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

Department	: *Mathematics*
Program Name	: *M.Sc.*

Academic Year : 2017-18

List of Revised Courses

Sr. No.	Course Code	Name of the Course
02.		Differential Geometry of Manifolds
04.		Complex Manifolds
05.		Integration Theory

विभागाध्यक्ष
Head
गणित विभाग
Department of Mathematics
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Minutes of BOS Meeting held on June 29, 2017

Department of Pure and Applied Mathematics
Guru GhsidasVishwavidyalaya, Bilaspur(CG)

The Following Members were Present:

1. Dr. P. P. Murthy (HOD)   : (Chairman)
2. Professor S. K. Srivastava (Subject Expert)   : (VC Nominee)
   (Department of Mathematics, BHU, Varanasi)
3. Professor A. S. Ranadive   :(Member)
4. Dr. P. P. Murthy(Associate Professor)   : (Member)
5. Dr. B. B. Chaturvedi   :(Member)
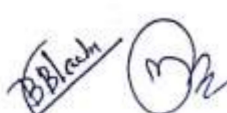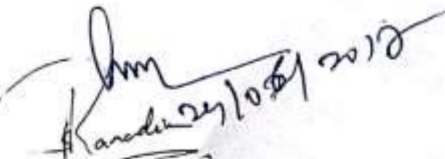6. Dr. Manish Kumar. Gupta   : (Special Invitee)

This meeting is very important for the following purposes:

(i)   No Change in B.Sc. (Honor's) –syllabus under CBCS scheme.

(ii)   Decisions on minor changes and inclusion of the following papers of M.Sc. under non-CBCS scheme:

Sl. No.	Semester	Paper Name	Corrections (if any)	Justification/Remarks
1	M. Sc. III	Differential Geometry of Manifolds – I*	Differential Geometry of Manifolds	Title Name correction only
2	M. Sc. IV	Differential Geometry of Manifolds – II*	Complex Manifolds	Revised the whole syllabus contents
3	M. Sc. IV	Integration Theory*	Minor changes in the contents	The revised one is highly useful in NET examination conducted by UGC/CSIR.
4.	M. Sc. IV	Finsler Geometry*	NA	New Optional paper introduced due to lake of expertise faculty.
5.	M. Sc. III	Integral Equations*	NA	New Optional paper introduced due to lake of expertise faculty. In addition to this it also highly useful in NET examination conducted by UGC/CSIR.

*Syllabus appended at the end.

1/7

03-07-17

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Rest of the papers of M.Sc. Mathematics syllabus is unchanged.

(iii) Confirmation of papers and its contents of M.Sc. Mathematics commencing from 2018-19 under CBCS scheme for discussion and necessary modification after due consideration for approval.

Semester	Course code	Core Course	Credit Hours
I	MSC 1.1	Advanced Abstract Algebra - I	04
	MSC 1.2	Real Analysis	04
	MSC 1.3	Topology	04
	MSC 1.4	Differential Geometry - I	04
	MSC 1.5	Discrete Mathematical Structures	04
II	MSC 2.1	Advanced Abstract Algebra - II	04
	MSC 2.2	Complex Analysis	04
	MSC 2.3	Advanced Topology	04
	MSC 2.4	Differential Geometry - II	04
	MSC 2.5	Graph Theory	04
III (Core Group)	MSC 3.1	Functional Analysis	04
	MSC 3.2	New Paper Introduce	04
III (Optional Group ANY THREE)	MSO 3.1	Fuzzy Sets, Fuzzy Logic and their Applications –I	04
	MSO 3.2	Integral Equations	04
	MSO 3.3	Operations Research- I	04
	MSO 3.4	Differential Geometry of Manifolds	04
	MSO 3.5	Difference Equations –I	04
	MSO 3.6	Theory of Ordinary Differential Equations –I	04

29/06/2017

03-7-17

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	MSO 3.7	Object Oriented Programming with C++	04
	MSO 3.8	Cryptography	04
IV (Core Group)	MSC 4.1	Advanced Functional Analysis	04
	MSC 4.2	NEW PAPER TO BE INTRODUCED	04
IV (Optional Group ANY THREE)	MSO 4.1	Fuzzy Sets, Fuzzy Logic and their Applications–II	04
	MSO 4.2	Finsler Geometry	04
	MSO 4.3	Operations Research- II	04
	MSO 4.4	Complex Manifolds	04
	MSO 4.5	Difference Equation –II	04
	MSO 4.6	Theory of Ordinary Differential Equations –II	04
	MSO 4.7	Project Dissertation	04

It was also decided by the members that HOD is authorized for making corrections, before sending it to the university authority for final approval.

HOD (who is the Chairman of BOS also) informed that Professor S. K. Srivastava is not able to attend the meeting due to problem in getting train reservation and has consented to give his approval via e-mail. HOD also informed that Professor A. S. Ranadive it going to Bhopal for some urgent official work and he has given verbal consent for our decision.

Chairman extended his sincere thanks to all the BOS Members.

P. P. Murthy (HOD & Chairman of the BOS)

Professor A. S. Ranadive (Member - Dean and Professor member quota)

Professor S. K. Srivastava (Retd. Professor) (Department of Mathematics, BHU, Varanasi)

Dr. B. B. Chaturvedi (Member)

Dr. Manish Kumar Gupta (Special Invitee)

3/7

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Syllabus

Differential Geometry of Manifolds*

M.M. 60

Note: A candidate has to attempt five questions. Question No. 1 is compulsory which will consist of short answered type ten questions spread all over the syllabus carrying 20 marks (2 marks each) Rest all questions will carry 10 marks each.

Differentiable manifolds: Smooth maps, chart, atlas, differentiable structure, Definition and examples of differentiable manifolds, Tangent spaces, Vector fields on differentiable manifolds, Vector field and Lie bracket.

Integral curves and Flows: Definition and One parameter group of transformation.

Exterior Algebra, Exterior derivative: Definition, examples related problems.

Linear Connection: Affine connections, Torsion tensor of affine connection, Curvature tensor of affine connection and related problems.

Riemannian manifolds: Definition, Riemannian Connection, Riemannian metric, Sectional curvature tensor, Schur's theorem, Projective curvature tensor, conformal curvature tensor, Semi- symmetric metric connection and related theorems.

Books:

1. R. S. Mishra: A course in Tensor with applications to Riemannian Geometry, Pothishala (Pvt.) Ltd, Allahabad, 1965.
2. Y. Matsushita: Differentiable manifolds, Marcel Dekkar, 1972.
3. B. B. Sinha: an Introduction to modern differential geometry, Kalyani Prakashan, New Delhi, 1982.

Complex Manifolds*

M.M. 60

Note: A candidate has to attempt five questions. Question No. 1 is compulsory which will consist of short answered type ten questions spread all over the syllabus carrying 20 marks (2 marks each) Rest all questions will carry 10 marks each.

Complex Manifold and Almost complex manifold: Definition and example, Nijenhuis tensor, Eigen Values of an almost complex structure, Existence theorem and integrability condition, contravariant and covariant almost analytic vector fields.

Almost Hermite manifold: Nijenhuis tensor, Almost analytic vector fields, Curvature in almost Hermite manifold, Holomorphic Sectional Curvature, Linear connection in an almost Hermite manifold

Kaehler Manifolds: Holomorphic Sectional Curvature, Bochner Curvature tensor, Affine connection in almost Kaehler manifold.

Nearly Kaehler Manifolds: Definition, Projective correspondence between two Nearly Kaehler manifolds, Curvature identities.

Para Kaehler Manifolds: Definition, Curvature Identities and conformal flatness of parakaehler manifold.

Books:

1. R. S. Mishra: A course in Tensor with applications to Riemannian geometry, Pothishala (Pvt.) Ltd, Allahabad.
2. B. B. Sinha: an Introduction to modern differential geometry, Kalyani Prakashan, New Delhi, 1982.

4/7

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3. K. Yano: Structure of Manifolds, World Scientific Publishing Co. Pvt. Ltd., 1984.
4. Complex Manifolds and Contact

Integration Theory*

M.M. 60

Note: A candidate has to attempt five questions. Question No. 1 is compulsory which will consist of short answered type ten questions spread all over the syllabus carrying 20 marks (2 marks each). Rest all questions will carry 10 marks each.

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Signed measure, Hahn Decomposition theorem, mutually singular measure. Randon Nikodyn theorem. Lebsegue decomposition, Riesz representation theorem, Extension theorem (caratheodory), Lebseguestieltjes Integral.

Measurability in a Product Space, the Product measure and Fubini's theorem.

Differentiation and Integration, Decomposition in absolutely continuous and singular part.

Recommended Books:

1. H.L. Royden: Real analysis, Macmillian publishing co. Inc, New york
2. S.K.Berberian : Measure and Integration, Chelsea publishing company, New Delhi
3. G.D.Berra: Measure theory and Integration, Willey Eastern Limited
4. J.H.Williamson: Legsegue Integration, Holt Rinehart and Winston, New York, 1962.

INTEGRAL EQUATIONS*

M.M. 60

Note: A candidate has to attempt five questions. Question No. 1 is compulsory which will consist of short answered type ten questions spread all over the syllabus carrying 20 marks (2 marks each). Rest all questions will carry 10 marks each.

Basic concept of Integral Equations, Classification of integral equations, Libnitz's rule of differentiation under the sign of integration, transformation of differential equation into integral equation and vice-versa.

Volterra's Integral Equations: Resolvent Kernel, Method of successive approximation.

29/06/2017

5/7

03-07-17