गुरु घासीदास विश्वविद्यालय
(केन्द्रीय विश्वविद्यालय अधिनियम 2009 क्र. 25 के अंतर्गत स्थापित केन्द्रीय विश्वविद्यालय)
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List of New Courses Introduced

Department :	**Mathematics**
Program Name :	**B.Sc., MSc.**
Academic Year : 2016-17	

List of New Courses Introduced

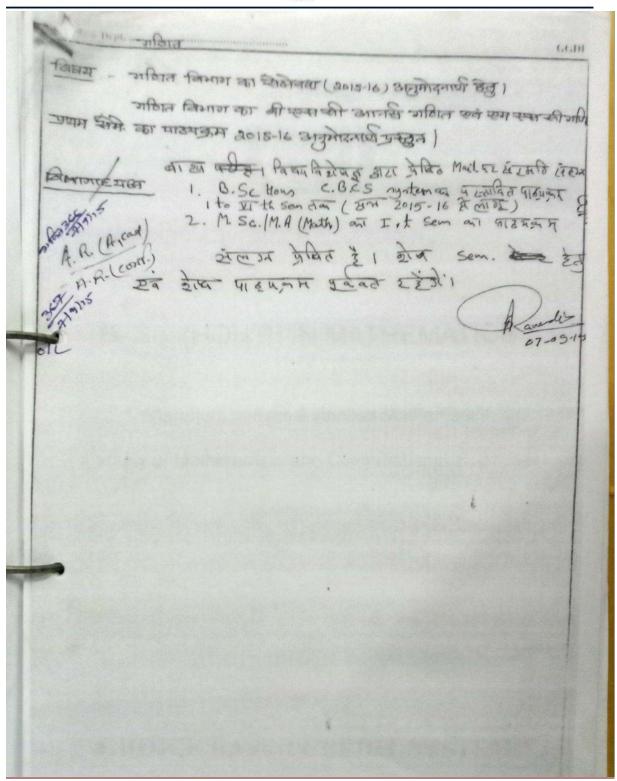| Sr. No.	Course Code	Name of the Course
01.	MSC 3.1	Vector Calculus, Fourier Series and Laplace Transform
02.	MSC 3.2	Ordinary Differential Equations
03.	MSC 4.1	Modern Algebra
04.	MSC 4.2	Partial Differential Equations

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Dept.— गणित   G.G.DU

विषय – गणित विभाग का सिलेबस (2015-16) अनुमोदनार्थ हेतु।

गणित विभाग का बी.एस.सी.ऑनर्स आनर्स गणित एवं स्नातकोत्तर गणि
उपाधि डिग्री का पाठ्यक्रम 2015-16 अनुमोदनार्थ प्रस्तुत।

विभागाध्यक्ष   का एक क्लैक्चर, विषय विशेषज्ञ द्वारा प्रेषित Mail पर धारणीति विवरण
                      1. B.Sc Hons C.BCS system का प्रस्तावित पाठ्यक्रम
                         1 to VI th sem तक (सत्र 2015-16 मैं लागू)
                      2. M.Sc./M.A (Math) का I, II sem का पाठ्यक्रम

                      संलग्न प्रेषित है। शेष sem. हेतु
                      एवं शेष पाठ्यक्रम प्रस्तुत रहेंगे।

                                                              R.
                                                              07-09-15

विद्यापरिषद की बैठक दिनांक 28/11/2015 के कार्यहस्त का अंश

विषय क्र.-18.   शैक्षणिक सत्र 2015-16 हेतु प्रचलित पाठ्य विवरणों के अनुमोदन पर विचार करना।

विद्यापरिषद् द्वारा शैक्षणिक सत्र 2015-16 हेतु सीबीसीएस प्रणाली अनुसार कमशः वाणिज्य, शारीरिक शिक्षा, शिक्षाशास्त्र, विधि, संगणक विज्ञान, अंग्रेजी, हिन्दी, इंजीनियरिंग के समस्त विभागों (प्रथम एवं द्वितीय सेमेस्टर), राजनीति विज्ञान, गणित, प्राणीशास्त्र एवं जैव प्रौद्योगिकी विभागों के अध्ययन मण्डल द्वारा पाठ्य विवरण के निर्धारण संबंधी की गई अनुशंसाओं का अनुमोदन किया गया।

उपरोक्त निर्णयानुसार आवश्यक कार्यवाही हेतु फाइल प्रस्तुत
01 एवम् में उपलब्ध कराने हेतु प्रेषित।
(हस्ताक्षर)

7/1/16

उपरोक्त लिये गये निर्णय अनुसार
पत्र प्रखारित किया जाना है। पत्र प्रारूप
अवलोकनार्थ/अनुमोदनार्थ प्रस्तुत।

12/01/16
12-1-16

अनु. अ+ वि.- (अका.)

AR (Acad)
S.O. (Acad.)
श्री वर्रे/श्री राम

Provide photo copy to Hon'ble
of this faculty members
Sri Tiwari (office)

12.1.16
12-1-16

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Dr. D. S. Singh
(old)

B. Sc. (HON'S) IN MATHEMATICS
(Syllabus approved by Board of Studies meeting on 09.07.2015)

Department of Pure & Applied Mathematics

Faculty of Mathematical and Computational Sciences

UNDER THE

CHOICE BASED CREDIT SYSTEM

गुरु घासीदास विश्वविद्यालय
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B. Sc. (HON'S) IN MATHEMATICS

SEMESTER	COURSE CODE	CORE COURSE	CREDIT HOURS
I	MSC 1.1	CALCULUS	03
	MSC 1.2	ANALYTICL GEOMETRY OF THREE DIMENSION	03
II	MSC 2.1	ADVANCE CALCULUS	03
	MSC 2.2	STATICS & DYNAMICS	03
III	MSC 3.1	VECTOR CALCULUS, FOURIER AND LAPLACE TRANSFORMS.	03
	MSC 3.2	ORDINARY DIFFERENTIAL EQUATIONS	03
IV	MSC 4.1	MODERN ALGEBRA	03
	MSC 4.2	PARTIAL DIFFERENTIAL EQUATIONS	03
V (CORE GROUP)	MSC 5.1	ABSTRACT ALGEBRA	04
	MSC 5.2	ANALYSIS	04
	MSC 5.3	MECHANICS - 1	04
V (ELECTIVE GROUP- CHOOSE ANY TWO)	MSO 5.1	MATHEMATICAL STATISTICS - I	04
	MSO 5.2	NUMERACIAL METHODS	04
	MSO 5.3	HYDRO STATICS	04
	MSO 5.4	PROGRAMMING IN C (WITH ANSI FEATURES)	04
	MSO 5.5	COMBINATORIAL MATHEMATICS	04
VI	MSC 6.1	LINEAR ALGEBRA	04

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(CORE GROUP)	MSC 6.2	ADVANCE ANALYSIS	04
	MSC 6.3	MECHANICS - II	04
VI (ELECTIVE GROUP- CHOOSE ANY TWO)	MSO 6.1	MATHEMATICAL STATISTICS - II	04
	MSO 6.2	NUMBER THEORY	04
	MSO 6.3	HDRO DYNAMICS	04
	MSO 6.4	LINEAR PROGRAMMING PROBLEMS	04
	MSO 6.5	MATHEMATICAL FINANCE	04

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4.M. Ray and G. C. Sharma – A Text Book on Dynamics, S. Chand & Company, New Delhi, 2008

MSC 3.1: VECTOR CALCULUS, FOURIER & LAPLACE TRANSFORMS

Integral Transforms: Laplace Transformation, Laplace Transforms of derivatives and integrals, shifting theorems, Dirac's delta function, differentiation and integration of transforms, convolution theorem. Integral equations, Application of Laplace transform in solution of ordinary differential equations. Fourier series expansion, Half-range expansions, Fourier integrals

Vector Calculus: Directional derivatives, the gradient, maximal and normal property of the gradient, tangent planes, Extrema of functions of two variables, method of Lagrange multipliers, constrained optimization problems, Definition of vector field, divergence and curl.

Recommended Books:

Books Recommended :

1. G.B. Thomas and R.L. Finney, Calculus, 9th Ed., Pearson Education, Delhi, 2005.
2. M.J. Strauss, G.L. Bradley and K. J. Smith, Calculus, 3rd Ed., Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi, 2007.
3. E. Marsden, A.J. Tromba and A. Weinstein, Basic Multivariable Calculus, Springer (SIE), Indian reprint, 2005.
4. James Stewart, Multivariable Calculus, Concepts and Contexts, 2nd Ed., Brooks /Cole, Thomson Learning, USA, 2001.
5. Gorakh Prasad, Differential Calculus, Pothishala Pvt. Ltd. Allahabad, 2000.
6. Gorakh Prasad, Integral Calculus, Pothishala Pvt. Ltd. Allahabad, 2000.
7. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Son Inc., New York, 1999.

MSC 3.2 : ORDINARY DIFFERENTIAL EQUATIONS

Ordinary differential equations of first order, initial and boundary conditions, homogeneous equations, linear equations, Exact differential Equation. First order higher degree equations solvable for x, y, p. Singular solution and envelopes.

Linear differential equations with constant coefficients, homogeneous linear differential equations, linear differential equations of second order with variable coefficients.
Variation of Parameter.

Recommended Books:

1. Gorakh Prasad, Integral Calculus, Pothishala Private Ltd. Allahabad,2000.
2. S. Balachandra Rao & H.R. Anuradha, Differential Equations with Applications and Programmes, University Press, Hyderabad, 1996.
3. D.A. Murray, Introductory Course in Differential Equations, Orient Longman , 1967.
4. E. A. Codington, An Introduction to Ordinary Differential Equations, Prentice Hall of India, 1961.
5.B. Rai, D.P. Choudhary & H.I. Freedman, Ordinary Differential Equations, Narosa Publications, New Delhi, 2002
Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Son Inc., New York, 1999.

MSC 4.1 : MODERN ALGEBRA

Sets, Relations, Function or mapping, injective and surjective mappings, Images and inverse images of a set under a mapping, Equivalence relation and partition, partial order relation and Zorn's lemma(without proof), Binary operations.

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Definition of a group and their properties. Subgroups, Union and Intersection of subgroups. Cyclic groups and their properties. Order of an element of a group. Coset decomposition, Lagrange's theorem (only for finite groups) and its consequences. Homomorphism and Isomorphism, Kernel of a homomorphism of a group, Permutation groups, Cayley's theorem. Normal subgroup, Quotient group, Fundamental theorem of Homomorphism. The Isomorphism theorems for groups.

Books Recommended :

1. R.S. Mishra and N.N.Bhattacharya, Fundamental structure in Modern Algebra, Pothishala Pvt Ltd, 1992.

2. P. B. Bhattacharya, S. K.Jain and S. R. Nagpal, First Course in Linear Algebra, Wiley Eastern Ltd. New Delhi, 1983.

3. Ramji Lal, Algebra, Volume I, Shail Publication, 2002.

4. I.I. N. Herstein , Topics in Algebra, Wiley Eastern Ltd, New Delhi, 1975.

5. D.T. Finkbeiner, Introduction to Matrices and Linear transformations, CBS Publishers, New Delhi, 1986.

6. S. Singh and Q. Zameeruddin, Modern Algebra, Vikas Publication House, India.

MSC 4.2: PARTIAL DIFFERENTIAL EQUATIONS

Linear partial differential equations of first order and its classifications, Lagrange's method. Non linear PDE of first order: Charpit's method.

Linear partial differential equation of second and higher order of homogeneous and non homogeneous forms with constant coefficients, Linear partial differential equations reducible to equations with constant coefficents. Second order PDE with variable coefficients, Classifications of second order PDE, Reduction to canonical or normal form. Monge's method. Solution of heat and wave equations in one and two dimensions by method of separation of variables.

Books Recommended :

1. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Son Inc., New York, 1999.
2. Ian N. Sneddon, Elements of Partial Differential Equations, McGraw-Hill Book Company, 1988.
3. S. B. Rao and H. R. Anuradha, Differential Equations, University Press, 1996.
4. W. T. H. Piaggio, Elementary Treatise on Differential Equations and their applications, CBS Publishers, New Delhi, 1985.

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