SCHOOL OF DISTANCE EDUCATION

UNIVERSITY OF KERALA

Scheme and Syllabus for the First Degree Programme under the Credit and Semester System (CSS) in School of Distance Education from 2017 Admission

Mathematics

(W e f 2017 Admissions)

Scheme and Syllabus for the First Degree Programme under Credit and Semester System (CSS) in SDE 2017 Admission onwards
Mathematics

Sem	Course Code	Course Title	Number of Credits	CE (Marks)	ESE (Marks)	Total
I	EN 1 1 1 1	Language Course I (English- I)	**4**	20	80	100
	M/H 1 1 1 1	Language Course II (Addl. Language)	**3**	20	80	100
	EN 1121	Foundation Course- I	**2**	20	80	100
	MM 11 4 1	Core- I-Methods of Mathematics	**4**	20	80	100
	CO 1 1 3 1	Complementary I – Fundamentals of Financial Accounting	**2**	20	80	100
	ST 1 1 3 1.1	Complementary II- Descriptive Statistics and Introduction to probability	**2**	20	80	100
		TOTAL	**17**	**120**	**480**	**600**
II	EN 1 2 1 1	Language Course III (English II)	4	20	80	100
	EN 1 2 1 2	Language Course IV (English III)	3	20	80	100
	M/H 1 2 1 1	Language Course V (Addl. Language II)	3	20	80	100
	MM 1221	Foundations of Mathematics	4	20	80	100
	CO 1 2 3 1	Complementary III- Advanced Financial Accounting	2	20	80	100
	ST 1 2 3 1.1	Complementary IV- Random variables	2	20	80	100

		TOTAL	**18**	**120**	**480**	**600**
III	EN 1 3 1 1	Language Course VI (English- IV)	4	20	80	100
	M/H 1 3 1 1	Language Course VII (Addl. Language III)	4	20	80	100
	MM1 3 4 1	Core III –Algebra & Calculus-I	4	20	80	100
	CO 1331	Complementary V-Cost Accounting	3	20	80	100
	ST 1331.1	Complementary VI- Probability distribution and theory of estimation	3	20	80	100
		TOTAL	**18**	**100**	**400**	**500**
IV	EN 1 4 1 1	Language Course VIII (English V)	4	20	80	100
	M/H 1411	Language Course IX (Addl.Lan.IV)	4	20	80	100
	MM 1441	Core IV- Algebra & Calculus-II	4	20	80	100
	CO 1431.1	Complementary VIII- E Commerce	3	20	80	100
	Co1431.2	Complementary IX- Management accounting	3	20	80	100
	ST 1431.1	Complementary VIII- Testing of hypothesis and analysis of variance	3	20	80	100
	ST1432.1	Complementary practical using excel	4	20	80	100
		TOTAL	**25**	**140**	**560**	**700**
V	MM 1 5 4 1	Core VI- Real Analysis I	4	20	80	100
	MM 1 5 4 2	Core VII Complex Analysis I	3	20	80	100

	MM 1 5 4 3	Core VIII – Differential Equations	4	20	80	100
	MM 1 5 4 4	Core IX– Vector Analysis	4	20	80	100
	MM 1 5 4 5	Core X-Abstract Algebra I	4	20	80	100
	MM 1 5 5 1	Open Course-	2	20	80	100
	MM 1 6 46	Project Work	-	-	-	-
		TOTAL	**21**	**120**	**480**	**600**
VI	MM 1 6 4 1	Core XI – Real Analysis II	4	20	80	100
	MM 1 6 4 2	Core XII– Linear Algebra	4	20	80	100
	MM 1 6 4 3	Core XIII- Complex Analysis II	4	20	80	100
	MM 1 6 44	Core -14 Abstract Algebra II	3	20	80	100
	MM 16 45	Computer Programming (Practical)	4	20	80	100
	MM 1 6 61	Elective Course-Graph Theory	3	20	80	100
	MM 1646	**Project**	**4**		**80+ 20 viva**	**100**
		TOTAL	**26**	**120**	**580**	**700**
		GRAND TOTAL	**125**	**680**	**2820**	**3700**

Syllabus for the First Degree Programme in Mathematics of the University of Kerala

Semester I
Methods of Mathematics

Code: MM 1141 Instructional hours per week: 4

No.of credits: 4

Module I Algebra

Text : Lindsay N. Childs, A Concrete Introduction to Higher Algebra, Second Edition, Springer

In this part of the course, we study the basic properties of natural numbers, traditionally called Theory of Numbers. It is based on Chapters 2–5 of the text. Students should be encouraged to read the textbook and try to do the problems on their own, to gain practice in writing algebraic proofs. All the problems and exercises at the end of each section are to be discussed.

We start with the methods of proofs by induction, as in Sections A and B of Chapter 2. The intuitive idea that these methods give a scheme of extending a result from one natural number to the next independent of the number under consideration should be stressed. The fact that the second principle is easier in some cases should be illustrated through examples such as Example 1 of Section B. The logical equivalence of these two methods (Theorems 1 and 2 of Section B) need not be discussed.

We then pass onto the well ordering principle, as in Section C. Example E1, Theorem 1 and Proposition 3 should be discussed with proofs based on this principle. The deduction of this principle from the principle of induction, as in Theorem 2, need not be done. Thus the two principles of induction and the well-ordering principle need only be discussed as intuitively obvious properties of natural numbers.

Before introducing the Division Theorem, as in Section D, the usual process of long division to get the quotient and remainder must be recalled through examples and the formal proof of this theorem should be linked to these examples. After proving the this theorem and the Uniqueness Proposition as in this section, the representation of natural numbers in diff erent bases can be explained as in Section E. The last section of Chapter 2 on operations in diff erent bases (Section F) need not be discussed.

The idea of the Greatest Common Divisor of two natural numbers, studied in elementary class, is to be recalled next and the existence of a such a number justified, as in Section A of Chapter 3. The idea of coprimality is also to be considered here. Some of the important properties of coprime numbers, as in Exercises E9, E10 and E11 must be discussed. Next, Euclid's Algorithm and some of its applications are to be dis-cussed, as in Section B. After discussing the theoretical consequences of Euclid's Algorithm, namely Bezout's Identity and its corollaries, as in Section C, its practical use in solving indeterminate equations of the first degree is to be discussed, as in the text. (See also http://en.wikipedia.org/wiki/Diophantine_equation) The last two sections of this chapter on the efficiency of Euclid's Algorithm (Section D) and on incommensurability (Section E) need not be discussed.

A discussion on primes and The Fundamental Theorem on Arithmetic, as given in the first three section of Chapter 4 are to be done next. The last section of this chapter on primes in an interval need not be discussed.

Finally we introduce the new idea of congruences as in Chapter 5. The fact that when an integer is divided by another, the dividend is congruent to the remainder modulo the divisor

should be emphasized. In discussing the basic properties of congruences the fact that the cancellation of common factors does not hold in general for congruences should be emphasized and illustrated through examples. This part of the course is based on Sections A, B, C of Chapter 5.

Module 2 Calculus

Text : Howard Anton, et al, Calculus, Seventh Edition, John Wiley

In this part of the course, the basic ideas of diff erentiation of real valued functions are consid-ered. It is based on Chapters 1–3 of the text.

We start with the intuitive idea of a function as the dependence of one quantity on another as in the subsection titled functions of Section 1.1 of the text and pass on to Definitions 1.1.1 and 1.1.2. We next discuss basic properties of functions, as in Section 1.2. It must be emphasized through illustrations that not all equations connecting two variables give one variable as a function of the other, as in Example 1 of Section 1.2 of the text. (The notion of explicit and implicit definitions of functions and their graphs, as given in the first two parts of Section 3.6 can be discussed here itself.) Functions defined piecewise and their graphs must be specially mentioned and illustrated. Approximate solutions to problems through graphical methods are to be explained as in Example 7 of the section. Section 1.3 on using computers may be skipped, but the use of computers in plotting graphs should be demonstrated, using Open Source Software such as GeoGebra or Gnuplot.

(See also http://www-groups.dcs.st-and.ac.uk/~history/Curves/Curves.html) Some of the ideas in Section 1.4, such as arithmetic operations on functions, maybe familiar to the students, but they should be reviewed. Other ideas such as symmetry, stretching and compression and translation maybe new and should be emphasized. Section 1.5 named lines maybe supplemented with Appendix C, Coordinate Planes and Lines. Section 1.6 on families of functions and Section 1.7 on mathematical modelling need not be discussed. But parametric equations, especially that of the cycloid, must be discussed in detail, as in Section 1.8.

Limits and continuity are concepts introduced in Higher Secondary class. In this course, the intuitive description of of these ideas are to be reinforced through tabulation and plotting and illustrated through examples, as in Sections 2.1–2.3. The rigorous description of limits, as in Section 2.4, need not be discussed. Sections 2.5 and 2.6 on continuity must be discussed.

The notion of diff erentiation is also familiar to the students. Here, this idea is to be re-introduced through applications as in the first two sections of Chapter 3.

(See also http://en.wikipedia.org/wiki/History_of_calculus) The discussion of velocity and slopes at the beginning of Section 3.1 maybe based on Example 1 of Section 2.1, instead of the unfamiliar bell-pulling example. Much of the material in Sections 3.3– 3.7 maybe already seen, but they should be reviewed, emphasizing the graphical meaning and applications. The idea of implicit diff erentiation should be made clear, as in Section 3.6. The last section on approximations, Section 3.8, need not be discussed.

Module 3 Analytic Geometry

Text: Howard Anton, et al, Calculus, Seventh Edition, John Wiley

This part of the course is a detailed discussion on conics, based on Sections 11.4, 11.5 and parts of 11.6 of the text. Students are introduced to the standard equation of the conics in the Higher Secondary class, but little else on conics. Here we start with the geometri-cally unified description of conics as sections of a cone, as in the subsection conic sections

of Section 11.4 of the text (see also http://en.wikipedia.org/wiki/Conic_sections) and pass on to the description subsection definition of the conic sections. Various problems in Exercise Set 11.4 on practical applications of conics should be discussed. The-orem and the discussions following it are to be discussed next. (The connection between the description of conics as sections of cone and using the focus-directrix property can be in http://en.wikipedia.org/wiki/Dandelin_spheres) Finally, the geometric and algebraic description of conics tilted with respect to the coordinate axes are discussed as in Section 11.5, culminating in Theorem 11.5.2 characterizing the graphs of all second degree equations in two variables.

The final aim of this part is to give a complete characterization of graphs of second degree equations in two variables as given in Theorem 11.5.2, thus giving an algebraically unified description of conics.

References:

1. James Stewart, Essential Calculus, Thompson Publications, 2007.
2. Thomas and Finney,Calculus and Analytic Geometry, Ninth Edition, Addison-Wesley.
3. S.Lang, A first Calculus, Springer.

Distribution of instructional hours:

Module 1: 24 hours; Module 2: 36 hours; Module 3: 12 hours

Semester II

Foundations of Mathematics

Code: MM 1221 Instructional hours per week: 4

No.of credits: 3

Module I Algebra

Text : Lindsay N. Childs, A Concrete Introduction to Higher Algebra, Second Edition, Springer

We continue the study of the theory of numbers, based on parts of Chapters 5–7 and Chap-ters 9–10 of the text. (Chapter 8, discussing abstract ideas is postponed to the next semester.)

We start with Sections D and E of Chapter 5, which discuss more properties and applications of the idea of congruence introduced in the first semester course. We then pass on to the idea of congruence classes and related ideas, as in Chapter 6 of the text. The notion of Congruence modulo m, done in the first semester, is now introduced as an equivalence relation and the congruence classes modulo m are discussed through examples such as Z/2Z and Z/12ZZ (clock arithmetic), leading to the general set Z/mZ. Here we can recall the ideas of equivalence relation (learnt in Higher Secondary class) and partition and the relation between the two. The sections named Rational Numbers, Equivalence Classes and Natural Numbers of Chapter 1 should be used to supplement this discussion. As applications, only Section A of Chapter 7 on round robin tournaments and Section C on trial division need be discussed.

Next we move on to Fermat's and Euler's Theorems, as in Chapter 9. Only the first four sections of this chapter need be done. (The other sections are to be discussed in the next semester.) In Section C, exercises E7–E10 on the computation of Euler's phi function must be done and used to compute the phi-value of some specific numbers see also Bernard and Child, Higher Algebra. As an applications, only Finding Higher Powers Modulo m (Section D of Chapter 9, see also http://en.wikipedia.org/wiki/RSA), rsa Codes
Mersenne Numbers and Fermat Numbers (Section C of Chapter 10) need be done.

Module 2 Calculus

Text : Howard Anton, et al, Calculus, Seventh Edition, John Wiley

In this part, we continue the discussion on calculus and analytic geometry started in the first semester. It is based on parts of Chapters 4–8 and Chapter 11 of the text.

We start with the discussion on how the derivative of a function can be used to visualize the graph of the function in better detail, as described in Sections 4.1–4.3 of the text. We then discuss how the ideas of maxima and minima can be used to solve practical problems, as in Section 4.5. Sections 4.4, 4.7 and 4.8 need not be discussed.

We next introduce the idea of integration as anti-diff erentiation, as in Definition 5.2.1. As motivation for this idea, the first two subsections, finding position and velocity by integration and uniformly accelerated motion of Section 5.7 can be used. The lat two subsections of Section 5.2, integration from the viewpoint of differential equations and direction fields, need not be discussed. After completing Sections 5.2 and 5.3, we turn to the area problem, as in Section 5.1. We pass on to the subsections definition of area and net signed area of Section 5.4. Only Definitions 5.4.3 and 5.4.5 of this section and the discussions preceding these need be discussed. We then discuss the subsection Riemann sums and the definite integral of Section 5.5. Only Definition 5.5.1 and Theorems 5.5.4 and of this section need be discussed. The connection between anti-diff erentiation and Riemann integration is to be discussed next, as in the subsection the fundamental theorem of calculus of Section 5.6. The proof of Theorem 5.6.1 and the remaining parts of this section need not be discussed. But Sections 5.7 and 5.8 are to be discussed in full. Applications of integration comes next, as in Sections 6.1–6.5 of the test.

Sections 6.6 and 6.7 need not be discussed.

Though the idea of inverse functions is introduced in the Higher Secondary class, this has to be done in a more thorough manner as in Section 7.1. Also, the ideas have to be graphically interpreted. Before discussing the exponential and logarithmic functions, the idea of irrational exponents has to be made clear, as in Section 7.2. After Section 7.3 on diff erentiation and integration of the exponential and logarithmic functions, Section 7.6 on inverse trigonometric functions, Section 7.7 on LHospital's Rule and Section 7.8 on hyperbolic functions are to be done in full. Sections 7.4 and 7.5 need not be discussed.

Various techniques of integration are to be considered next, as in Sections 8.1–8.5. Then improper integrals are to be discussed as in Section 8.8. The other sections, 8.6 and 8.7 need not be discussed.

Module 3 Analytical Geometry

Text : Howard Anton, et al, Calculus, Seventh Edition, John Wiley

In this part of the course, we introduce polar coordinates as in Section 11.1 of the text. Areas in polar coordinates are to be done as in Section 11.3 and the polar equations of con-ics as in Section 11.6. The subsection applications in astronomy must also be discussed.

References:

1. James Stewart, Essential Calculus, Thompson Publications, 2007.
2. Thomas and Finney,Calculus and Analytic Geometry, Ninth Edition, Addison-Wesley.
3. S.Lang, A first Calculus, Springer.

Distribution of instructional hours:

Module 1: 24 hours; Module 2: 36 hours; Module 3: 12 hours

Semester III

Algebra and Calculus I

Code: MM 1341 Instructional hours per week: 5

No.of credits: 4

Module I Algebra

Text : Lindsay N. Childs, A Concrete Introduction to Higher Algebra, Second Edition, Springer

Continuing the discussion on number theory in the first two semesters, here we make first contact with the part of mathematics currently called Abstract Algebra. It is based on parts of Chapters 8, 9, and 12 of the text.

Contrary to the usual stand-alone courses on abstract algebra, we introduce rings before groups, since the former arise naturally as generalizations of number systems. Sections A and B of Chapter 8, (including the problems) are to be discussed in full. In section C, the definition of characteristic and the rest of the portions need not be discussed. More examples of rings and exercises on homomorphism can be given to get a clear idea of the concepts.

Next comes a discussion on the units of the ring of congruence classes leading to the defi-nition of an abstract group and then the group of units of an abstract ring, as in Section E and Section F of Chapter 9. This culminates in the Abstract Fermat's Theorem, as in Section E. The proofs of generalized associativity or generalized commutativity need not be discussed. But the fact that a set G with an associative multiplication is a group, if it either has the identity and inverse properties or has the cancellation and solvability properties has to be proved (see T. W .Hungerford, Algebra). The exponent of an Abelian group, as in Section 9F also has to be discussed. As an illustration of the interplay between number theory and abstract algebra, we consider the The Chinese Remainder Theorem, as in Section A of Chapter 12. Only the first part and the problems E1, E2, E3 and E4 of this section need be discussed , The alternate method of reducing all the congruences to one need not be considered. As another application, the multiplicative property of the phi function discussed earlier must be redone (Corollary 3 of Section C). The square roots of 1 modulo some integer, as in Section C of Chapter 12 must also be discussed.

References:

1. J B Fraleigh, A First Course in Abstract Algebra, Narosa Publications
2. I N Herstein, Topics in Algebra, Vikas Publications
3. J A Gallian, Contemporary Abstract Algebra, Narosa Publications
4. D A R Wallace, Groups, Rings and Fields, Springer
5. Jones and Jones, Number Theory, Springer

Module 2 Analytic Geometry

Text : Howard Anton, et al, Calculus, Seventh Edition, John Wiley

In this part of the course, we consider equations of surfaces and curves in three dimensions. It is based on Chapter 12 of the text.

Students have had an introduction to analytic geometry in three dimensions, such as the equations to planes and lines, and to vectors in their Higher Secondary Classes. These must be reviewed with more illustrations. Here the aid of a plotting software becomes es-sential. The Free Software Gnuplot mentioned earlier has such 3d capabilities. (see also http://mathworld.wolfram.com/topics/Surfaces.html)

After discussing spheres and cylindrical surfaces as in Section 12.1, We pass on to a discussion of vectors, as in Section 12.2. The physical origins of the concept must be emphasized as in the subsection, vectors in physics and engineering. The definition of vector addition can be motivated by the discussion given in the subsection, resultant of concurrent forces which may be familiar to students from their high school physics. All the sections of the chapter are to be discussed in the same spirit, emphasizing both the physical and geometrical interpretations.

Module 3 Calculus

Text : Howard Anton, et al, Calculus, Seventh Edition, John Wiley

Here we extend the operations of diff erentiation and integration to vector valued functions of a real variable, based on Chapter 13 of the text.

All sections of this Chapter must be discussed, with emphais on geometry and physics, as in the text. The problems given in various exercise sets should be an essential part of the course. Exercises 17 (a) and 17 (b) of Exercise Set 13.5 on curvature of plane curves and some of its applications in the subsequent exercises must be discussed in detail.

References:

1. James Stewart, Essential Calculus, Thompson Publications, 2007.
2. Thomas and Finney,Calculus and Analytic Geometry, Ninth Edition, Addison-Wesley.
3. S.Lang, A first Calculus, Springer.

Distribution of instructional hours:

Module 1: 36 hours; Module 2: 27 hours; Module 3: 27 hours

Semester IV

Algebra and Calculus II

Code: MM 1441 Instructional hours per week: 5

No.of credits: 4

Module I Algebra

Text : Lindsay N. Childs, A Concrete Introduction to Higher Algebra, Second Edition, Springer

Continuing the study of rings in the last semester, here we introduce polynomials as another example. This part of the course is based on Chapters 14, 15 and parts of Chapter 16 of the text.

After reviewing the idea of polynomials studied in High School, we introduce polynomials over a commutative ring. The distinction between polynomial as an algebraic expression and polynomial as a function should be emphasized, as in the section Polynomials and Functions of Chapter 14. All sections of Chapters 14 and 15 are to be discussed.

We then briefly consider irreducible polynomials with real coefficients. After discussing the dependence of irreducibility on the field of coefficients as in the beginning of Chapter 16, we pass on to Section C. The reducibility of polynomials of degree greater than 2 over real numbers must be mentioned, but Euler's proof for degree 4 need not be discussed. The fact that the root of a polynomial gives a factor leads to the consideration of roots as in Section E. (Complex numbers, as in Section D need not be discussed here.) The origin of complex numbers in the study of cubic equations must be emphasized. (See also, Paul J Nahin, An Imaginary Tale: The Story of $\sqrt{-1}$) The unsolvability of higher degree polynomials by radicals, mentioned at the end of this section, must be noted. The Fundamental Theorem of Algebra must next be discussed. This theorem need not be proved, but Euler's real version (Corollary 1) must be proved based on this, as in the text.

References:

1. J B Fraleigh, A First Course in Abstract Algebra, Narosa Publications
2. I N Herstein, Topics in Algebra, Vikas Publications
3. J A Gallian, Contemporary Abstract Algebra, Narosa Publications
4. D A R Wallace, Groups, Rings and Fields, Springer
5. Jones and Jones, Number Theory, Springer

Module 2 Calculus

Text : Howard Anton, et al, Calculus, Seventh Edition, John Wiley

In this part of the course, we consider the calculus of functions of two variables. It is based on Chapter 14 and Chapter 15 of the text. The geometric interpretation of the ideas should be emphasized throughout, with the aid of plotting software such as Gnuplot.

After a discussion of functions of two variable and their graphs, as in the first section of Chapter 14, we discuss the concepts of limit and continuity of such functions. We then move on to a discussion of diff erentiation of functions of two variables, as in Sections 14.1–14.3, 14.5 and 14.8–9. Section 14.4 on diff erentiability and diff erentials and Section 14.6 on directional derivatives and Section 14.7 on tangent planes need not be discussed.

Integration in space is to be done as in Sections 1–5 of Chapter 15. The last three sections of Chapter 15 need not be discussed.

References:

1. James Stewart, Essential Calculus, Thompson Publications, 2007.
2. Thomas and Finney,Calculus and Analytic Geometry, Ninth Edition, Addison-Wesley.
3. S.Lang, A first Calculus, Springer.

Distribution of instructional hours:

Module 1: 36 hours; Module 2: 54 hours

Semester V

Real Analysis I

Code: MM 1541 Instructional hours per week: 5

No.of credits: 4

Text : R. G. Bartle and D. R. Sherbert, Introduction to Real Analysis, Third Edition, Wiley

In this course, we discuss the notion of real numbers and the ides of limits in a formal manner. Many of the topics discussed in this course were introduced somewhat informally in earlier courses, but in this course, the emphasis is on mathematical rigor. It is based on Chapters 2–4 of the text.

In teaching this course, all ideas should be first motivated by geometrical considerations and then deduced algebraically from the axioms of real numbers as a complete ordered field. Also, the historical evolution of ideas, both in terms of physical necessity and mathematical unity should be discussed. Thus the course emphasizes the dialectic between practical utility and logical rigor in general, and within mathematics, that between geometric intuition and algebraic formalism.

Throughout the course, examples and exercises in the text should be used to illustrate the ideas discussed. Students should be encouraged to do problems on their own, to gain practice in writing rigorous proofs.

Module 1

The first step is to make precise the very concept of number and the rules for manip-ulating numbers. The course can start with a historical overview of how diff erent kinds of numbers were constructed in diff erent periods in history, depending on the physical or mathematical needs of the age. (See for example, the three articles on real numbers at www-groups.dcs.st-and.ac.uk/~history/Indexes/Analysis.html) A discussion on how real numbers are conceived as lengths and hence as points on a line should follow this. The eff orts to approximate irrational numbers by rational numbers, in the familiar instances such as $\sqrt{2}$ and π can lead to the modern decimal representation and this gives semi-rigorous definitions of operations on real numbers.

The realization of the set R of real numbers as a field can be introduced at this stage and compared with the set Q of rational numbers, as in 2.1.1–2.1.4 of the textbook. The idea of order in Q and R must be introduced next, as in 2.1.5–2.1.13 of the textbook. The notion of absolute value and that of a neighborhood, as in 2.2.1–2.2.9 of the textbook comes next.

The discussion of the completeness property of R requires some care. The version given in 2.3.6 of the text is highly counter-intuitive as an axiom. Instead, Instead the following version due to Dedekind can be used:

> If the set of real numbers is split into two non-empty sets such that every number in one set is less than every number in the other, then either the first set contains a least number or the second set contains a largest number

And this can be easily interpreted geometrically as a line considered as a set of points. (See R. Dedekind, Essays on The Theory of Numbers, available as a freely downloadable e-book at http://www.gutenberg.org/etext/21016) The supremum property of R can easily proved as a consequence of this axiom.

It should be emphasized at this point that in this course, the only assumptions we make about R are the axioms of a complete ordered field and every definition we make would be given in terms of these and every result we propose would be deduced from these axioms (and the theorems proved earlier). The remaining part of Section 2.3 and Section 2.4 in full are to be discussed as in the test. In Section 2.5, the subsections, The Uncountability of R, Binary Representations, Decimal Representations, Periodic Decimals and Cantor's Second Proof need not be discussed.

Module 2

We then pass on to the idea of limits of sequences and series, as in Chapter 3 of the text. It should be supplemented by Sections 10.2 and 10.4 of the calculus text by Anton (used in earlier semesters) to provide motivation, illustrative examples and more exercises.

Module 3

Limits of functions are to be discussed as in Chapter 4 of the text. Before introducing the rigorous definition of limits, the informal description of these ideas through graphs, as done in the earlier calculus courses should be recalled. Also, the various theorems should be illustrated through examples and exercises given in the text. Plotting software such as Geogebra can be used to plot the various functions discussed in Chapter 4.

References

1. A. D. Alexandrov et al., Mathematics:Its Content, Methods and Meaning, Dover
2. R. Dedekind, Essays on The Theory of Numbers, available as a freely dowloadable e-book at http://www.gutenberg.org/etext/21016)
3. W. Rudin, Principles of Mathematical Analysis, Second Edition, McGraw-Hill
4. A. E. Taylor, General Theory of Functions and Integration, Dover

Distribution of instructional hours:

Module 1: 30 hours; Module 2: 30 hours; Module 3: 30 hours

Semester V

Complex Analysis I

Code: MM 1542 Instructional hours per week: 4

No.of credits: 3

Text : Joseph Bak and Donald J. Newman, Complex Analysis. Third Edition, Springer

In this course, we discuss the basic properties of complex numbers and extend the notions of diff erentiation and integration to complex functions. It is based on Chapters 1–4 of the text. Examples and exercises in the text forms an integral part of the course.

Module 1

The basic operations on complex numbers are familiar to the students from their Higher secondary course. Also, the historical motivation for complex numbers is briefly touched upon in Module 1 of the fourth-semester course Algebra and Calculus iv. So, the present course can start with a brief review of the Introduction and a discussion on the representation of complex numbers as ordered pairs of real numbers as in Section 1.1. The other sections of this chapters are to be discussed in order. The definition of uniform convergence and

M-test in Section 1.4 need not be discussed. Also, Stereographic Projection as in Section 1.5 need not be discussed, but infinite limits should be introduced (I.11 Definition). The use of complex numbers in number theory and geometry are to be illustrated using Exercises 9, 10 and 14 of this chapter.

We then pass on to the definition of complex functions, starting with polynomials as Chapter 2..The diff erence between a polynomial function of two real variables and that of a single complex variable should be emphasized as in the Introduction to this chapter. Also, in discussing Another Way of Recognizing Analytic Polynomials preceding 2.2 Definition, it should be noted that the field operations allow us only to define upto rational functions of complex numbers and that expressions like cos(x + iy) are meaningless at this stage. In discussing power Series as in Section 2.8, the proof of 2.8 Theorem and the comment following the proof about uniform convergence need not be discussed. Examples 1–3 following this are to be emphasized as signifying the behaviour of diff erent power series on the circle of convergence. The remainig part of Chapter 2 should be discussed in full.

Module 2

In Chapter 3 on analytic Functions, the proof of 3.2 Proposition on the sufficiency of Cauchy-Riemann Equations for analyticity need not be done. Except for this, Chapter 3 must be done in full. Exercises 21–23 on the power series expansions of the exponential function and the sine and cosine functions must also be discussed in detail.

Module 3

In Chapter 4, the definition of the integral of f along C (4.3 Definition of the text) should be motivated as limit of the Riemann sums of the form $f(z_k)(z_k - z_{k-1})$ (see for example, the mit OpenCourseWare video of Lecture 5 of Part I Calculus under Calculus Revisited). In Section 4.1, the result on the integral of uniform limit (4.11 Proposition) need not be discussed. Section 4.2 is to be discussed in full.

References

1. James Brown and Ruel Churchill, Complex Variables and Applications, Eighth Edition, McGraw-Hill

2. J. M. Howie, Complex Analysis Springer

Distribution of instructional hours:

Module 1: 24 hours; Module 2: 24 hours; Module 3: 24 hours

Semester V

Differential Equations

Code: MM 1543 Instructional hours per week: 3

No.of credits: 3

Texts : 1. Howard Anton, et al, Calculus, Seventh Edition, John Wiley

2. Erwin Kreyszig, Advanced Engineering Mathematics, Eigth Edition, Wiley-India

In this course, we discuss how differential equations arise in various physical problems and consider some methods to solve first order differential equations and second order linear equations. It is based on parts of Chapters 5 and 9 of [1] and Chapter 2 of [2].

Module 1

In this module we discuss first order equations and is based on [1]. We start with some simple examples of physical situatons in which diff erential equations arise, using some of the examples of Section 9.3. This is to be followed by the last two subsections of Section 5.2, integration from the viewpoint of differential equations and direction fields includeing problems related to these ideas from Exercise Set 5.2. We next consider first order diff er-ential equations as in Sections 9.1–9.3. Then we discuss Exact Differential Equations as in Section 1.5 of [2].

Module 2

Second order linear diff erential equations are discussed in this module and it is based on Chap-ter 2 of [2]. More precisely, Sections 2.1–2.3 and Sections 2.4–2.11 must be done in detail, including relevant problems. Section 2.3 on Differential Operators need not be dis-cussed

References

1. G. F. Simmons, Diff erential Equations with applications and Hystorical notes, Tata McGraw-Hill, 2003

2. Peter V. O' Neil, Advanced Engineering Mathematics, Thompson Publications, 2007

Distribution of instructional hours:

Module 1: 27 hours; Module 2: 27 hours

Semester V

Vector Analysis

Code: MM 1544 Instructional hours per week: 3

No.of credits: 3

Text : Howard Anton, et al, Calculus, 7th Edn, John Wiley

In this course, we consider some advanced parts of vector calculus. It is based on parts of Chapter 14 and Chapter 16 of the text. The physical motivation and interpretation of the various mathematical concepts should be emphasized throughout, as in the text.

Module 1

We begin with the notion of directional derivatives as in Section 14.6. The last subsection on derivative of a function of several variables need not be discussed. We then pass on to the definition of a vector field and its divergence and curl, as in Section 16.1. The del and Laplacian operators must also be discussed. We next discuss line integrals, as in Section and then conservative vector fields, as in Section 16.3. This module of the course ends with a discussion of Green's Theorem, as in Section 16.4.

Module 2

In this module, we introduce the notion of a surface integral and discuss Gauss's Theorem and Stoke's Theorem and their applications, as in Sections 16.5–16.8 of the text

References:

1. Thomas and Finney, Calculus and Analytic Geometry, Ninth Edition, Addison-Wesley.
2. Kreyzig, Advanced Engineering Mathematics, 8***th*** edition, John Wiley.
3. Peter V. O' Neil, Advanced Engineering Mathematics, ThompsonPublications, 2007
4. Michael D. Greenberg, Advanced Engineering Mathematics, PearsonEducation, 2002.

Distribution of instructional hours:

Module 1: 27 hours; Module 2: 27 hours

Semester V

Abstract Algebra I

Code: MM 1545 Instructional hours per week: 5

No.of credits: 4

Text : John B. Fraleigh, A First Course in Abstract Algebra. Seventh Edition, Narosa

Students introduced to some elements of Abstract Algebra in Semester IV are now ready to do it rigorously. In this course, we discuss the basics of abstract group theory, based on Sections 2–10 of the text.

Students should be given training to write proofs and to do problems, based on axioms. The recommended text contains lots of examples and exercises. Most of the problems in this text are computational and hence the student can try them as assignments with proper guidance of the teacher.

Module 1

The course begins with section 0, which can be reviewed quickly. The subsection on Cardi-nality need not be discussed. We then move on to Section 2 on binary relations (skipping Section 1. The ideas of binary operation on a set, well definedness of a binary operation and a set closed under a binary operation should be emphasized. Isomorphisms of binary structures should be done in detail, as in Section 3. After recalling the idea of abstract groups introduced in the previous semester, Section 4 on groups, Section 5 on subgroups and Section 6 on cyclic groups must be done in full. Section 7, Generating Sets and Cayley Digraphs, need not be discussed.

Module 2

We next consider the group of permutations in detail, as in Section 8–10 (Chapter II) and cosets and Lagrange's Theorem, as in Section 10. The first part of Section 11 on direct prod-ucts of groups should also be discussed. The second part, Finitely Generated Abelian Groups and the entire Section 12, Plane Isometries need not be discussed.

References:

1. I N Herstein, Topics in Algebra, Vikas Publications
2. J A Gallian, Contemporary Abstract Algebra, Narosa Publications
3. D A R Wallace, Groups, Rings and Fields, Springer

Distribution of instructional hours:

Module 1: 45 hours; Module 2: 45 hours

Semester V

Operations Research (Open Course)

Code: MM 1551.1 Instructional hours per week: 3

No. of Credits: 2

Module 1 Linear Programming: Formulation of Linear Programming models, Graphical solution of Linear Programs in two variables, Linear Programs in standard form - basic variable - basic solution- basic feasible solution -feasible solution, Solution of a Linear Programming problem using simplex method (Since Big-M method is not included in the syllabus, avoid questions in simplex method with constraints of ≥ or = type.)

Module 2 Transportation Problems: Linear programming formulation - Initial basic feasible solution (Vogel'sapproximation method/North-west corner rule) - degen-eracy in basic feasible solution - Modified distribution method - optimalitytest.

Assignment problems: Standard assignment problems - Hungarian method for solving an assignment problem.

Module 3 Project Management: Activity -dummy activity - event - project network, CPM (solution by network analysis only), PERT.

Text: Ravindran - Philps - Solberg: Operations Research- Principles and Practice

Reference:

Hamdy A Taha: Operations Research

Distribution of instructional hours:

Module 1: 18 hours; Module 2: 18 hours; Module 3: 18 hours

Semester V

Business Mathematics (Open Course)

Code: MM 1551.2 Instructional hours per week: 3
No. of Credits: 2

Module 1 Basic Mathematics of Finance: Nominal rate of Interest and eff ective rate of inter-est, Continuous Compounding, force of interest, compound interest calculations at varying rate of interest, present value, interest and discount, Nominal rate of discount, eff ective rate of discount, force of discount, Depreciation.

(Chapter 8 of Unit I of text- Sections: 8.1, 8.2, 8.3, 8.4. 8.5, 8.6, 8.7, 8.9)

Module 2 Diff erentiation and their applications to Business and Economics: Meaning of derivatives, rules of diff erentiation, standard results (basics only for doing problems of chapter 5 of Unit 1) (Chapter 4 of unit I of text- Sections: 4.3, 4.4, 4.5, 4.6)

Maxima and Minima, concavity, convexity and points of inflection, elasticity of demand, Price elasticity of demand (Chapter 5 of Unit I of text - Sections: 5.1, 5.2, 5.3, 5.4, 5.5. 5.6, 5.7)

Integration and their applications to Business and Economics: Meaning, rules of integration, standard results, Integration by parts, definite integration (basics only for doing problems of chapter 7 of Unit 1 of text) (Chapter 6 of unit I of text: Sections: 6.1, 6.2, 6.4, 6.10, 6.11)

Marginal cost, marginal revenue, Consumer's surplus, producer's surplus, con-sumer's surplus under pure competition, consumer's surplus under monopoly (Chap-ter 7 of unit I of text- Sections: 7.1, 7.2, 7.3, 7.4, 7.5)

Module 3 Index Numbers: Definition, types of index numbers, methods of construction of price index numbers, Laspeyer's price index number, Paasche's price index num-ber, Fisher ideal index number, advantages of index numbers, limitations of index numbers

(Chapter 6 of Unit II of text- Sections: 6.1, 6.3, 6.4, 6.5, 6.6, 6.8, 6.16, 6.17)

Time series: Definition, Components of time series, Measurement of Trend (Chap-ter 7 of Unit II of text - Sections: 7.1, 7.2, 7.4)

Text: B M Aggarwal: Business Mathematics and Statistics Vikas Publishing House, New Delhi, 2009

References:

1. Qazi Zameeruddin, et al : Business Mathematics , Vikas Publishing House, New Delhi, 2009

2. Alpha C Chicny, Kevin Wainwright: Fundamental methods of Mathematical Economics ,Mc-Graw Hill, Singapre, 2005

Distribution of instructional hours:

Module 1: 18 hours; Module 2: 18 hours; Module 3: 18 hours

Semester V

Actuarial Science (Open Course)

Code: MM 1551.3 Instructional hours per week: 3

No. of Credits: 2

Module 1 : Introduction to Insurance Business: What is Actuarial Science? Concept of Risk, Role of statistics in Insurance, Insurance business in India.

Introductory Statistics: Some important discrete distributions, Some important continuous distributions, Multivariate distributions

Module 2 : Feasibility of Insurance business and risk models for short terms: Expected value principle, Notion of utility,risk models for short terms

Future Lifetime distribution and Life tables: Future life time random variable, Curate future-life time, life tables, Assumptions for fractional ages, select and ultimate life tables.

Module 3 : Actuarial Present values of benefit in Life insurance products: Compound interest, Discount factor, Benefit payable at the moment of death, Benefit payable at the end of of year of death, relation between A and A.

Annuities, certain, continuous life annuities, Discrete life annuities, Life annuities with m^{th} ly payments.

Text: Shylaja R. Deshmukh : Actuarial Statistics University press, Hyderabad, 2009. Chap-ters 1 - 6.

References:

1. Bowers, Jr., N. L et al: Actuarial Mathematics , 2^{nd} Edition,The society of Actuaries, Illinois, Sahaumberg,1997
2. Palande, P. S. et al: Insurance in India: Changing policies and Emerging Oppertunities ,Response Books, New Delhi, 2003
3. Purohit, S. G. et al: Statistics Using R ,Narosa, New Delhi, 2008
4. www.actuariesindia.org

Distribution of instructional hours:

Module 1: 12 hours; Module 2: 21 hours; Module 3: 21 hours

Semester VI

Real Analysis II

Code: MM 1641 Instructional hours per week: 5

No.of credits: 4

Text : R. G. Bartle, D. R. Sherbert, Introduction to Real Analysis, Third Edition, Wiley

This course builds on the first course in Real Analysis done earlier and concentrates on real valued functions. We discuss the three properties of continuity, diff erentiability and Riemann integrability. The history of how calculus developed must also be discussed (see en.wikipedia.org/wiki/History_of_calculus, for example).

Module 1

The intuitive geometric notion of continuity as an unbroken curve seen in the calculus course must be recalled and then the discussion should gradually lead to the -δ definition, as an eff ort to make this notion formal and rigorous. The connexion between continuity and existence of limit should be emphasized. The material contained in Sections 5.1–5.3 and Section 5.6 of the textbook forms the core of this part of the course. Section 5.4, Uniform Continuity and Section 5.5, Continuity and Gauges, need not be discussed.

Module 2

Diff erentiation and integration are extensively discussed in an earlier Calculus course, with a strong emphasis on computation. Here we take another look at diff erentiation from a conceptual point of view. It is based on Chapter 6 of the textbook. All the four sections of this chapter are to be discussed in detail.

Module 3

In this module, we discuss Riemann's theory of integration. It is based on Sections 7.1–of the text. Section 7.4, Approximate Integration need not be discussed.

Students have already seen integration as anti-diff erentiation and informally as the limit of sums in the calculus couse. All these idea are made more precise here. The historical evolution of the ideas leading to Riemann integral can be found in en.wikipedia.org/wiki/ Integral#History. The diff erences between anti-diff erentiation and Riemann's theory of integration should be stressed. Section 7.3 of the textbook must be seen as establishing the links between anti-diff erntiation and Riemann integration, Examples 7.3.2(e) and 7.3.7(a), (b) are significant in this context.

References

1. A. D. Alexandrov et al., Mathematics:Its Content, Methods and Meaning, Dover

2. R. Dedekind, Essays on The Theory of Numbers, available as a freely dowloadable e-book at http://www.gutenberg.org/etext/21016)

3. W. Rudin, Principles of Mathematical Analysis, Second Edition, McGraw-Hill

4. A. E. Taylor, General Theory of Functions and Integration, Dover

Distribution of instructional hours:

Module 1: 30 hours; Module 2: 30 hours; Module 3: 30 hours

Semester VI

Linear Algebra

Code: MM 1642 Instructional hours per week: 4

No.of credits: 3

Text : Thoma Banchoff and John Wermer, Linear Algebra Through Geometry, Second Edition, Springer

In this course we introduce the basics of linear algebra and matrix theory with emphasis on their geometrical aspects. It is based on the Chapters 1–4 of the text.

Module 1

In this module we bring together some aspects of analytic geometry of two dimensions, solutions of simultaneous in two unknowns and theory of 2×2 matrices under the unified theme of linear transformations of the plane. It is based on Chapters 1 and 2 of the text.

Module 2

The ideas in the first module are extended to three dimensional space in this module. It is based on Chapter 3 of the text

Module 3

The concepts discussed in the first two modules are generalized to arbitrary dimensions in this module. It is based on Chapter 4 of the text.

Text: References:

1. T S Blyth and E F Robertson: Linear Algebra, Springer, Second Ed.
2. R Bronson and G B Costa: Linear Algebra, Academic Press, Seond Ed.
3. David C Lay: Linear Algebra, Pearson
4. K Hoff man and R Kunze: Linear Algebra, PHI

Distribution of instructional hours:

Module 1: 24 hours; Module 2: 24 hours; Module 3: 24 hours

Semester VI

Complex Analysis II

Code: MM 1544 Instructional hours per week: 3

No.of credits: 3

Texts 1. Joseph Bak and Donald J. Newman, Complex Analysis. Third Edition, Springer

2. James Brown and Ruel Churchill, Complex Variables and Applications, Eighth Edi-tion, McGraw-Hill

In this course, we consider some of the basic properties of functions analytic in a disc or on a punctured disc. It is based on parts Chapters 6, 9, 10, 11 of [1] and Chapters 6 and 7 of [2].

Module 1

We start with Sections 6.1 and 6.2 of [1]. In Section 6.1, only the statement of 6.5 Power Series Representation for Functions Analytic in a Disc need be given; the proof need not be discussed. But it should be linked to 2.10 Corollay to note that a function analytic in a disc is infinitely diff erentiable in it and with 2.11 Corollary to see how the coefficients of the series are related to the derivatives of the function. Section 6.3 need not be discussed.

We then pass on to a discussion of isolated singular points and residues, as in Chapter 6 (Sections 68–77). Here and elsewhere, all examples and exercises involving logarithms must be skipped.

Module 2

In this module, we consider the application of the Residue Theorem in the evaluation of some integrals. as in Chapter 7 of [2]. Only Sections 78–82 and Section 85 need be discussed. Sections 83–84 and Sections 86–89 need not be considered.

Section 11.2 of [1], Application of Contour Integral Methods to Evaluation and Estimation of Sums, must also be discussed, along with the relevant exercises in this section.

References:

1. Ahlfors, L. V, Copmlex Analysis, McGraw-Hill, 1979.
2. J M Howie, Complex Analysis, Springer

Distribution of instructional hours:

Module 1: 27 hours; Module 2: 27 hours

Semester VI

Abstract Algebra II

Code: MM 1544 Instructional hours per week: 3

No.of credits: 3

Text: John B. Fraleigh, A First Course in Abstract Algebra. Seventh Edn, Narosa

In this course, we discuss more of group theory and also the basics of ring theory. It is based on parts of Chapters II–V of the text. As in the first course, due emphasis must be given to problem solving.

Module 1

In this part of the course, we discuss homomorphism of groups and factor groups, as in Sections 13–15 of the text. The last two parts of Section 15, Simple Groups and The Center and Commutator Subgroups need not be discussed..

Module 2

We start by recalling the definition of rings, seen in an earlier course on algebra. Then Sec-tions 18-20 must be discussed in detail. Sections 21–25 need not be discussed, But Section 26 on homomorphisms and factor rings must be done in full.
References:

1. I N Herstein, Topics in Algebra, Vikas Publications
2. J A Gallian, Contemporary Abstract Algebra, Narosa Publications
3. D A R Wallace, Groups, Rings and Fields, Springer

Distribution of instructional hours:

Module 1: 27 hours; Module 2: 27 hours

Semester VI

Computer Programming

Code: MM 1541 Instructional hours per week: 5

No.of credits: 4

In this course, we teach document preparation in computers using the LaTeX typesetiing program and also the basics of computer programming using Python. Since the operatig system to be used is gnu/Linux, fundamentals of this os are also to be discussed.

Module 1

Text : Matthias Kalle Dalheimer and Matt Welsh, Running Linux, Fifth Edition, O'Reilly

In this module, we consider the fundamentals of the gnu/Linux operating system. It is based on Chapter 4, Basic Unix Commands and Concepts, of the text. Students should be taught about the Linux directory structure and the advantages of keeping their files in well structured directories. Since they will be using the command line interface most of the time, this entails facility in using such commands as mkdir, pwd, cd, ls, cp, mv, ls and so on.

Module 2

Text : LaTeX Tutorials—A Primer by Indian TeX Users Group

In this module, we discuss computer typesetting using LaTeX, Chapters 1–2 of the text must be discussed in full. On bibliography, only the first section of Chapter 3 need be discussed. Also, only the first section of Chapter 4—on table of conetents–need be done. Chapters 6–9 are to be done in full. Finally Chapter 12 also is to be discussed in full.

Module 3

Text : Vernon L. Ceder, The Quick Python Book, Second Edition, Manning

It is based on Chapters 3–9 of the text. The concepts in Chapters 3–8 must be discussed in full, but in Chapter 9, only Sections 9.1–9.5 need be discussed.

The programs done in class should all have a mathematical content. SOme possibilities are listed below:

- Factorial of a number
- Checking primality of a number

- Listing all primes below a given number
- Prime factorization of a number
- Finding all factors of a number
- gcd of two numbers using the Euclidean Algorithm
- Finding the multiples in Bezout's Identity

Distribution of instructional hours:

Module 1: 30 hours; Module 2: 30 hours; Module 3: 30 hours

Semester VI

Graph Theory (Elective)

Code: MM 1661.1 Instructional hours per week: 3

No. of credits: 3

Overview of the Course: The course has been designed to build an awareness of some of the fundamental concepts in Graph Theory and to develop better understanding of the subject so as to use these ideas skillfully in solving real world problems.

Module 1 A brief history of Graph Theory: The K¨onigsberg bridge problem, the history of the Four Colour Theorem for maps, Contributions to Graph Theory by Euler, Kirchoff , Cayley, Mobius, De Morgan, Hamilton, Erd¨os, Tutte, Harary, etc. (A maximum of three hours may be allotted to this sub-module. In addition to sections 1.2 and 1.6 of the text, materials for this part can be had from other sources including the internet.)Graphs: Definition of graph, vertex, edge, incidence, adjacency, loops, parallel edges, simple graph. Representation of graphs, diagrammatic representation, matrix representation (adjacency* matrix and incidence matrix only). Finite and infinite graphs, Definition of directed graphs, illustrative examples, Directed graphs, Applications of graphs. [sections 1.1, 1.2, 1.3, 1.4, 7.1, 9.1, 9.2]Degree of a vertex, odd vertex, even vertex, relation between sum of degrees of vertices and the number of edges in a graph, and its consequence: number of odd vertices in a graph is even. Isolated vertex, pendant vertex, null graph, complete graphs [page 32], bipartite graphs [page 168], complete bipartite graph [page 192-prob 8.5], regular graph, complement* of a graph, graph isomorphisms, self comple-mentary* graphs, illustrative examples. [sections 1.4, 1.5, 2.1]Sub-graphs, edge disjoint sub-graphs, spanning sub-graphs*, induced subgraphs [sections 2.2]The decanting problem and its graph model [no solution at this point]. The puzzle with multicolour cubes [problem 1.8 and section 2.3].

Module 2 Walks, open walks, closed walks, paths, circuits, end vertices of a path, path joinig two vertices, length of a path, connected and disconnected graphs. Components of a graph. [sections 2.4, 2.5]Euler line, Euler graph, unicursal line, unicursal graph, characterisaion of Euler graph, Concept of Euler digraph [section 2.5, 9.5], Solution of the decanting problem. The K¨onigsberg problem, the Chinese postman problem* and the Teleprinter's problem, their graph models and solutions. [problem 1.8 and sections 2.3, 1.2, 9.5]

Module 3 Trees- properties of trees, distance, eccentricity, center, radius, diameter, spanning tree, illustrative examples. [sections 3.1, 3.2, 3.3, 3.4, 3.7]Planar graphs exam-ples of planar and non-planar graphs, diff erent representations of a planar graph. Regular polyhedra, Euler's polyhedral formula. [Theorem 5.6, without proof] .

Illustrative examples, Kuratowski's graphs and their importance in the theory of planar graphs, forbidden sub-graph,

characterisaion of planar graph [Kuratowski's theorem, Theorem 5.9, without proof], illustrative examples-both planar and non-planar. [sections 5.2, 5.3, 5.4, 5.5] Graph theoretic version of the Four Colour Theorem, without proof.

Text: Narsingh Deo: Graph Theory with applications for Engineering and Computer Science, Prentice Hall of India Pvt. Ltd., 2000.

References:

1. BalakrishnanR and Ranganatahan: A Text Book of Graph Theory, Springer
2. Body J A and Murthy U S R:Graph Theory with Applications, The Macmillan Press
3. Harary F: Graph Theory, Addison-Wesley
4. Vasudev C: Graph Theory with Applications
5. West D B: Introduction to Graph Theory, Prentice Hall of India Pvt. Ltd.

Note: Generally, the references are from NARSINGH DEO. Those marked with an asterisk are found elsewhere.Distribution of instructional hours:

Module 1: 18 hours; Module 2: 18 hours; Module 3: 18 hours

Semester VI

Fuzzy Mathematics (Elective)

Code: MM 1661.2 Instructional hours per week: 3

No. of credits: 2

Module 1 From crisp sets to fuzzy sets: a paradigm shift.Introduction-crisp sets: an overview-fuzzy sets: basic types and basic concepts of fuzzy sets, Fuzzy sets versus crisp sets, Additional properties of cuts, Representation of fuzzy sets.

Module 2 Operations on fuzzy sets and Fuzzy Arithmetic:Operations on fuzzy sets-types of operations, fuzzy complements, fuzzy intersections, t-norms, fuzzy unions, t-conorms.

Fuzzy numbers, Linguistic variables, Arithmetic operations on intervals, Arithmetic operations on fuzzy numbers.

Module 3 Fuzzy relations :Crisp versus fuzzy relations, projections and cylindric extensions, Binary fuzzy relations, Binary relations on a single set, Fuzzy equivalence relations.

Text: George J Klir and Yuan: Fuzzy sets and fuzzy logic: Theory and applications, Prentice Hall of India Pvt. Ltd., New Delhi, 2000.

Chapter 1: Sections 1.1 to 1.4
Chapter 2: Sections 2.1 and 2.2
Chapter 3: Sections 3.1 to 3.4
Chapter 4: Sections 4.1 to 4.4
Chapter 5: Sections 5.1 to 5.5

References:

1. Klir G J and T Folger: Fuzzy sets, Uncertainty and Information, PHI Pvt.Ltd., New Delhi, 1998
2. H J Zimmerman: Fuzzy Set Theory and its Applications, Allied Publishers, 1996.
3. Dubois D and Prade H: Fuzzy Sets and Systems: Theory and Applications, Ac.Press, NY, 1988.

Distribution of instructional hours:

Module 1: 18 hours; Module 2: 18 hours; Module 3: 18 hours

Semester VI

Mechanics (Elective)

Code: MM 1661.3 Instructional hours per week: 3
No. of credits: 2

Part A: STATICS

Module 1 Introduction, composition and resolution of forces, parallelogram law of forces, triangle law of forces, Lami's theorem, polygon of forces, λ−μ theorem, resultant of a finite number of coplanar forces acting upon a particle, conditions of equilibrium, parallel forces, resultant of two parallel forces acting upon a rigid body, moments, moments of a force about a point and about an axis, generalized theorem of moments.

Module 2 Couples, equilibrium of a rigid body acted on by three coplanar forces, general conditions of equilibrium of a rigid body under coplanar forces, friction, laws of friction, limiting friction, coefficient of friction and simple problems.

Part B : DYNAMICS

Module 3 Velocity, relative velocity, acceleration, parallelogram laws of acceleration, motion under gravity, Newtons laws of motion and their applications to simple problems. Impulse, work, energy, kinetic and potential energies of a body, principle of con-servation of energy.

Module 4 Projectiles, Range on an inclined plane, Collision of elastic bodies, Newton's ex-perimental law, Impact of sphere on a plane, Direct and oblique impact of two spheres, Loss of kinetic energy by impact, Simple harmonic motion, Examples of simple harmonic motion, Simple pendulum.

Text: by S.L. Loney, The Elements of Statics and Dynamics, Part-I and
Part-II, AITBSPublications and distributions (Regd), Delhi
Distribution of instructional hours:

Module 1: 15 hours; Module 2: 12 hours; Module 3: 15 hours, Module 4: 12 hours

FIRST DEGREE PROGRAMME UNDER CBCSS
REVISED SCHEME AND SYLLABI FOR B. Sc. (Complementary) STATISTICS FOR MATHEMATICS CORE

The goal of the syllabus is that students understand statistics by using it effectively in real life situations. It is aimed that students have experience of the application of statistical methods to analyze data and get acquainted with situations where statistical thinking is helpful. Emphasis is given to practical- data collection and use of appropriate statistical tools to analyze them. There has to be lectures supported by problem sheets. There are practical sessions associated with each semester. Numerical problem solving using scientific calculators is also included in the ESE of Courses I, II,III & IV. There is a component of one course in practical using Excel during Semester IV.

ESE of course I, II, III, & IV will be of 3 hours duration and have questions from all modules. Courses I & II will be of 2 credits each, III &IV will be of 3 credits each. The complementary course V viz., Practical using Excel in Semester IV will be of 2 hours duration of credit 4. Students are required to produce the fair record of practical done (module V of courses I, II, III and module IV of course IV) and print out of output of practical- course V of semester IV duly certified by the teacher concerned. Presenting the certified record is mandatory to appear for the practical examination. Complementary course V will be computer based, ESE will be held under the supervision of external examiners duly appointed by the University.

Sem	Title of the Course	Hrs/week		No. of Credits	Total Hrs/Sem	ESE Duration	Evaluation weightage	
		L	P				CE	ESE
4.	ST 1131.1: Descriptive Statistics and Introduction to Probability	2	2	2	72	3 hrs.	20%	80%
II	ST 1231.1: Random Variables	2	2	2	72	3 hrs.	20%	80%
III	ST 1331.1: Probability Distributions and Theory of Estimation	3	2	3	90	3 hrs.	20%	80%
IV	ST 1431.1: Testing of Hypotheses and Analysis of Variance	3	2	3	90	3 hrs.	20%	80%
	ST 1432.1: Practical using Excel			4		2 hrs.	20%	80%

SEMESTER I

Hours/week: 4

Course I – ST 1131.1: Descriptive Statistics and Introduction to Probability

The course aims that students will learn to understand characteristics of statistical data and will get acquainted with describing data through illustrating examples and exercises. They will also learn to collect, organize and summarize data, create and interpret simple graphs and compute appropriate summary statistics accurately.

Module I: Introduction: Nature and uses of Statistics in various disciplines, Limitations and misuse of Statistics. Types of Data: Concepts of primary data and secondary data, population and sample; Classification of data based on geographic, chronological, qualitative and quantitative characteristics, time-series data, discrete and continuous data, different types of scales-Nominal, Ordinal, Ratio and Interval (5 H)

Collection of Data: Methods of collecting primary data – Preparation of questionnaires, checking consistency of data. Secondary data –major sources and limitations; Census and Sample Surveys; Methods of sampling: SRSWR&SRSWOR, sampling and non sampling errors; Presentation of raw data: Classification and tabulation - Construction of Tables with one or more factors of classification, frequency distributions relative and cumulative frequency distributions, their graphical representations; Charts and diagrams: stem and leaf chart, box plot, One dimensional and two dimensional diagrams (15 H)

Module II: Types of descriptive statistics : Central tendency- mean, median, mode, geometric mean, harmonic mean and their properties; Dispersion- absolute and relative measures- Range, quartile deviation, mean deviation and standard deviation, coefficient of variation; Momentsraw and central; Skewness, Kurtosis and their measures (20 H)

Module III: Random experiments: sample point and sample space- discrete and continuous, event, operations of events, concepts of equally likely, mutually exclusive and exhaustive events (10 H)

Module IV: Probability: Relative frequency and classical approaches, Axiomatic approach, theorems in probability, probability space, conditional probability, multiplication theorem, independence of two and three events, compound probability, Baye's theorem and its applications (22 H)

Module V: Practical based on Modules I, II, III, & IV – Preparation of questionnaire and data collection, Data analysis: presentation of data, calculation of descriptive statistics, Algebra of events and Probability

References

4. **Bhat B.R. (1985): Modern Probability Theory, New Age International (P) Ltd**
5. **Gupta S.C. and Kapoor V.K. (1980): Fundamentals of Mathematical Statistics, Sultan Chand and Sons, Delhi.**
6. **Gupta S. P. (1989): Statistical Methods, Sultan Chand & Sons, Delhi**
7. **Jim Pitman(1996):Probability,Narosa Publishing House, New Delhi**
8. **Kenny J. F & Keeping E. S (1954): Mathematics of Statistics –Part I DVan Nostard & Company, New Delhi-1**
9. **Parimal Mukhopadhyay(1996): Mathematical Statistics, New Central Book Agency (P) Ltd, Calcutta.**

SEMESTER II

Hours/week: 4

Course II – ST 1231.1: Random Variables

This course will introduce the student the elementary ideas of random variables, probability models and concepts including variables and measures of various characteristics.

Module I: Random variables: discrete and continuous, probability mass function (pmf) and probability density function (pdf), distribution function (df), joint distribution of two random variables, marginal and conditional distributions, independence, transformation of variablesone- to-one transformation of discrete and continuous type of one random variable (20 H)

Module II: Expectation of random variables and its properties, theorems on expectation of sums and product of independent random variables, conditional expectation, moments, moment generating function, characteristic function, their properties and uses; Bivariate moments, Cauchy- Schwartz inequality and correlation coefficient (17 H)

Module III: Bivariate data: Scatter diagram, Fitting of curves - Principle of least squares, fitting of straight line, fitting parabola, curves $y = ab^x$, $y = ax^b$, $y = ae^{bx}$ and $y = \frac{a}{x} + b$ (17 H)

Module IV: Straight line regression and prediction, Karl Pearson's coefficient of correlation, Spearman's rank correlation (18 H)

Module V: Practical based on Modules I, II, III, & IV –random variables (univariate and bivariate), expectations, moments and curve fitting, correlation and regression

References

6. **Bhat B.R. (1985): Modern Probability Theory, New Age International (P) Ltd**
7. **Gupta S.C. and Kapoor V.K. (1980): Fundamentals of Mathematical Statistics, Sultan Chand and Sons, Delhi.**
8. **Jim Pitman(1996):Probability,Narosa Publishing House, New Delhi**
4. **Parimal Mukhopadhyay(1996): Mathematical Statistics, New Central Book Agency (P) Ltd, Calcutta.**
5. **Rohatgi V. K.(1993): An introduction to probability theory and Mathematical statistics, Wiley Eastern, New Delhi.**

SEMESTER III

Hours/week: 5

Course III – ST 1331.1: Probability Distributions and Theory of Estimation

This course introduces basic (standard) probability models, limit theorems, sampling distributions, the logic of statistical inference and the related methods of statistical estimation. The students should be able to use statistical tables and judge the quality of estimators.

Module I: Univariate probability distributions- uniform (discrete), binomial, Poisson, geometric, hypergeometric, uniform (continuous), exponential, gamma, beta, normal (25 H)

Module II: Chebychev's inequality, Law of large numbers, central limit theorem for iid random variables-statement and applications (20 H)

Module III: Sampling distributions -Parameter and statistic, Sampling distributions-normal, (chi-square), t and F distributions (Derivation required only for the sampling distribution of the mean of a normal population) (20 H)

Module IV: Point estimation - Properties of estimators – unbiasedness, consistency, efficiency, sufficiency, minimum variance and Cramer-Rao inequality Methods of estimation of mean, variance and proportion, - Least square method, Maximum likelihood method, method of moments, MVUE and attainment of Cramer-Rao lower bound ; Interval estimation of single unknown parameter-estimation of mean, variance and proportion (25 H)

Module V: Practical (numerical problems) based on Modules I, II, III, & IV – Discrete and continuous probability distributions and applications, law of large numbers and CLT, Point Estimation and interval estimation.

References

6. **Medhi J.(2005): Statistical Methods-an introductory text, New Age International (P) Ltd, New Delhi.**
7. **Gupta S.C. and Kapoor V.K. (1980): Fundamentals of Mathematical Statistics, Sultan Chand and Sons, Delhi.**
8. **John E. Freund(1980): Mathematical Statistics, Prentice Hall of India.**
9. **Parimal Mukhopadhyay(1996): Mathematical Statistics, New Central Book Agency (P) Ltd, Calcutta.**
10. **Rohatgi V.K(1993), An Introduction to probability theory & Mathematical Statistics Wiley-Eastern, New Delhi.**

SEMESTER IV

Hours/week: 5

Course IV - ST 1431.1: Testing of Hypotheses and Analysis of Variance

This course enables to understand statistical significance of testing of hypothesis, communicate conclusions and interpretations. Introduction of concepts of analysis of variance is also aimed at.

Module I: Theory of testing of Hypothesis- statistical hypotheses, simple and composite hypotheses, two types of errors, tests of significance, significance level, p-value and power of a test, UMP test Neyman-Pearson lemma (25 H)

Module II: Continuation of testing of hypotheses- large sample tests, small sample tests based of normal, Chi square(), t and F statistics, Testing independence of attributes and homogeneity, Fitting binomial, Poisson and normal distributions and testing goodness of fit (25 H)

Module III: Analysis of variance- assumptions, analysis of one way and two way classified data (20 H)

Module IV: Practical (numerical problems) based on Modules I, II & III- Testing of hypotheses and analysis of variance

References

4. **Das M. N., Giri N. C.(2003) Design and analysis of experiments, New Age International (P) Ltd, New Delhi.**
5. **John E. Freund(1980): Mathematical Statistics, Prentice Hall of India, New Delhi.**

5. Medhi J. (2005): Statistical Methods-an introductory text ,New Age International(P) Ltd., New Delhi.

6. Paul G. Hoel, Sidney C. Port, Charles J. Stone(1971): Introduction to statistical theory, Universal Book stall, New Delhi.

Course V - ST 1432.1: Practical using Excel

The students will learn to use statistical tools available in Excel and have on hand training in data analysis. This course covers topics of courses I, II, III & IV.

Module I: Use of Excel in statistics (Charts, functions and data analysis), Practical covering Semesters I, II, III, & IV (20 H)

Charts- column, pie & scatter

Functions- Evaluation of numerical problems using the following functions

AVEDEV	AVERAGE	BINORMDIST	CHIDIST	CHINV	CHITEST
CONFIDENCE	CORREL	COVAR	DEVSQ	FDIST	FINV
FREQUENCY	FTEST	GEOMEAN	HARMEAN	INTERCEPT	KURT
MEDIAN	MODE	LINEST	LOGEST	NORMDIST	NORMINV
NORMSDIST	PEARSON	POISSON	PROB	SKEW	SLOPE
STANDARDIZE	STDEVP	TDIST	TINV	TREND	TTEST

Data analysis- Use of the following tools in Data Analysis

Histogram Descriptive Statistics Covariance Correlation Regression Random Number Generation Sampling t-test Paired Two Sample for mean t-test: Two Sampling Assuming Equal Variances z-test: Two Sample for Means F-test Two Sample for Variances Anova- Single Factor and Two Factor without Replication

References

3. Dan Remenyi, George Onofrei, Joe English (2010): An Introduction to Statistics Using Microsoft Excel, Academic Publishing Ltd., UK

4. Neil J Salkind (2010): Excel Statistics, A Quick Guide, SAGE Publication Inc. New Delhi

5. Vijai Gupta(2002): Statistical Analysis with Excel, VJ Books Inc. Canada

Record of Practical

Presenting the certified record is mandatory to appear for the practical examination. Five questions are to be worked out in each sheet based on the topics in the syllabus as follows:

3. Diagrams and Graphs
4. Measures of Central Tendency and Dispersion
5. Moments, Skewness and Kurtosis
6. Probability
7. Univariate Random Variables
8. Bivariate Random Variables

5. **Mathematical Expectation**
6. **Bivariate Moments**
7. **Fitting of Curves**
8. **Correlation and Regression**
9. **Standard Distributions- Discrete**
10. **Standard Distributions- Continuous**
11. **Law of Large Numbers**
12. **Sampling Distributions**
13. **Point Estimation**
14. **Interval Estimation**
15. **Large Sample Tests**
16. **Small Sample Tests**
17. **Analysis of Variance**
18. **Charts in Excel**
19. **Functions in Excel**
20. **Analysis Tools in Excel**

Print out of output of practical sheets 20, 21 and 22 are to be attached. CE and ESE marks are to be awarded and consolidated as per regulations of the FDP in affiliated Colleges, 2013.

Complementary Course I
FUNDAMENTALS OF FINANCIAL ACCOUNTING (CO-1131)

No. of instructional hours per week : 3
No. of credits : 2
Aim of the course: To provide a basic accounting knowledge as applicable to business and to form a background for higher learning in financial accounting.
Course objectives:
l. To enable the students to acquire knowledge in the basic principles and practices of financial accounting.
2. To impart skills for recording various kinds of business transactions and preparing ledgers.
Module I
Forms of business organisations: Business for profit and non- profit organizations. Business entities – individual, partnerships, co- operatives, trusts, undivided families, joint stock companies, joint ventures and MNCs. (Basic concepts only) (10 hrs)
Module II
Introduction to financial accounting - Accounting - meaning, objectives- accounting concepts and conventions -systems of accounting. Double entry book keeping-basic concepts-rules of debit and credit. (12hrs)

Module III

Recording Business Transactions - Journal – Ledger - Subsidiary books. (10hrs)

Module IV

Cash book -Simple cash book, cash book with cash and discount columns, cash book with cash, discount and bank columns - Petty Cash Book (12 hrs)

Module V

Trial Balance - meaning and objectives - preparation of Trial Balance (10hrs)

Books Recommended:

1. Naseem Ahmed, Nawab Ali Khan and M.L. Gupta. *Fundamentals of Financial Accounting - Theory and Practice*, Ane Books Pvt, Ltd., New Delhi,

2 Krishnankutty Menon M. and George Chakola. *Principles of Book-Keeping And Accountancy*, Sahitya Bhawan Publications, Agra.

3. Gupta R.L. and Gupta V.K. *Principles and Practice of Accountancy*. Sultan Chand & Sons, New Delhi.

4. Jain S.P. and Narang K.L. *Basic Financial Accounting*. Kalyani Publishers. New Delhi.

5. Maheswari S.N and Maheswari S.K. Advanced Accounting-Vol.1. Vikas Publishing House, New Delhi.

Complementary Course ll
ADVANCED FINANCIAL ACCOUNTING (CO-1231)

No. of instructional hours per week : 3

No. of credits : 2

Aim of the course: To familiarize the students with the preparation of financial accounts of different forms of business organization.

Course objective:

To familiarise the students with the system of accounting for sole proprietorships, non-profit organizations and partnership firms.

Module I

Financial Statements - Final accounts of sole trader - Manufacturing, Trading and Profit and Loss Account - Balance Sheet- Preparation of final accounts with simple adjustments with regard to expenses and income, bad and doubtful debts and closing stock. (18hrs)

Module II

Accounts of Non-Profit Organisations - capital and revenue- preparation of Receipts and Payments Account, Income and Expenditure Account and Balancesheet (18 hrs)

Module III

Partnership Accounts - Introduction - features - fixed and fluctuating capitals - distribution of profits/ losses - final accounts. (10hrs)

Module IV

Accounting Errors : Types – errors of omission, errors of commission, errors of principle, compensating errors ; effect of errors. (Theory only) (4hrs)

Module V

Accounting Standards – concept and importance. International Financial Reporting System (IFRS) – concept and importance. (4hrs)

Books Recommended:

l. Gupta R.L. and Radhaswamy. M, *Advanced Accountancy,* Sultan Chand & Sons. New Delhi.
2. Shukla M.C., Grewal T.S and Gupta S.C. *Advanced Accounts,* S. Chand & Co. Ltd.. New Delhi.
3. Jain S.P. and Narang, K.L. *Advanced Accountancy* . Kalyani Publishers, New Delhi.
4. Naseem Ahmed. Nawab Ali Khan and Gupta M.L. Fundamentals of Financial Accounting Theory and Practice, Ane Books Pvt. Ltd., New Delhi.
5. Maheswari S.N. and Maheswari S.K, *Advanced Accountancy,* Vikas Publishing House. New Delhi.

Complementary Course III
COST ACCOUNTING(CO- 1331.1)

No. of instructional hours per week : 5

No. of credits : 3

Aim of the course: To impart knowledge of cost accounting system and acquaint the students with the measures of cost control.

Course objectives:

l. To familiarise the students with cost concepts.
2.To make the students learn the fundamentals of cost accounting as a separate system of accounting.

Module I

Introduction to Cost Accounting - Meaning and definition - cost concepts – cost centre, cost unit, profit centre, cost control, cost reduction - objectives - Distinction between financial accounting and cost accounting - Methods and Techniques of costing - advantages of cost accounting -limitations of cost accounting - Installation of costing system. (15 hrs)

Module ll

Accounting and control of material cost - Documentary Design- EOQ - levels of inventory. Methods of pricing of issues. ABC, VED and FSN analysis - perpetual and periodical inventory system - continuous stock taking - material losses – types (theory only) (20 hrs)

Module III

Accounting and control of labour cost -time keeping - time booking - systems of wage payment - incentive plans- idle time - overtime and their accounting treatment - labour turn over. (20hrs)

Module IV

Accounting for overheads - classification- departmentalisation (allocation and apportionment) - absorption – determination of overhead rates - under / over absorption and their accounting treatment. (20hrs)

Module V

Cost accounting records - Preparation and presentation of cost sheets . (15hrs)

Books Recommended:

1. Jain S.P and Narang K.L. *Advanced Cost Accounting*, Kalyani Publishers, New Delhi.
2, Prasad N. K. *Advanced Cost Accounting*, Book Syndicate Pvt. Ltd., Kolkata.

3. Khan.M.Y. and Jain PK, *Advanced Cost Accounting*, Tata McGraw-Hill Publishing Co. Ltd., New Delhi.
4. Thulsian P.C. *Practical Costing*, Vikas Publishing House, New Delhi
5. Arora M.N *Principles and Practice of Cost Accounting*. Vikas Publishing House. New Delhi.
6. Nigam B.M. and Jain K. *Cost Accounting*, PHI, New Delhi.
7. Maheswari S N. *Cost and Management Accounting*. Sultan Chand & Sons, New Delhi.

Complementary Course IV E- COMMERCE CO-1431.1

No. of instructional hours per week: 4
No. of credits: 3

Aim of the course: To familiarise the students with the emerging developments in Commerce and Industry.

Course objectives:

1. To review the basic concepts and functional knowledge in the field of E-Commerce.
2. To expose the students to computer applications in the field of e -commerce.

Module I

Introduction to E- Commerce- emergence of the internet- commercial use of the internet- emergence of world wide web- advantages and disadvantages of e-Commerce- transition to E- Commerce in India- E -Commerce opportunities for industries (9hrs)

Module II

Models- Business models for E- Commerce - Models based on Relationship of transaction parties: B2C, B2B, C2C, C2B; - Models based on the relationship of transaction types: Brokerage Model, Aggregator Model, Info –mediary Model, Community Model, Value – Chain Model , Manufacturer Model, Advertising Model, Subscription Model, Affiliate Model.
(15 hrs)

Module III

E- Marketing- traditional marketing – identifying web presence goals – browsing behaviour model – online marketing, E–Advertising - internet marketing trends- E-Branding , e- marketing strategies.
(10hrs)

Module IV

E--Security - information system security – Security on the internet- E-business risk management issues- information security environment in India
(10hrs)

Module V

E- Payment Systems – Digital payment requirements- digital token based e-payment systems – properties of electronic cash – Risk and e –payment systems – designing e – payment systems.
(10hrs)

Books Recommended:

1. Joseph P. T : *E- Commerce :An Indian Perspective*.PHI

2. Bharat Bhaskar-*Electronic Commerce,* Tata McGraw- Hill Publishing Co Ltd, New Delhi.
3. Gary P Schneider. *E- Commerce,* Thomson.
4. Alexis Leon & Mathews Leon. *Fundamentals of Information Technology,*Vikas Publishing House, New Delhi
5. Kalakota.R- *E-business- A Roadmap for Success.*
6. Afuah A and Tucci. C . *Internet Business Models and Strategies,* McGraw- Hill Publishing Co Ltd, New Delhi.
7.Stallings. *Cryptography and Network Security,*PHI, New Delhi.

Complementary Course V. Management Accounting(CO-1431.2)

No. of instructional hours per week: 5

No. of credits : 4

Aim of the Course: To develop professional competence and skills in applying accounting information for decision making.

Course Objectives

1. To convey a basic understanding on Management Accounting techniques.
2. To enable students to have a thorough knowledge in interpreting financial statements.

Module 1

Introduction to Management Accounting - meaning and relevance - distinction between Management Accounting and Financial Accounting - Installation of management accounting system - tools and techniques of management accounting - merits and limitations - role in decision- making - financial statements Analysis. (15hrs)

Module II

Analysis and interpretation of financial statements -Various forms of financial statements - vertical form - horizontal form - reading the statement- drawing of useful information - preparation of Comparative Balance Sheet and Comparative Profit and Loss account - Common- size statements –Trend analysis – interpretation of results. (25hrs)

Module III

Ratio Analysis -Relevance of accounting ratios- limitations - Balance Sheet ratios- Profit and Loss Account ratios- ratios to interpret profitability, liquidity, solvency and efficiency – computation and interpretation. (15hrs)

Module IV

Fund flow analysis and cash flow analysis – Fund flow statement- meaning and uses - preparation of Fund Flow statement. Cash flow statement - meaning and uses. preparation of cash flow statement.(Only simple statements needed for basic understanding.**)** (20hrs)

Module V

Budgeting -Meaning – uses – functional budgets – preparation of cash budget – flexible budget – meaning and concept of master budget. – budgeting techniques-ZBB (15hrs)

Books Recommended:

1. Man Mohan, Goyal.S.N : *Principles of Management Accounting,* Sahithya Bhavan Publications , Agra.
2. Shashi.K.Gupta and Sharma.R.K : *Management Accounting,* Kalyani Publishesrs, New Delhi.
3. Gupta.S.P and Sharma.R.K *: Management Accounting,* Sahithya Bhavan Publications , Agra.

4. Kulshustia and Ramanathan : *Management Accounting,* Sultan Chand & Sons, New Delhi.
5. Maheswari.S.N : *Management Accounting and Financial Control. ,* Sultan Chand & Sons, New Delhi.
6.Pandey I M: *Principles of Management Accounting* Vikas Publishing House New Delhi.

Course Structure of Additional Language - Malayalam for BA/B. Sc. Degree Programmes

സെമസ്റ്റർ	:	I
കോഴ്സ് കോഡ്	:	ML. 1111. 1
ലാംഗ്വേജ് കോഴ്സ്	:	II (അഡീഷണൽ ലാംഗ്വേജ് : 1)
ക്രെഡിറ്റ്	:	3

മലയാള കവിത

പുസ്തകം : കവിതാപഥം

(കേരളയൂണിവേഴ്സിറ്റി പ്രസിദ്ധീകരണം)

പഠനോദ്ദേശ്യം

മലയാള കവിതയെ സംബന്ധിച്ച സാമാന്യജ്ഞാനം വിദ്യാർത്ഥികൾക്കു നൽകുകയാണ് ലക്ഷ്യം. പഠിതാക്കളിൽ കാവ്യാഭിരുചി വളർത്തുകയും കാവ്യാസ്വാദനത്തിനും വിശകലനത്തിനും അവരെ സജ്ജരാക്കുകയും വേണം. സെമിനാർ , അസൈൻമെന്റ് തുടങ്ങിയ ഈ ലക്ഷ്യം മുന്നിൽ കണ്ടുകൊണ്ടായിരിക്കണം നൽകേണ്ടത്.

പാഠ്യപദ്ധതി

മൊഡ്യൂൾ: ഒന്ന്

കവിത - ആധുനിക കവിത്രയം വരെ

1. എഴുത്തച്ഛൻ - പാർത്ഥസാരഥിവർണ്ണനം ('നിറന്നഹിലികൾ' മുതൽ 'ഇളകാതെ നിന്നു കുറഞ്ഞൊരു നേരം' വരെ - 35 വരി)
2. വടക്കൻപാട്ട് - ഉണ്ണിയാർച്ചയുടെ അപേക്ഷ ('ഉണ്യാർച്ച തന്നെ വിളിക്കുന്നുണ്ടെ' മുതൽ 'ശേഷം
3. കുമാരനാശാൻ - കരുണ (ഒന്നാം ഭാഗം) ('അനുപമകൃപാനിധി' മുതൽ 'നൃത്തഗീതാദികളിലെ നൈപുണി പോലും' വരെ - 100 വരി)

മൊഡ്യൂൾ: രണ്ട്

കവിത്രയാനന്തരകവിത

4. ചങ്ങമ്പുഴ - കാവ്യനർത്തകി
5. വൈലോപ്പിള്ളി - ഊഞ്ഞാലിൽ
6. ഇടശ്ശേരി - കറുത്ത ചെട്ടിച്ചികൾ
7. അക്കിത്തം - നിത്യമേഘം

മൊഡ്യൂൾ : മൂന്ന്

ആധുനിക പൂർവ്വഘട്ടം

8. വയലാർ - എന്റെ ദന്തഗോപുരത്തിലേക്ക് ഒരു ക്ഷണക്കത്ത്
9. ഒ. എൻ. വി. കുറുപ്പ് - അഗ്നിശലഭങ്ങൾ
10. സുഗതകുമാരി - അഭിസാരിക
11. അയ്യപ്പപ്പണിക്കർ - പുരൂരവസ്

മൊഡ്യൂൾ : നാല്

ആധുനിക - ആധുനികാനന്തര ഘട്ടം

12. കടമ്മനിട്ട - കിരാതവൃത്തം
13. ബാലചന്ദ്രൻ ചുള്ളിക്കാട് - സന്ദർശനം
14. പി. പി. രാമചന്ദ്രൻ - രണ്ടു ശില്പങ്ങൾ
15. റഫീക്ക് അഹമ്മദ് - അമ്മത്തൊട്ടിൽ

സഹായകഗ്രന്ഥങ്ങൾ

1. കൈരളിയുടെ കഥ - പ്രൊഫ. എൻ. കൃഷ്ണപിള്ള
2. മലയാള കവിതാസാഹിത്യചരിത്രം - ഡോ. എം. ലീലാവതി
3. വർണ്ണരാജി - ഡോ. എം. ലീലാവതി
4. കടലിൽ തങ്ങിയ കാന്തരൂമി - ഡോ. ബി. വി. ശശികുമാർ
5. മുഹൂർത്തങ്ങൾ - സച്ചിദാനന്ദൻ
6. ആളൊഴിഞ്ഞ അരങ്ങ് - വി. രാജകൃഷ്ണൻ
7. വൈലോപ്പിള്ളി : എഴുത്തുംജീവിതവും - ഡോ ഇ. ബാനർജി (എഡി:)
8. ഭാവഗീതത്തിന്റെ അടയാളങ്ങൾ മലയാള കവിതയിൽ - ആർ. എസ്. രാജീവ്
9. പ്രതിബിംബങ്ങൾ പറയാതിരിക്കുന്നത് - ആർ. ശ്രീലതാവർമ്മ
10. ഹരിതദർശനം ആധുനികാനന്തര മലയാളകവിതയിൽ - ഡോ. സി. ആർ. പ്രസാദ്
11. പ്രകടനഗാനങ്ങളുടെ ആഖ്യാന സൗന്ദര്യശാസ്ത്രം - ഡോ. എൻ. അനിൽകുമാർ കേരളസാഹിത്യ അക്കാഡമി).
12. കടമ്മനിട്ടയിലെ കവി - (എഡി.) കെ. എസ്. രവികുമാർ.
13. ഹരിതനിരൂപണം മലയാളത്തിൽ - (എഡി.) ജി. മധുസൂദനൻ, കറന്റ് ബുക്സ്.
14. പരിസ്ഥിതികവിതയ്ക്കൊരാമുഖം - പി. പി. കെ. പൊതുവാൾ, ഡി. സി. ബുക്സ്.
15. കീഴാളന്റെ പ്രതിരോധതന്ത്രം - ഡോ. ഷിബ എം. കുര്യൻ.
16. കാവ്യഭാവനയുടെ സ്ത്രീപാഠങ്ങൾ - ഡോ. എ. ഷീലാകുമാരി.

സെമസ്റ്റർ	:	II
കോഴ്സ് കോഡ്	:	ML. 1211. 1
ലാംഗ്വേജ് കോഴ്സ്	:	V (അഡീഷണൽ ലാംഗ്വേജ് : II)
ക്രെഡിറ്റ്	:	3

ഗദ്യസാഹിത്യം

പുസ്തകം : ഗദ്യപഥം (കേരളയൂണിവേഴ്സിറ്റി പ്രസിദ്ധീകരണം)

പഠനോദ്ദേശ്യം

മലയാളഗദ്യസാഹിത്യത്തിന്റെ വിവിധമാതൃകകളുമായി വിദ്യാർത്ഥികളെ പരിചയപ്പെടുത്തുകയാണ് ലക്ഷ്യം.

പാഠ്യപദ്ധതി

മൊഡ്യൂൾ : ഒന്ന്

നോവൽ

മലയാള നോവൽ പ്രസ്ഥാനത്തിന്റെ ഉദ്ഭവ-വികാസ-പരിണാമങ്ങളെപ്പറ്റി സാമാന്യമായി മനസ്സിലാക്കുകയും ഒരു നോവൽ വിശദമായി പഠിക്കുകയും വേണം.

വിശദപഠനത്തിന്

ഒരു ദളിത് യുവതിയുടെ കദനകഥ - എം. മുകുന്ദൻ

മൊഡ്യൂൾ : രണ്ട്

ചെറുകഥ

പഠനോദ്ദേശ്യം

മലയാള ചെറുകഥയുടെ വികാസപരിണാമങ്ങളെപ്പറ്റി സാമാന്യജ്ഞാനം നേടുക, ആഖ്യാനതന്ത്രങ്ങളുടെ വൈചിത്ര്യം മനസ്സിലാക്കുക, പ്രമേയത്തിലും രൂപശില്പത്തിലും സംഭവിച്ച മാറ്റങ്ങൾ അറിയുക.

വിശദപഠനത്തിന്

1.	എന്റെ ഗന്ധർവസ്നേഹിതൻ	- ഈ വി. കൃഷ്ണപിള്ള
2.	മനുഷ്യപുത്രി	- ലളിതാംബിക അന്തർജനം
3.	കടനല്ലൂരിലെ ഒരു സ്ത്രീ	- ടി. പത്മനാഭൻ
4.	ഇതാ ഇവിടെവരെയുടെ പരസ്യവണ്ടി പുറപ്പെടുന്നു	- സക്കറിയ
5.	ലോല	- പത്മരാജൻ
6.	അച്യുതമ്മാമ	- കെ. പി. രാമനുണ്ണി
7.	ആറാം കാലം	- അക്ബർ കക്കട്ടിൽ
8.	52 X 32	- സന്തോഷ് ഏച്ചിക്കാനം

മൊഡ്യൂൾ : മൂന്ന്

ഉപന്യാസം, പഠനം, അനുഭവം

സാഹിത്യവും സാഹിത്യേതരവുമായ വിഷയങ്ങളെ സംബന്ധിക്കുന്ന അഞ്ചു രചനകൾ പഠിക്കണം. മലയാള ഗദ്യസാഹിത്യത്തിന്റെ വികാസത്തിൽ ഉപന്യാസങ്ങൾക്കുള്ള പങ്ക് പഠിതാക്കൾക്കു ബോധ്യപ്പെടണം.

വിശദപഠനത്തിന്

1.	മാമ്പഴം	- എം. എൻ. വിജയൻ
2.	ചങ്ങമ്പുഴയുടെ ക്ഷയരോഗം 'കളിത്തോഴി' പ്രവചിച്ചിരിക്കുന്നു	- കെ. പി. അപ്പൻ
3.	കവിതയുടെ മൂലഘടകങ്ങൾ	- സുകുമാർ അഴീക്കോട്
4.	ഗുരുസ്മരണ	- കലാമണ്ഡലം കൃഷ്ണൻനായർ
5.	മഹാനടൻ	- ബാലചന്ദ്രൻ ചുള്ളിക്കാട്

സഹായകഗ്രന്ഥങ്ങൾ

1.	കൈരളിയുടെ കഥ	- പ്രൊഫ. എൻ. കൃഷ്ണപിള്ള
2.	ആധുനിക മലയാളസാഹിത്യ ചരിത്രം പ്രസ്ഥാനങ്ങളിലൂടെ	- ഡോ. കെ. എം. ജോർജ് (ജന: എഡിറ്റർ).
3.	മലയാളനോവൽ സാഹിത്യചരിത്രം	- ഡോ. കെ. എം. തരകൻ.
4.	മലയാള ചെറുകഥാസാഹിത്യചരിത്രം	- ഡോ. എം. എം. ബഷീർ.
5.	ചെറുകഥ ഇന്നലെ ഇന്ന്	- എം. അച്യുതൻ
6.	ചെറുകഥയുടെ ഛന്ദസ്സ്	- വി. രാജകൃഷ്ണൻ
7.	കവിതയും മനഃശാസ്ത്രവും	- എം. എൻ. വിജയൻ.
8.	രോഗവും സാഹിത്യാവേനയും	- കെ. പി. അപ്പൻ.
9.	പത്മരാജൻ : ദുരന്തകാമനകളിലെ ഗന്ധർവൻ	- ഡോ. സജിത് ഏവൂരേത്ത്
10.	ശീർഷാസനം	- എം. എൻ. വിജയൻ

സെമസ്റ്റർ : III
കോഴ്സ് കോഡ് : ML. 1311.1
ലാംഗ്വേജ് കോഴ്സ് : VII (അഡിഷണൽ ലാംഗ്വേജ് : III
ക്രെഡിറ്റ് : 4

ദൃശ്യകലാസാഹിത്യം

(പാഠപുസ്തകം : ദൃശ്യസാഹിതി - കേരളയൂണിവേഴ്സിറ്റി പ്രസിദ്ധീകരണം)

പഠനോദ്ദേശ്യം

നമ്മുടെ ദൃശ്യകലാസംസ്കാരത്തിന്റെ സമ്പന്നതയെക്കുറിച്ചുള്ള സാമാന്യമായ അറിവ് വിദ്യാർത്ഥികൾ നേടേണ്ടതുണ്ട്. കഥകളി, തുള്ളൽ, നാടകം, സിനിമ എന്നീ ദൃശ്യകലകളെയും അവയ്ക്ക് ആധാരമായ സാഹിത്യപാഠങ്ങളെയും വിദ്യാർത്ഥികൾക്ക് പരിചയപ്പെടുത്തുകയാണ് ലക്ഷ്യം.

പാഠ്യപദ്ധതി

മൊഡ്യൂൾ : ഒന്ന്

ആട്ടക്കഥ, തുള്ളൽസാഹിത്യം

കഥകളിയുടെ ഉദ്ഭവവികാസപരിണാമം - പ്രധാന ആട്ടക്കഥാകൃത്തുക്കൾ- തുള്ളൽ പ്രസ്ഥാനം - സാമാന്യപരിചയം.

വിശദപഠനത്തിന്

1. നളചരിതം ആട്ടക്കഥ (രണ്ടാം ദിവസം) -ഉണ്ണായിവാര്യർ (ചൂതിൽ തോറ്റ നളനെ പുഷ്കരൻ കാട്ടിലേക്കു പറഞ്ഞയ്ക്കുന്നതുവരെ) ('ചൊന്നതാചരിപ്പോരിലുന്നതാമ്മേ പ്രീതി' വരെ)
2. കല്യാണസൗഗന്ധികം തുള്ളൽ - കുഞ്ചൻ നമ്പ്യാർ
   'ഉദ്ധതനാകുന്ന ഭീമസേനൻ തന്റെ പദ്ധതി തന്നിൽ
   കണ്ടനേരം തന്നെ നിന്റെ പരമാർത്ഥ-
   മുണ്ടായ് നമുക്കെന്നറിക വ്യകോദരാ' വരെ (106 വരി)

മൊഡ്യൂൾ : രണ്ട്

നാടകസാഹിത്യം

മലയാളനാടകപ്രസ്ഥാനം - സാമാന്യാവലോകനം

വിശദപഠനത്തിന്

1. കേരളശാകുന്തളം (നാലാം അങ്കം) - വിവ. ആറ്റൂർ കൃഷ്ണപ്പിഷാരടി
   (മറ്റ് അങ്കങ്ങൾ സാമാന്യമായി പരിചയപ്പെടുകയും നാലാം അങ്കം വിശദമായി പഠിക്കുകയും വേണം).
2. ഗുഡ്നൈറ്റ് (ഏകാങ്കനാടകം) - എൻ. എൻ. പിള്ള
3. കറുത്ത ദൈവത്തെത്തേടി - ജി. ശങ്കരപ്പിള്ള

മൊഡ്യൂൾ : മൂന്ന്

തിരക്കഥാപഠനം

ചലച്ചിത്രനിർമ്മിതിയിൽ തിരക്കഥയ്ക്കുള്ള പ്രാധാന്യത്തെക്കുറിച്ച് സാമാന്യജ്ഞാനം നേടണം.

വിശദപഠനത്തിന്

വൈശാലി - എം. ടി വാസുദേവൻ നായർ

സഹായഗ്രന്ഥങ്ങൾ

1.	കൈരളിയുടെ കഥ	-	പ്രൊഫ. എൻ. കൃഷ്ണപിള്ള
2.	ആധുനിക സാഹിത്യചരിത്രം പ്രസ്ഥാനങ്ങളിലൂടെ	-	കെ. എം. ജോർജ്ജ് (എഡി:)
3.	നളചരിതം ആട്ടക്കഥ-കൈരളിവ്യാഖ്യാനം	-	പ്രൊഫ. പന്മന രാമചന്ദ്രൻനായർ
4.	ഉയരുന്ന യവനിക	-	സി. ജെ. തോമസ്.
5.	മലയാള നാടകസാഹിത്യചരിത്രം	-	ജി. ശങ്കരപ്പിള്ള
6.	മലയാളനാടകസാഹിത്യചരിത്രം	-	ഡോ: വയലാ വാസുദേവൻപിള്ള
7.	സിനിമയുടെ വ്യാകരണം	-	ഡോ. ജിതേഷ്
8.	തിരക്കഥാരചന : കലയും സിദ്ധാന്തവും	-	ജോസ് കെ. മാനുവൽ
9.	കഥയും തിരക്കഥയും	-	ആർ.വി. എം. ദിവാകരൻ
10.	തോപ്പിൽ ഭാസിയുടെ നാടകങ്ങൾ : ഒരു പഠനം	-	ഡോ. എ. ഷീലാകുമാരി.

സെമസ്റ്റർ	:	IV
കോഴ്സ് കോഡ്	:	ML. 1411.1
ലാംഗ്വേജ് കോഴ്സ്	:	IX (അഡീഷണൽ ലാംഗ്വേജ് IV)
ക്രെഡിറ്റ്	:	4

വിനിമയം, സർഗ്ഗാത്മകരചന, ഭാഷാവബോധം

പഠനോദ്ദേശ്യം

(i) ആശയവിനിമയത്തിന്റെ വിവിധ ഘടകങ്ങളും പ്രക്രിയകളും വിദ്യാർത്ഥികൾക്ക് പരിചയപ്പെടുത്തുക. ആശയവിനിമയ സിദ്ധാന്തങ്ങളെക്കുറിച്ചും ആശയവിനിമയ മാതൃകകളെക്കുറിച്ചും അവബോധമുണ്ടാക്കുക (ii) ഭരണകാര്യങ്ങൾമാതൃഭാഷയിലൂടെ നിർവഹിക്കപ്പെടണം എന്ന കാര്യം ഇന്ന് പൊതുവെ അംഗീകരിക്കപ്പെട്ടിട്ടുണ്ട്. മലയാളം ഭരണഭാഷയാകുമ്പോൾ ഉണ്ടാകാവുന്ന പ്രശ്നങ്ങളെക്കുറിച്ച് വിദ്യാർത്ഥികളെ ബോധവൽകരിക്കുക. ഭരണഭാഷാ മലയാളത്തിന്റെ വ്യാപനത്തിന് അവരെ സജ്ജരാക്കുക. (iii) എഴുത്തുകാരുടെ രചനാനുഭവങ്ങൾ വിദ്യാർത്ഥികൾക്ക് പരിചയപ്പെടുത്തുക. സർഗ്ഗാത്മകരചനയ്ക്ക് വിദ്യാർത്ഥികളെ പ്രാപ്തരാക്കുക. (iv) പദം, വാക്യം, ചിഹ്നം എന്നിവ തെറ്റുകൂടാതെ പ്രയോഗിക്കുന്നതിലൂടെ ഭാഷാശുദ്ധി നിലനിർത്തുക. വിവർത്തനത്തിൽ പ്രയോഗിക പരിശീലനം നൽകുക.

പാഠ്യപദ്ധതി

മൊഡ്യൂൾ : ഒന്ന്
വിനിമയവും മാധ്യമങ്ങളും

വിനിമയം-നിർവചനം-ആശയവിനിമയ പ്രക്രിയ - വ്യവസ്ഥാപനം (Encoding), നിർവ്യവസ്ഥാപനം (Decoding) ആശയവിനിമയ പ്രക്രിയയുടെ ഘടകങ്ങൾ, ആശയവിനിമയ മാതൃകകൾ- വിവിധതരം ആശയവിനിമയങ്ങൾ - ആത്മഗത, വ്യക്ത്യന്തര, സംഘാത്മക, ബഹുജന ആശയവിനിമയങ്ങൾ - വിവിധതരം മാധ്യമങ്ങൾ അച്ചടി, റേഡിയോ, ടെലിവിഷൻ, സിനിമ, ഇന്റർനെറ്റ് തുടങ്ങിയ നവമാധ്യമങ്ങൾ - ഇവയുടെ സവിശേഷതകൾ - മാധ്യമങ്ങളും സമൂഹവും.

വിശദപഠനത്തിന്

മാധ്യമം : മൗലികതയും നിരാകരണവും' - ഡോ. എ. എം. ശ്രീധരൻ, നാഷണൽ ബുക്ക് സ്റ്റാൾ. (താഴെപ്പറയുന്ന രണ്ടു ലേഖനങ്ങൾ മാത്രം).

1. മാനവ ആശയവിനിമയം- തത്ത്വവും പ്രയോഗവും.
2. ആശയവിനിമയം : സിദ്ധാന്തവും പ്രയോഗവും.

മൊഡ്യൂൾ : രണ്ട്
ഭരണഭാഷ മലയാളം

ഭരണഭാഷ - നിർവചനം - ഭരണനിർവഹണം മാതൃഭാഷയിലൂടെ ആകേണ്ടതിന്റെ ആവശ്യകത - മലയാളം ഭരണഭാഷയാക്കുമ്പോൾ സ്വീകരിക്കേണ്ട മുന്നൊരുക്കങ്ങൾ ഭരണഭാഷയ്ക്കുണ്ടായിരിക്കേണ്ട ഗുണങ്ങൾ - നിയതാർത്ഥബോധകം, ആർജ്ജവം, സുതാര്യത സരളം, ലഘുവാക്യങ്ങൾ, ആശയത്തെക്കുറിച്ചുള്ള അസന്നിഗ്ദ്ധത മുതലായവ - വിവിധ സർക്കാർ വകുപ്പുകളുടെ സാങ്കേതിക പദാവലികൾ.

പഠനപ്രവർത്തനം

ഇംഗ്ലീഷിലുള്ള സർക്കാർ ഉത്തരവുകളും നടപടിക്രമങ്ങളും മലയാളത്തിലേക്കു മാറ്റാനുള്ള പരിശീലനം.

മൊഡ്യൂൾ : മൂന്ന്
സർഗ്ഗാത്മകരചന

സർഗാത്മകത - നിർവചനം - സർഗാത്മകതയുടെ ഉറവിടം - വിവിധ കാഴ്ചപ്പാടുകൾ - കാവ്യപ്രചോദനത്തെക്കുറിച്ചുള്ള ഭാരതീയ സങ്കല്പം - പ്രതിഭയെക്കുറിച്ചുള്ള രാജശേഖരന്റെ അഭിപ്രായം - ഭാവയിത്രി, കാരയിത്രി - ഭാവനയെപ്പറ്റി കോളറിഡേജ് - പ്രഥമഭാവനയും ദ്വിതീയ ഭാവനയും - ഫാന്റസിയും ഇമാജിനേഷനും തമ്മിലുള്ള വ്യത്യാസം - വേർഡ്സ്വർത്തിന്റെ

കാവ്യനിർവ്വനം - സർഗ്ഗാത്മകരചനയിലേക്കു നയിക്കുന്ന സാഹചര്യങ്ങൾ- ജന്മവാസനയും അനുഭവവും - രചനയുടെ വിവിധ ഘട്ടങ്ങൾ.

കവിത, കഥ, ലഘുനാടകം, ഹ്രസ്വചിത്രങ്ങൾക്കുള്ള തിരക്കഥ, ഫീച്ചർ തുടങ്ങിയവയുടെ രചനാപരിശീലനം വിദ്യാർത്ഥികൾക്ക് നൽകേണ്ടതാണ്.

ആവശ്യമെങ്കിൽ വിദ്യാർത്ഥികളെ ഗ്രൂപ്പുകളായി തിരിക്കാവുന്നതാണ്.

വിശദപഠനത്തിന്

1. സർഗ്ഗാത്മകത - ഡോ. കെ. എം. കോശി (സാഹിത്യവിജ്ഞാനപ്രവേശിക).
2. വാക്കുകളുടെ ശില്പം - എം. കെ. സാനു (കാവ്യതത്ത്വപ്രവേശിക).
3. എന്റെ കവിതയെപ്പറ്റി ('ഇരുൾച്ചിറകുക'ളുടെ ആമുഖം) - സുഗതകുമാരി
4. കാഥികന്റെ പണിപ്പുര - എം. ടി. വാസുദേവൻ നായർ. ഒരു കഥ ജനിക്കുന്നു എന്ന അനുഭവക്കുറുപ്പ് മാത്രം)

മൊഡ്യൂൾ : നാല്

ഭാഷാവബോധം

തെറ്റായ രൂപത്തിൽ എഴുതപ്പെടുന്ന വാക്കുകളും അവയുടെ ശരിയായ രൂപങ്ങളും - വാക്യ രചനയിൽ സാധാരണ വരുന്ന പിഴവുകളും അവ തിരുത്തുന്നതിനുള്ള മാർഗ്ഗനിർദ്ദേശങ്ങളും - പ്രധാനപ്പെട്ട ചിഹ്നങ്ങളും അവയുടെ പ്രയോഗസാഹചര്യങ്ങളും.

പ്രായോഗിക പരിശീലനം

ഇംഗ്ലീഷിൽനിന്ന് മലയാളത്തിലേക്കും മലയാളത്തിൽനിന്ന് ഇംഗ്ലീഷിലേക്കുമുള്ള വിവർത്തനം- ഗദ്യം - പദ്യം, ശൈലികൾ, പഴഞ്ചൊല്ലുകൾ, സാങ്കേതിക പദങ്ങൾ മുതലായവയുടെ വിവർത്തനം.

സഹായകഗ്രന്ഥങ്ങൾ, വെബ്സൈറ്റുകൾ

1. മാധ്യമം : മൗലികതയും നിരാകരണവും - ഡോ. എ. എം. ശ്രീധരൻ, നാഷണൽബുക്ക് സ്റ്റാൾ.
2. മാധ്യമങ്ങളും മലയാളസാഹിത്യവും - എം. വി. തോമസ്, കേരള സാംസ്ക്കാരിക പ്രസിദ്ധീകരണവകുപ്പ്.
3. മാധ്യമങ്ങളും മലയാളസാഹിത്യവും - പലർ, കേരള ഭാഷാ ഇൻസ്റ്റിറ്റ്യൂട്ട്.
4. മാധ്യമവിചിന്തനം - ഡോ. കെ. വി. തോമസ്, ഡോ. മാത്യു ജെ. മുട്ടത്ത്, ലിപി പബ്ലിക്കേഷൻസ്, കോഴിക്കോട്.
5. മലയാളവും ഇന്റർനെറ്റും - സുനിത ടി. വി., ലിപി പബ്ലിക്കേഷൻസ്, കോഴിക്കോട്.
6. സൈബർ മലയാളം - (എഡി.) സുനിത ടി. വി., കറന്റ് ബിക്സ്, തൃശൂർ

7.	ഭാഷയും ഭരണഭാഷയും	- ഡോ. എഴുമറ്റൂർ രാജരാജവർമ്മ, ഇൻഫർമേഷൻ ആന്റ് പബ്ലിക്കേഷൻ വകുപ്പ്, കേരള സർക്കാർ.
8.	ഭരണ ശബ്ദാവലി	- കേരളഭാഷാഇൻസ്റ്റിറ്റ്യൂട്ട്.
9.	വൃത്താന്തപത്രപ്രവർത്തനം	- സ്വദേശാഭിമാനി രാമകൃഷ്ണപിള്ള മാളുബൈൻ പബ്ലിക്കേഷൻസ്.
10.	ലിറിക്കൽ ബാലഡ്സിന്റെ ആമുഖം	- വില്യം വേർഡ്സ്വർത്ത്, വിവ: ഡോ. തോന്നയ്ക്കൽ വാസുദേവൻ, എം. എൻ. വിജയൻ സാംസ്കാരിക വേദി.
11.	സാഹിത്യവിദ്യ	- കുട്ടികൃഷ്ണമാരാർ, മാരാർ സാഹിത്യപ്രകാശം, കോഴിക്കോട്.
12.	കാഥികന്റെ പണിപ്പുര	- എം. ടി. വാസുദേവൻ നായർ, ഡി. സി. ബുക്സ്.
13.	ഉയരുന്ന യവനിക	- സി. ജെ. തോമസ്, മാളുബൻ പബ്ലിക്കേഷൻസ്, തിരുവനന്തപുരം.
14.	കാവ്യസ്വരൂപം	- എസ്. ഗുപ്തൻനായർ, ലിപി പബ്ലിക്കേഷൻസ്, കോഴിക്കോട്.
15.	കഥയുടെ ന്യൂക്ലിയസ്സ്	- ഡോ. വത്സലൻ വാതുശ്ശേരി, ഒലിവ് പബ്ലിക്കേഷൻസ്, കോഴിക്കോട്.
16.	ഇരുൾച്ചിറകുകൾ	- സുഗതകുമാരി.
17.	ഗദ്യശില്പം	- സി. വി. വാസുദേവഭട്ടതിരി, കേരളഭാഷാ ഇൻസ്റ്റിറ്റ്യൂട്ട്.
18.	തെറ്റും ശരിയും	- പ്രൊഫ. പന്മന രാമചന്ദ്രൻ നായർ, കറന്റ് ബുക്സ്, കോട്ടയം.
19.	തെറ്റില്ലാത്ത മലയാളം	- പ്രൊഫ. പന്മന രാമചന്ദ്രൻ നായർ, കറന്റ് ബുക്സ്, കോട്ടയം
20.	ഭാഷാശുദ്ധി-സംശയപരിഹാരങ്ങൾ	- പ്രൊഫ. പന്മന രാമചന്ദ്രൻ നായർ, കറന്റ് ബുക്സ്, കോട്ടയം
21.	ഭാഷാശുദ്ധിയും ഭരണഭാഷയും	- ഡോ. വിളക്കുടി, രാജേന്ദ്രൻ, പ്രിയദർശിനി പബ്ലിക്കേഷൻസ്.
22.	മലയാളശൈലി	- കുട്ടികൃഷ്ണമാരാർ, മാരാർ സാഹിത്യപ്രകാശം, കോഴിക്കോട്.
23.	തായ്മൊഴി	- എം. എൻ. കാരശ്ശേരി, ഡി. സി. ബുക്സ്.

24. ഭരണഭാഷാപ്രശ്നങ്ങൾ - എം. വി. തോമസ്, കേരള ഭാഷാ ഇൻസ്റ്റിറ്റ്യൂട്ട്.
25. വിവർത്തനവിചാരം - ഡോ. എൻ. ഇ. വിശ്വനാഥഅയ്യർ, കേരള ഭാഷാ ഇൻസ്റ്റിറ്റ്യൂട്ട്.
26. തർജമയുടെ താക്കോൽ - സി. വി. വാസുദേവ ഭട്ടതിരി, സ്കൈ ബുക്സ് പബ്ലിഷേഴ്സ്.
27. നല്ല മലയാളം - സി. വി. വാസുദേവഭട്ടതിരി, ലിപി പബ്ലിക്കേഷൻസ്, കോഴിക്കോട്.
28. http://en.wikipedia.org/wiki/media_influence.
29. http://en.wikipedia.org/wiki/creative_writing.
30. http://www.du.ac.in/du/coursel creative writing.pdf.

Semester I
Common for B.A/BSc [EN 1111.1] & B.Com [EN 1111.2]
Language Course 1: Listening, Speaking and Reading

No. of Credits: 4 General Objectives

The general objective of the course is to make the students proficient communicators in English. It aims to develop in the learners the ability to understand English in a wide range of contexts. The main thrust is on understanding the nuances of listening, speaking and reading English. The course is a step towards preparing the learners to face situations with confidence and to seek employment in the modern globalized world. As knowledge of English phonetics will help the students to listen and to speak English better, they would be given rudimentary training in English phonetics. It also enhances the student‟s general standard of spoken English. The knowledge of the phonetic alphabets/symbols will help the students to refer the dictionary for correct pronunciation.

Module I Listening

Introduction, definition of listening, listening Vs hearing, process of listening, problems students face in listening, sub-skills of listening, what is good listening? strategies of listening, barriers to listening, listening in the workplace, activities that help you to become better listeners.

Module II Speaking

English, the lingua franca, varieties of English; Indian English, Received Pronunciation, Why phonetics?

Organs of speech and speech mechanism; Classification of English sounds- vowels; consonants; IPA symbols, transcription, the syllable, syllable structure, stress and intonation, some rules of pronunciation, Indian English and deviations from RP, Speaking as a skill; speaking on formal and informal occasions; how to perform a wide range of language functions such as greeting, thanking, complaining, apologizing.

Module III Reading

Introduction, The Reading Process, Reading and Meaning, Methods to Improve Reading, Strengthening Your Vocabulary, Understanding Graphics and Visual Aids, Previewing, Reading in Thought Groups, Avoiding the re-reading of the Same Phrases, Barriers to

Reading, Skills for Speed Reading, Sub-skills of Reading, Skimming, Scanning, Extensive Reading, Intensive Reading, Reading E-mail, E-books, Blogs and Web pages
(Students should be given ample practice in dialogue, using core and supplementary materials.)

COURSE MATERIAL

Modules 1-3
Core Reading: ***English Language Skills for Communication I*** Published by Oxford University Press
Module 4
Core Reading: ***Four One-Act Plays*** Published by Mainspring Publishers, Chennai
The following one act plays are prescribed
1. *The Pie and the Tart* :Hugh Chesterman
2. *Under Fire* : Laurence Housman
3. *The Brink of Silence* : Esther E. Galbraith
4. *The Dear Departed* : Stanley Houghton

Further reading:
1. Marks, Jonathan. *English Pronunciation in Use*. New Delhi: CUP, 2007.
2. Lynch, Tony. *Study Listening.* New Delhi: CUP, 2008.
3. Kenneth, Anderson, Tony Lynch, Joan Mac Lean. *Study Speaking*. New Delhi: CUP, 2008.
Reference:
Jones, Daniel. *English Pronouncing Dictionary* 17th Edition. New Delhi: CUP, 2009.

SEMESTER I
Foundation Course 1 for BA/B Sc

WRITINGS ON CONTEMPORARY ISSUES: EN 1121

No. of credits: 2
AIMS
1. To sensitize students to the major issues in the society and the world.
2. To encourage them to read literary pieces critically.

OBJECTIVES
On completion of the course, the students should be able to
1. have an overall understanding of some of the major issues in the contemporary world.
2. respond empathetically to the issues of the society.
3. read literary texts critically.

COURSE OUTLINE

Module I: Human Rights

(1) “Grim Realities, Hopeful Hues” – V.R.Krishna Iyer.

(2) “Poverty is the Greatest Threat” – N.R.Madhava Menon.

(3) “The Little Black Boy” – William Blake

Module II: The Gender Question

(4) “Violence against Women” – Gail Omvedt

(5) “The Goddess of Revenge” – Lalithambika Antharjanam

(6) “Nani” – Kamala Das

Module III: Globalisation

(7) "Lessons for Sustainable and Beneficial Coexistence" – Christabell P.J

(8) "Going Local" – Helena Norberg-Hodge

(9) "Freedom" – Balachandran Chullikkad

Module IV: Alcohol and Drug Abuse

(10) "The Bane of Alcoholism" – Adithi .N
(11) "Substance Use Disorders in Children and Adolescents"- Ajeesh P.R
(12) "The Alcoholic at Dawn" – Jeet Thayil

COURSE MATERIAL

Modules 1 - 4
Core reading: *Perspectives on Contemporary Issues*. ed. Vinita Sinha. Emerald Publishers 2016.

SEMESTER II

Language Course (B.A/B Sc English III): ENVIRONMENTAL STUDIES: EN 1211.1
No. of Credits: 4
Module 1
Environmental studies: Definition, Need, Scope and Importance, Need for public awareness. Natural resources- Forest resources, water resources, mineral resources, food resources, energy resources, land resources- over exploitation, case studies.
Module 2
Eco-system- structure and function, producers, consumers and decomposers energy flow in the ecosystem, ecological succession, forest ecosystem, grassland ecosystem, desert ecosystem and aquatic ecosystem. Biodiversity and its value and conservation, hot spots of biodiversity, India as a mega-diversity nation, endangered and endemic species of India, conversation of bio-diversity. In-situ and Ex-situ conversation of bio-diversity. Sustainable use of forest – water- land -resources –Human population and its impact on environment.
Module 3
Pollution: air, water, soil and marine, noise, thermal and nuclear hazards. Solid waste management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies. Disaster management. Social issues and the Environment: from unsustainable to sustainable development, water conversation-rain water harvesting; global warming; consumerism and waste products: various acts to protect the environment; Environment protection Act; Air (Prevention and Control of Pollution) Act; Water (Prevention and Control of pollution) Act; Wild Life Protection Act; Forest Conversation Act:
Module 4
Human population and Environment: Population explosion, Family Welfare Programmes, Environment and human health; human rights, HIV/AIDS, Women and Child Welfare, Role of Information Technology in Environment and Human health.
Field work and Project- Visit to ecologically polluted spots: Study of nature: study of forest, insects, animals, birds and plants. Project Report on the basis of field work about 15 pages.
Total Marks: 100
Written Exam: 85 Marks;
Internal Assessment: 15 Marks (Attendance- 5 marks + 10 test paper);
Core Text: *Greening the Earth* Published by Scientific International, New Delhi.
Books for Reference:

Adams, W.M. Future Nature: A Vision for Conservation. London: Earthscan, 2003.
Arnold, David and Ramachandra Guha, ed. Nature, Culture and Imperialism:Essays on the Environmental History of South Asia. New Delhi: Oxford UPM 2001.
Bahuguna, Sunderlal. "Environment and Education". The Cultural Dimension of Ecology. Ed. Kapila Vatsyayan. New Delhi: D.K. Printworld. 1998.
Crson, Rachel. Silent Spring. Boston: Houghton Mifflin, 1962.
Guha, Ramachandra- Environmentalism: A Global History, New Delhi: Oxford UP, 2000.
Hayward, Tim. Ecological Thought: An Introduction: Cambridge; polity, 1994.
Merchant, Crolyn. The Death of Nature. New York: Harper, 1990.
Gleick H.P. 1993. Water in Crisis, Pacific Institute for Studies in development Environment and security. Stockholm Env Institute. OUP 473 p.
Heywood V and Watson R.E. 1995. Global biodiversity Assessment. CUP 1140p
Odum FP. 1971. Fundamentals of Ecology. W.B Saunders Co. USA 574p
Rao. M. N and Dutta A.K. 1987. Waste Water Treatmentt. Oxford and IBH Publ Co Pvt.
Wagner K.D. 1998. Environmental Management. WB Saunders Co. Philadelphia, USA. 499p.

SEMESTER II
Language Course 4: MODERN ENGLISH GRAMMAR AND USAGE
(BA/B Sc English IV) EN 1212.1. (BCom) EN1211.2

BA/B Sc No. of credits: 3
AIMS: 1. To help students have a good understanding of modern English grammar.
2. To enable them produce grammatically and idiomatically correct language.
3. To help them improve their verbal communication skills.
4. To help them minimise mother tongue influence.
OBJECTIVES: On completion of the course, the students should be able to
1. have an appreciable understanding of English grammar.
2. produce grammatically and idiomatically correct spoken and written discourse.
3. spot language errors and correct them.

COURSE CONTENTS

Module 1:

- Modern English grammar - what and why and how of grammar - grammar of spoken and written language

- Sentence as a self-contained unit – various types of sentence – simple – compound – complex – declaratives – interrogatives – imperatives – exclamatives.

- Basic sentence patterns in English - constituents of sentences – subject – verb - object - complement - adverbials.

- Clauses - main and subordinate clauses - noun clauses - relative clauses - adverbial clauses - finite and non-finite clauses - analysis and conversion of sentences – Active to Passive and vice versa – Direct to Indirect and vice versa – Degrees of Comparison, one form to the other.

- Phrases - various types of phrases - noun, verb, adjectival and prepositional phrases.

- Words - parts of speech – nouns – pronouns - adjectives verbs - adverbs – prepositions – conjunctions -determinatives.

Module 2:

- Nouns - different types - count and uncount – collective - mass - case - number – gender.
- Pronoun - different types - personal, reflexive - infinite-emphatic – reciprocal.
- Adjectives - predicative - attributive - pre- and post-modification of nouns.
- Verbs - tense-aspect - voice -mood - Concord - types of verbs – transitive - intransitive- finite - non-finite.
- Helping verbs and modal auxiliaries - function and use.

Module 3:

- Adverbs - different types - various functions - modifying and connective.
- Prepositions - different types - syntactic occurrences - prepositional phrases - adverbial function.
- Conjunctions - subordinating and coordinating Determinatives articles - possessives - quantifiers

Module 4:

- Remedial grammar - error spotting - errors in terms of specific grammatical concepts like constituents of sentences - parts of speech - concord – collocation - sequences of tense - errors due to mother tongue influence.
- Written Composition – precis writing – outline story – expansion of proverb – short essay.

COURSE MATERIAL

Modules 1 - 4

Core Reading:*Concise English Grammar* by Prof. V. K. Moothathu. OxfordUniversity Press, 2012.

Further Reading:

1. Leech, Geoffrey et al. *English Grammar for Today: A New Introduction.* 2nd Edition.Palgrave, 2008.
2. Carter, Ronald and Michael McCarthy. *Cambridge Grammar of English.* CUP, 2006.
3. Greenbaum, Sidney. *Oxford English Grammar.* Indian Edition. OxfordUniversity Press, 2005.
4. Sinclair, John ed. *Collins Cobuild English Grammar*. Harper Collins publishers, 2000.
5. Driscoll, Liz. *Common Mistakes at Intermediate and How to Avoid Them*.CUP, 2008.
6. Tayfoor, Susanne. *Common Mistakes at Upper-intermediate and How to Avoid Them*. CUP, 2008.
7. Powell, Debra. *Common Mistakes at Advanced and How to Avoid Them.*CUP, 2008.
8. Burt, Angela. *Quick Solutions to Common Errors in English*. Macmillan India Limited,2008.
9. Turton. *ABC of Common Grammatical Errors*. Macmillan India Limited, 2008.

10. Leech, Geoffrey, Jan Svartvik. *A Communicative Grammar of English.* ThirdEdition. New Delhi: Pearson Education, 2009.

Direction to Teachers: The items in the modules should be taught at application level with only necessary details of concepts. The emphasis should be on how grammar works rather than on what it is. The aim is the correct usage based on Standard English and not conceptual excellence.

SEMESTER III
Language Course 6: WRITING AND PRESENTATION SKILLS
(BA/ BSc English V) EN 1311.1

No. of credits: 4

AIMS

1. To familiarize students with different modes of general and academic writing.
2. To help them master writing techniques to meet academic and professional needs.
3. To introduce them to the basics of academic presentation
4. To sharpen their accuracy in writing.

OBJECTIVES

On completion of the course, the students should be able to

1. understand the mechanism of general and academic writing.
2. recognize the different modes of writing.
3. improve their reference skills, take notes, refer and document data and materials.
4. prepare and present seminar papers and project reports effectively.

COURSE OUTLINE

Module 1

Writing as a skill – its importance - mechanism of writing – words and sentences - paragraph as a unit of structuring a whole text - combining different sources – functional use of writing – personal, academic and business writing – creative use of writing.

Module 2

Writing process - planning a text - finding materials – drafting – revising – editing -finalizing the draft - computer as an aid - key board skills.

Module 3

Writing models – essay - précis - expansion of ideas –- letter writing - personal letters - formal letters - CV – surveys – questionnaire - e-mail – fax - job application - report writing.

Module 4

Presentation as a skill - elements of presentation strategies – audience – objectives – medium - key ideas - structuring the material - organizing content - audio-visual aids - hand-outs - seminar paper presentation and discussion.

COURSE MATERIAL

Modules 1 – 4

Core reading: *Writing today*: Orient Blackswan

Further reading

1. Robert, Barraas. *Students Must Write*. London: Routledge, 2006.
2. Bailey, Stephen. *Academic Writing.* Routledge, 2006.
3. Hamp-Lyons, Liz, Ben Heasley. *Study Writing.* 2nd Edition. Cambridge University Press, 2008.
4. Ilona, Leki. *Academic Writing*. CUP, 1998.

5. McCarter, Sam, Norman Whitby. *Writing Skills.* Macmillan India, 2009.
6. Jay. *Effective Presentation*. New Delhi: Pearson, 2009.

Reference:

Mayor, Michael, et al, Ed. Longman Dictionary of Contemporary English. 5th Edition. London: Pearson Longman Ltd, 2009.

SEMESTER: IV
Language Course 8: READINGS IN LITERATURE
(BA/B.Sc English VI) EN1411.1

No. of credits: 4

AIMS

1. To sensitize students to the aesthetic, cultural and social aspects of literature.
2. To help them analyze and appreciate literary texts.

OBJECTIVES

On completion of the course, the students should be able to:
1. understand and appreciate literary discourse.
2. look at the best pieces of literary writing critically.
3. analyze literature as a cultural and interactive phenomenon.

Module 1

What is literature – literature and context – genres – literature and human values – creative use of language – inculcation of aesthetic sense.
Poetry – what is poetry – different types of poetry – poetic diction – figurative language – themes – stanza – rhyme.

Module 2

Drama.
Scope and definition – different types – one act plays - structure – dialogue – characters – action.

Module 3

Prose
What is prose – different types – personal – impersonal – technical.

Module 4:

Fiction.
What is fiction – different types – plot – characters – setting – point of view – short story – its characteristics.

COURSE MATERIAL

Module 1

Poetry

1. William Shakespeare	All the World is a Stage
2. William Wordsworth	Leech Gatherer or Resolution and Independence
3. John Keats	La Belle Dame Sans Merci
4. Matthew Arnold	Dover Beach
5. Alfred Tennyson	Ulysses
6. W B Yeats	A Prayer for My Daughter
7. Wilfred Owen	Insensibility
8. Seamus Heaney	A Constable Calls
9. Sarojini Naidu	A Challenge to Fate
10. Kamala Das	An Introduction
11. Robert Frost	Mending Wall
12. Sachithananthan	Stammer

Module 2

Essays

1. E M Forster	Tolerance
2. J B Priestley	On Doing Nothing
3. Albert Einstein	Religion and Science
4. Jawaharlal Nehru	Independence and After
5. Nelson Mandela	An Ideal for which I am Prepared to Die

Module 3

Core reading: *A Bouquet of Stories*, Edited by Kishore Ram

Stories prescribed:

1. R K Narayan	Doctor‟s Word
2. K R Meera	Yellow is the Colour of Longing
3. Saki	Open Window
4. Somerset Maugham	The Bet
5. M T Vasudevan Nair	Sherlock

Further reading

1. A Concise Companion to Literary Forms. Emerald, 2013.
2. Abrams, M. H. A Glossary of Literary Terms.
3. Klarer, Mario. An Introduction to Literary Studies. Second edition. Routledge, 2009

Direction to Teachers

The introduction to various genres is intended for providing basic information and no conceptual analysis is intended.

Syllabus

Common Course- Hindi (For B A/ B.Sc.)

Semester-1

HN 1111.1 Language Course-Common (Addl. Language I) - Prose and Grammar

Aim of the Course/Objectives

The aim of the course is to sensitize the student to the aesthetic and cultural aspect of literary appreciation and analysis. To introduce modern Hindi prose to the students and to understand the cultural, social and moral values of modern Hindi Prose. To understand the theory and Practice of Hindi Grammar.

Module 1

Prose

Module 2

Grammar

Parts of speech – Varna – Noun – Ling, Vachan , Karak – Pronoun – Adjective – Verb –Tense, Voice

Grammar Practice – Sentence Correction- Change of Tense – „Ne‟ rule

Semester 2

HN 1211.1 Language Course -Common (Addl. Language II) - Fiction, Creative Writing and Communication Skills

Aim of the Course/Objectives

The aim of the course is to guide the students to the world of Hindi fiction (Novel & Short Story). To develop the capacity of creative process and communication skills.

Module 1

Short Story

Module 2

Novel

Module 3

Creative Writing

Power of Hindi Language introduction – General principles of writing literary and non-literary –plotting and characterization – observation – investigation, innovation, stylization, Techniques of genre- Appreciation and Critical analysis of poetry, short story, film etc.

Review all other stories except the stories prescribed for study (from Kahani Gulshan). Review recent films(Malayalam, Tamil and Hindi only). An article on your favorite actor or writer.

Module 4

Hindi for academic communication Literary communication, Journalism, Columns, Multimedia as a mode of communication – Important Newspapers and Journals in Hindi – Hindi Journals published from Kerala (Sangrathan, Keral Jyothi etc.)

From the text Kathanjali, edited by A. Meera Sahib. Omit the lesson Dukh by Yashpal.

Semester 3

HN 1311.1 Language Course -Common (Addl. Language III) - Fiction, Creative Writing and Communication Skills

Aim of the Course/Objectives

The aim of the course is to appreciate the literary and stylistic elements of Hindi Drama and One Act Plays. To understand the distinct features of Hindi Drama. To expand translation.

Module 1

Drama

Module 2

One Act Play

Module 3

Translation -Translation definition – importance of translation-field of translation

Types of Translation –Literacy, Non literary and Media Translation- Translation and Technology and Computer- Translation of English passage to Hindi.

Semester 4

HN 1411.1 Language Course -Common (Addl. Language IV) – Poetry, Long Poems and Culture

Aim of the Course/Objectives

The aim of the course is to introduce the student to the world of Hindi poetry Ancient and Modern. To sensitize the student to the aesthetic aspects of literary appreciation and analysis. To introduce the specialties of Indian Culture and Kerala Culture.

Module 1

Poetry - Ancient and Modern

Module 2

Long poems

Module 3

Culture- general introduction

A. Indian Culture - Ancient period, Mughal period and culture - English power and its cultural impact - Socio religion reform movements - freedom movement – Gandhiji and Non Violence - Nehru and unity in diversity - post independence and post modern culture - specialities of Indian culture.
B. Kerala culture - An introduction to Kerala - Kerala Culture ancient period - protest against caste and colour - Sree Narayana Guru – Chattambiswamikal - Ayyankali - Gandhiyan movement - Festivals like Onam - Folk Arts – Kathakali - post independence and post modern culture - specialities of Kerala culture.