उनके ज्यामितीय अर्थ, अवकलजों के लिए डार्बू का मध्यमान प्रमेय, दो चरों वाले फलन का टेलर प्रमेय, अनुक्रम की परिभाषा अनुक्रम की सीमा के प्रमेय, परिबद्ध तथा एकदिष्ट अनुक्रम, कोशी के अभिसरण की कसौटी।

Unit-III : Infinite series of non-negative terms and its convergence, different tests of convergence of infinite series (without proof), Fourier series, Fourier expansion of piecewise monotonic functions, uniform convergence of series of functions. Wirestrass M-test. Abel's test and Dirichlet's test.

ऋणेत्तर पद वाली अनन्त श्रेणियां उनकी अभिसारिता, अनन्त श्रेणी की अभिसारित हेतु विभिन्न परीक्षण (बिना प्रमाण), फुरिये श्रेणी, अशतः एक दिष्ट फलनों का फूरिये प्रसरण, फलनों की श्रेणी का एक समान अभिसरण, वाइएस्ट्रार्स–M परीक्षण, अबेल परीक्षण डिरिरव्ले परीक्षण।

Internal Assessment **Max Marks: 30**

Three objective test conduct by Department of Mathematics at College level after completing each Unit.

I test from I Unit containing 10 Objective questions of 10 Marks

II test from II Unit containing 10 Objective questions of 10 Marks

III test from III Unit containing 10 Objective questions of 10 Marks

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NAAC Accredited 'B++' Grade State University

B.Sc. Mathematics Syllabus

Degree Course (2025 – 2026)

Semester – V **Mathematics** **Credit – 4**

Theory and Tutorial: 4 Classes/Week/Hour (Total 60 Hours per Semester) of Paper of 4 Credits.
One Paper of 100 Marks (External-70 Marks + Internal – 30 Marks)

DSE-2: Complex Analysis (सम्मिश्र विश्लेषण) **Max. Marks: 70**

Unit-I : Complex numbers as ordered pairs, curves and region in the complex plane, extended complex plane and stereographic projection, complex valued functions, limit and continuity, convergence, differentiability in the extended plane, analytic functions, Cauchy-Riemann equations, complex equation of a straight line and circle, polynomials, multiple valued functions, harmonic functions.

क्रमित युग्म के रूप में सम्मिश्र संख्याऐं, सम्मिश्र तल में वक्र तथा क्षेत्र, विस्तारित सम्मिश्र तल तथा त्रिविम प्रक्षेप, सम्मिश्र मानों के फलन, विस्तारित तल में सीमा, सांतत्यता, अभिसरण, अवकलनीयता, विश्लेशिक फलन, कॉशी रीमान समीकरण, सरल रेखा एवं वृत के सम्मिश्र समीकरण, बहुपद, बहुमानीय फलन, प्रंसवादी फलन।

Unit-II : Mapping or transformations, Jacobian of a transformation, conformal mapping, necessary and sufficient conditions for w=f(z) to represent conformal mapping, some elementary transformations, bilinear transformation and its properties.

प्रतिचित्रण या रूपान्तरण, रूपान्तरण का जेकोवियन, अनुकोण प्रतिचित्रण, w=f(z) के अनुकोण प्रतिचित्रण के निरूपण के लिए आवश्यक एवं पर्याप्त प्रतिबन्ध, कुछ प्रारम्भिक रूपान्तरण, द्विरेखीय रूपान्तरण एवं इसके गुणधर्म।

Unit-III : Sequences and series of functions, Power series, Complex line integral, reduction of complex integrals to real integrals, properties of complex integrals, Cauchy's fundamental theorem, Cauchy's integral formula, derivative of an analytic function, Morera's theorem, Liouville's theorem, Poisson's integral formula, expansion of analytic functions as power series, Taylor's and Laurent's theorems.

फलनों की अनुक्रम एवं श्रेणी, घात श्रेणी, सम्मिश्र रेखा समाकल, सम्मिश्र समाकलनों का वास्तविक समाकलनों में परिवर्तन, सम्मिश्र समाकलनों के गुणधर्म, कौशी की मूलभूत प्रमेय, कौशी समाकलन सूत्र, विश्लेषिक फलनों का अवकलज, मोरेरा प्रमेय, ल्यूविलेय का प्रमेय, पॉयसा का समाकल सूत्र, विश्लेषिक फलनों का घात श्रेणी में विस्तार, टेलर व ल्यूरेन्ट प्रमेय।

Internal Assessment **Max Marks: 30**

Three objective test conduct by Department of Mathematics at College level after completing each Unit.

I test from I Unit containing 10 Objective questions of 10 Marks

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III test from III Unit containing 10 Objective questions of 10 Marks

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NAAC Accredited 'B++' Grade State University

B.Sc. Mathematics Syllabus

Degree Course (2025 – 2026)

Semester – V **Mathematics** **Credit – 4**

Theory and Tutorial: 4 Classes/Week/Hour (Total 60 Hours per Semester) of Paper of 4 Credits.
One Paper of 100 Marks (External-70 Marks + Internal – 30 Marks)

DSE-3: Mathematical Statistics (गणितीय सांख्यिकी) **Max. Marks: 70**

Unit-I : Measures of dispersion, moments, central moments, skewness, kurtosis, Pearson's coefficients, probability, law of total and compound probability. conditional probability, independent events. Bay's theorem, random variable. probability distribution of a discrete random variable, mathematical expectation, expectation and variance of a linear combination of random variables, moment generating of function, cumulates and its properties.

विक्षेपण का माप, आघूर्ण, केन्द्रीय आचूर्ण, वैषम्य, ककुदता, पिर्यसन गुणांक, प्रायिकता, सम्पूर्ण तथा मिश्र प्रायिकता के नियम, सशर्त प्रायिकता, स्वतंत्र घटना, बेज प्रमेय, यादृच्छिक चर, विविक्त यादृच्छिक चर को प्रायिकता बंटन, गणितीय प्रत्याशा, यादृच्छिक चरों के रेखिक संयोजन की प्रत्याशा तथा विचरण, फलनों के आघूर्ण जनक, संचयी तथा इसके गुणधर्म।

Unit-II Discrete distributions: Binomial and Poisson, properties of these distributions and moments up to fourth order, fittings of Binomial and Poisson distributions. Continuous distributions: Rectangular and normal distributions, properties of these distribution and moments up to fourth order.

अंसतत प्रायिकता बंटन: द्विपद और प्वासों बंटन, इस बंटनों के गुणधर्म और प्रथम चार आघूर्ण, द्विपद व प्वासों बंटन का समजन। संतत प्रायिकता बंटन: आयतीय व प्रसामान्य बंटन, इसके गुणधर्म और प्रथम चार आघूर्ण ।

Unit-III : Bivariate data, Scattered diagram, Correlation coefficient, rank correlation coefficient, Principal of least square, Fitting of a line and quadratic curves, simple linear regression correlation, correlation versus regression, properties of regression coefficients.

द्विचर आंकड़े, प्रकीर्ण आलेख, सहसम्यन्ध गुणांक, कोटी सहसम्यन्ध गुणांक, न्यूनतम वर्ग का सिद्धान्त, रेखा और द्विधातीय वक्रो का समजन, सरल रैखिक समाश्रयण सहसम्बंध, सहसंबंध विरूद्ध समाश्रयण, समाश्रयण गुणांकों का गुणधर्म।

Internal Assessment **Max Marks: 30**

Three objective test conduct by Department of Mathematics at College level after completing each Unit.

I test from I Unit containing 10 Objective questions of 10 Marks

II test from II Unit containing 10 Objective questions of 10 Marks

III test from III Unit containing 10 Objective questions of 10 Marks

*Records of test is maintained by college and internal marks obtained by students are submitted to University before semester examination start.

महर्षि दयानन्द सरस्वती विश्वविद्यालय, अजमेर

MAHARSHI DAYANAND SARASWATI UNIVERSITY, AJMER

NAAC Accredited 'B++' Grade State University

B.Sc. Mathematics Syllabus

Degree Course (2025 – 2026)

Semester – V **Mathematics (Practical)** **Credit– 2**

Theory and Tutorial: 2 Classes/Week/Hour (Total 30 Hours per Semester) of paper of 2 Credits.

*Every student should participate in one **Massive Open Online Course** (MOOCs) available at Swayam/NPTEL portal on one DSE paper elected by the students in V semester. The student makes a record of MOOC contents in form of a file for the Practical Exam conduct by the institute.*

The marks distributions in practical exam is as follows:

- Practical exercise 1 Marks- 15
- Practical exercise 2 Marks - 15
- Viva-Voce Marks – 05
- Practical Record (Internal) Marks – 15

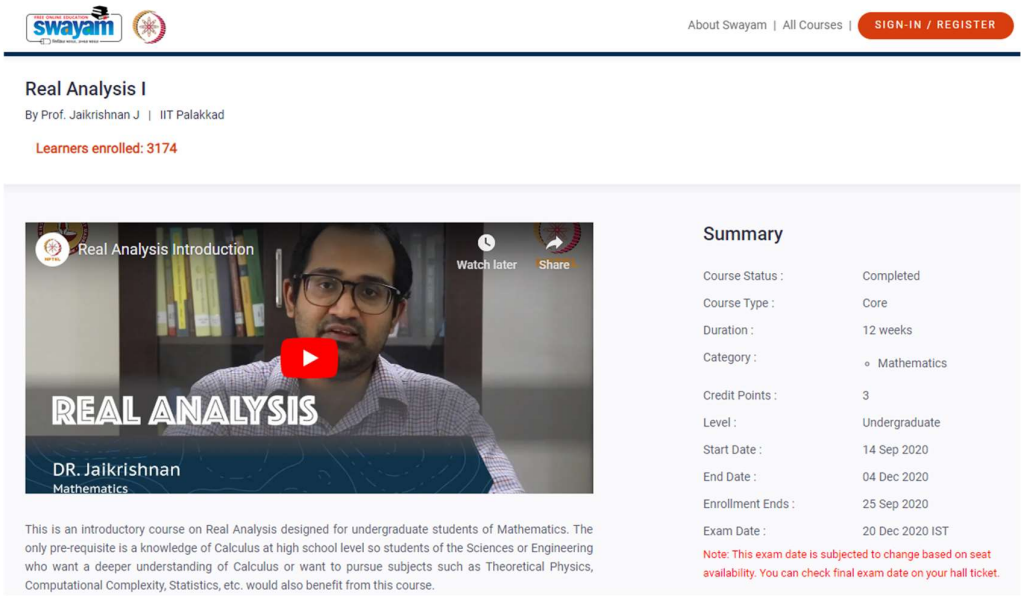
Total: Marks – 50

* **The course is free to enrol** and learn from. But if you want a certificate, you have to register and write the proctored exam conducted by us in person at any of the designated exam centres.
•The exam is optional for a fee of Rs 1000/- (Rupees one thousand only).

*** For example, some links of MOOCs are given here on all DSE courses provided in syllabus.**

DSE-1: Real Analysis

https://onlinecourses.nptel.ac.in/noc20_ma51/preview



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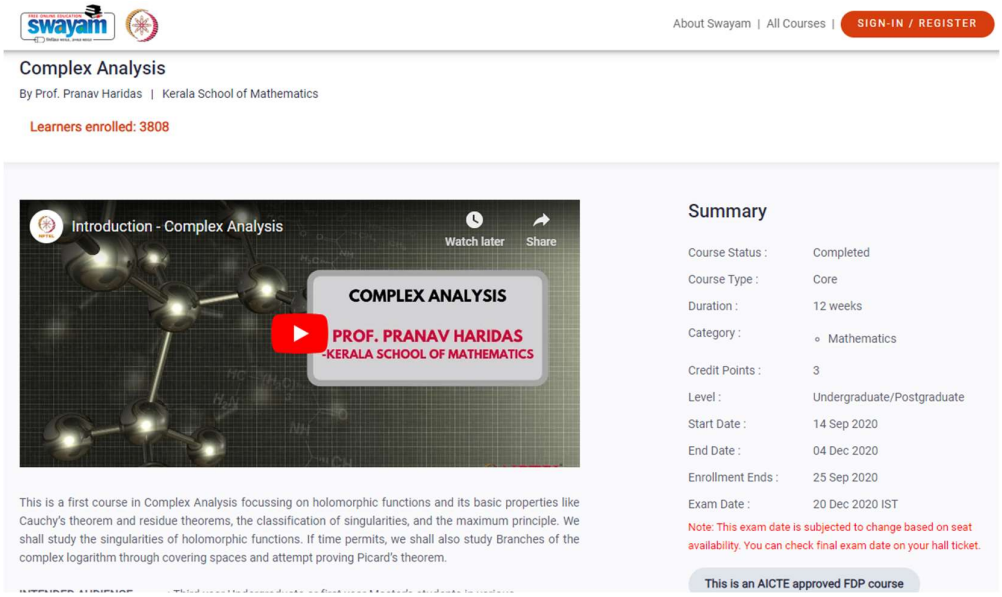
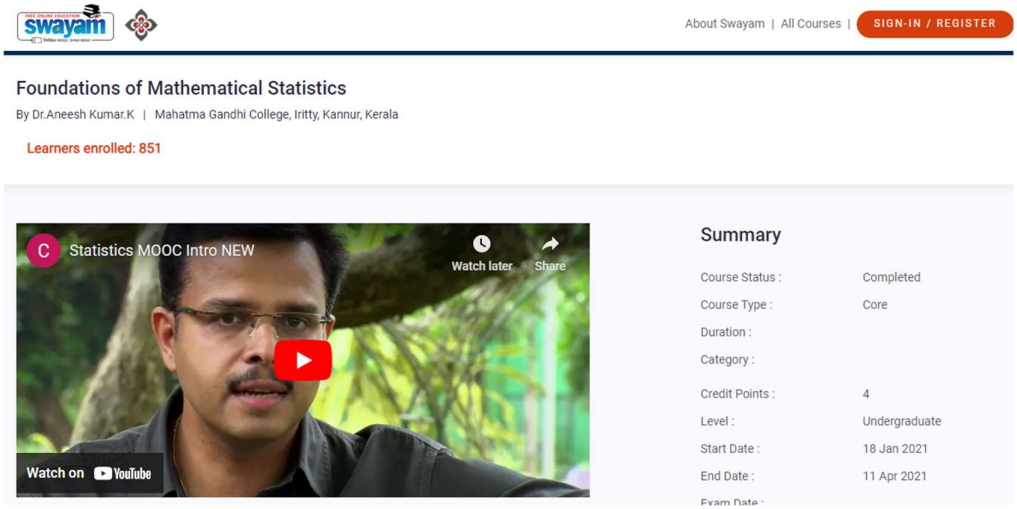
DSE-2: Complex Analysis

https://onlinecourses.nptel.ac.in/noc20_ma50/preview



DSE-3: Mathematical Statistics

https://onlinecourses.swayam2.ac.in/cec21_ma04/preview



- **If student not done any MOOC course in time, then Department of Mathematics of college organise practical exam for such students by making their practical record on concern DSE.**

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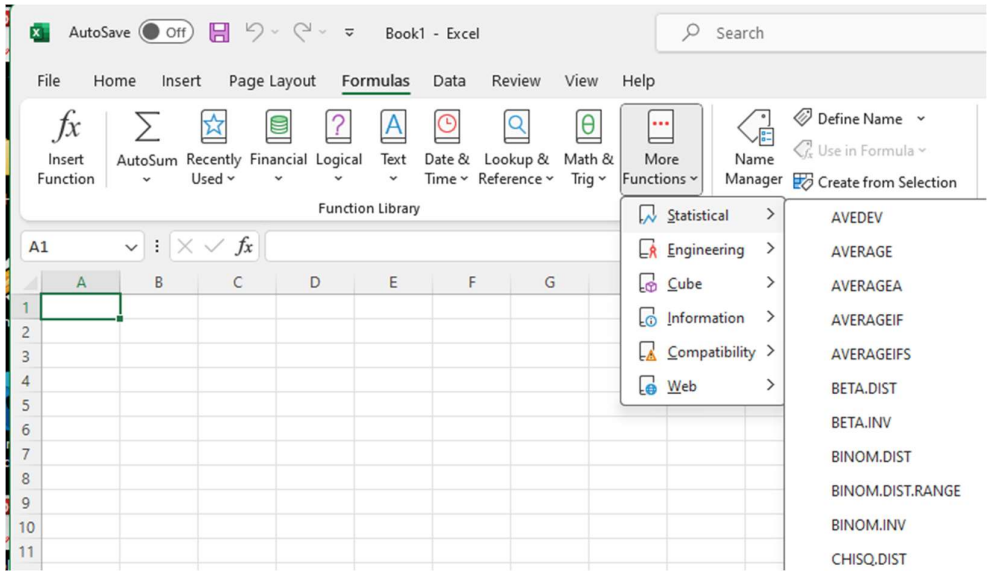
NAAC Accredited 'B++' Grade State University

Semester – V Mathematics (*Skill Enhancement Course) Credit– 2

Theory and Tutorial: 2 Classes/Week/Hour (Total 30 Hours per Semester) of paper of 2 Credits.

Use of MS Excel in Statistics Max Marks-50

Uses of MS Excel for teaching and learning Statistics in interdisciplinary subjects as skill enhancement course.



Describe the procedure of MS Excel to draw/evaluate the following functional formula:

- Mean,
- Mode,
- Median,
- CORREL,
- BINOM.DIST,
- POISSON.DIST.

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NAAC Accredited 'B++' Grade State University

B.Sc. Mathematics Syllabus

Degree Course (2025 – 2026)

Semester – VI **Mathematics** **Credit – 4**

Theory and Tutorial: 4 Classes/Week/Hour (Total 60 Hours per Semester) of Paper of 4 Credits.
One Paper of 100 Marks (External-70 Marks + Internal – 30 Marks)

DSE-1: Statics (स्थिति विज्ञान) Max. Marks: 70

UNIT I

Analytical conditions of equilibrium of coplanar forces, Friction.
समतलीय बलों की साम्यावस्था हेतु विश्लेषिक शर्ते, घर्षण।

UNIT II

Virtual work, Common Catenary.
कल्पित कार्य, सामान्य केटैनरी।

UNIT III

Forces in three dimensions, stable and unstable equilibrium
तीन विमाओं में बल, स्थायी व अस्थायी साम्य।

Internal Assessment **Max Marks: 30**

Three objective test conduct by Department of Mathematics at College level after completing each Unit.

I test from I Unit containing 10 Objective questions of 10 Marks

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III test from III Unit containing 10 Objective questions of 10 Marks

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DSE-2 : Dynamics (गति विज्ञान) Max. Marks: 70

UNIT I

Velocities and accelerations along radial, transverse, tangential and normal directions, Simple harmonic motion, Hooks law.
अरीय व अनुप्रस्थ दिशाओं में तथा स्पर्श रेखीय व अभिलाम्बिक दिशाओं में वेग एवं त्वरण, सरल आवर्त गति, हुक्स नियम।

UNIT II

Hook's law related problems on horizontal and vertical elastic strings, linear motion in resisting medium.
हुक्स नियम से सम्बंधित क्षैतिज एवं ऊर्ध्वाधर प्रत्यास्थ डोरी समस्याएं, प्रतिरोधी माध्यम से सरल रेखीय गति।

UNIT III

Constrained motion on smooth plane curves (circular and cycloidal motion), impact (direct and oblique)
चिकने समतल वक्रो पर प्रतिबंधित गति (वृतीय एवं चक्रजीय गति), संघट्ट (समक्ष एवं तिर्यक)।

Internal Assessment **Max Marks: 30**

Three objective test conduct by Department of Mathematics at College level after completing each Unit.

I test from I Unit containing 10 Objective questions of 10 Marks

II test from II Unit containing 10 Objective questions of 10 Marks

III test from III Unit containing 10 Objective questions of 10 Marks

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DSE-3 : Linear Programming and Optimization Techniques Max. Marks: 70

रेखिक प्रोग्रामन एवं इष्टतमकारी प्रविधियां

Unit I

Simplex method, Big-M method, Two phase method.

सिम्पलेक्स विधि, वृहत M-विधि, द्विचरण विधि।

Unit II

Degeneracy in Simplex method and it's resolution. Concept of duality in linear programming problems, formulation of dual problems with elementary theorems.

सिम्पलेक्स विधि में अपभृष्टता तथा इसका समाधान, रेखीय प्रोग्रामन में द्वैतता की अवधारणा, द्वैत समस्याओं का निर्माण सहित प्रारम्भिक प्रमेय।

Unit III

Introduction of Allocation problems, Assignment problems, Hungarian method, minimum row-cover method, unbalanced assignment problems. Transportation problems, North- West corner method, lowest cost entry method, Vogels approximation method, degeneracy and optimal solution of Transportation problem.

आंवटन समस्याओं का परिचय, नियतन समस्याएं, हंगेरियन विधि, न्युनतम पक्ति आवरक विधि, असंतुलित नियतन समस्या, परिवहन समस्याऐं, उत्तर-पश्चिम कोना विधि, न्यूनतम लागत प्रविष्टि विधि, वोगेल की सन्निकटन विधि, परिवहन समस्याओं की अपभृष्टता तथा इष्टतम हल।

Internal Assessment **Max Marks: 30**

Three objective test conduct by Department of Mathematics at College level after completing each Unit.

I test from I Unit containing 10 Objective questions of 10 Marks

II test from II Unit containing 10 Objective questions of 10 Marks

III test from III Unit containing 10 Objective questions of 10 Marks

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B.Sc. Mathematics Syllabus

Degree Course (2025 – 2026)

Semester – VI **Mathematics (Practical)** **Credit– 2**

Theory and Tutorial: 2 Classes/Week/Hour (Total 30 Hours per Semester) of paper of 2 Credits.

Every student Should participate in one ***Massive Open Online Course*** (MOOCs) *available at Swayam/NPTEL portal on one DSE paper elected by the students in VI semester. The student makes a record of MOOC contents in form of a file for the Practical Exam conduct by the institute.*

The marks distributions in practical exam is as follows:

- Practical exercise 1 Marks- 15
- Practical exercise 2 Marks - 15
- Viva-Voce Marks – 05
- Practical Record (Internal) Marks – 15

Total: Marks – 50

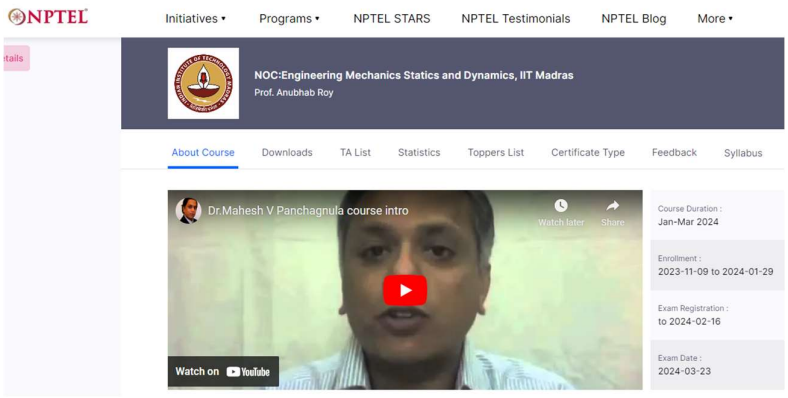
* **The course is free to enrol** and learn from. But if you want a certificate, you have to register and write the proctored exam conducted by us in person at any of the designated exam centres.

•The exam is optional for a fee of Rs 1000/- (Rupees one thousand only).

*** For example, some links of MOOCs are given here on all DSE courses provided in syllabus.**

DSE-1: Statics

https://nptel.ac.in/courses/112106180



DSE-2: Dynamics

https://onlinecourses.nptel.ac.in/noc21_me96/preview

DSE-3: Linear Programming & Optimization Techniques

https://onlinecourses.swayam2.ac.in/cec23_ma02/preview

- **If student not done any MOOC course in time, then Department of Mathematics of college organise practical exam for such students by making their practical record on concern DSE.**

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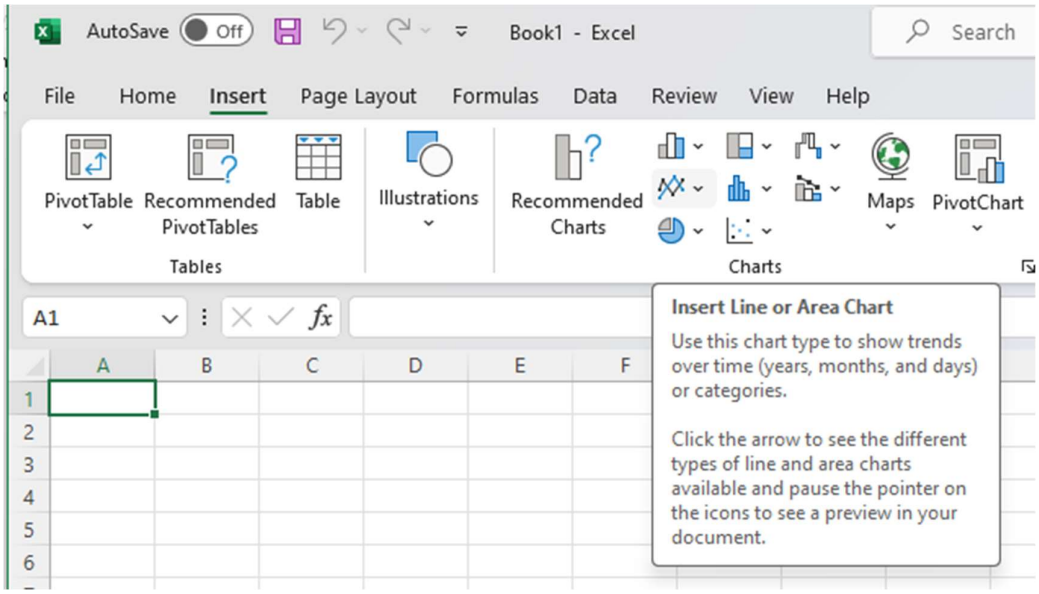
Semester – VI Mathematics (*Skill Enhancement Course) Credit– 2

Theory and Tutorial: 2 Classes/Week/Hour (Total 30 Hours per Semester) of paper of 2 Credits.

Use of MS Excel in Linear Programming Max Marks-50

Uses of MS Excel for teaching and learning Applied Mathematics in interdisciplinary subjects as skill enhancement course.



Describe the procedure of MS Excel to draw/evaluate the following graphs:

- Draw Constraints (≤ types),
- Draw Constraints (≥ types),
- Draw Constraints (= types),
- Obtain Feasible region (Bounded type),
- Obtain Feasible region (Unbounded type),
- No feasible region.