Plan of Action and Achieved of the Department of Mathematics for the session 2022-23

Serial No.	Plan of Action	Details of the Plan	Achieved or not	Reason/ Remarks
1	Induction Programme	a) Overview of curriculum based on CBCS pattern and evaluation pattern (CGPA and SGPA), feedback mechanism is given, as the system is a new concept for the students b) The induction programme is conducted to familiarize the students about the process of teaching learning in the college, rules and regulations of the college and university. c) The programme will provide a scope of interaction with the faculty members and peer group d) Briefing on extensive social activities through NSS and NCC, extracurricular and cultural events. e) Addressing the queries of new joiners.	Yes	Induction Programme conducted on 20/09/2022
2	Curriculum Module Allocation	a) The department follows the curriculum and syllabus as prescribed by the affiliating university (Bankura University). In each semester the syllabus is distributed in modules and the stipulated syllabus is completed, and the topics are taught as per the credits allocated to each topic. b) Distribution of syllabus in modules and	Yes (Annexures 1 and 2 stating Syllabus Allocation are attached) CO PO uploaded in the website	Syllabus Module Allocation is done in a departmental meeting held on 19/07/2022.

		unitization of syllabus were prepared well before the commencement of classes and executed in a planned and systematic manner. c) Course Outcome, Programme Outcome and Programme Specific Outcome are also formulated.		
3	Maintenance of Students Attendance Register	Day to day attendance is recorded in the Students' Attendance Register.	Yes	
4	Continuous Assessment of Students	Continuous assessment is carried out by the department in the form of Surprise Test, Oral Test etc. Internal assessment examinations are held prior to every end semester examinations for the courses of Bankura University.	Yes	Internal Examination of odd semesters were conducted on 16th and 17th November 2022. Internal Examination of even semesters were conducted on 11th and 12th May 2023.
5	Completion of syllabus	Syllabus is covered for all courses of UG program within the stipulated time period.	Yes	
6	Result Analysis	Result analysis is done according to result sheet provided by the Universities. After critical analysis of the results, the students are advised about how to improve in University examination.	Yes (Annexure 3 stating result analysis of Semesters I to VI are attached)	
7	Remedial Classes	Remedial classes are conducted for each semester on the basis of suggestions provided by the student representatives who propose the topics that require special attention. Sometimes in the remedial classes, evaluated and assessed answer scripts are shown to the students for their self-analysis and better understanding of the subject.	Yes	
8	Students Support Facilities	a) E books and lecture PDFs are supplied through ERP b) PPTs are	Yes	

		uploaded in college ERP c) Concessions and free-ship to economically weak students. d) Career guidance e) Curricular and extra-curricular activities in online f) Prize Awarded as encouragement to achievers in studies or sports g) Merit-based scholarships		
9	Library Facilities	a) Central Library is a rich in collection of books of different branches of Mathematics. b) The central library is automated and students have bar-coded library cards. c) The central library has a spacious reading hall. d) Departmental Library operates with limited resource, and caters primarily to financially weak students.	Yes	
10	Student Seminar	Students-seminar are organized in online mode to ensure a) Develop communication skills of students b) Boost their confidence c) Develop their presentation skills d) Overcome the fear of facing the audience Topics of the seminar may be departmental syllabi based.	Yes	
11	Co-curricular Activities	Students of the department participate in various co-curricular activities such as Quiz contest and other cultural programmes organized in the college. .	Yes	Students participated in programmes in college and outside also.
12	Students Feedback	Feedback is taken from students for individual teachers and analyzed for future improvement.	Yes	
13	Research & Publications	Faculty members are constantly engaged in paper publications,	Yes (Annexure 4	

		book chapters and paper presentations in seminars.	stating departmental publications in the session 2022-2023 is attached)	
14	Developing E-Content	Faculty Members upload e-notes at Study Materials Section in College ERP which the students can access free. Besides e-materials on important topics are uploaded in the college website as well.	Yes	
15	Perspective Plan	5 years Perspective Plan is framed after discussion in departmental meeting with suggestions from student's representative and IQAC Coordinator	Yes Uploaded in the website	

Annexure 1: Syllabus Module Allocation of Mathematics Semester I and Semester II (2022-23) under Bankura University

SYLLABUS MODULE

Mathematics Honours

Semester I (BKU)

Course Code	Course Title	Faculty Name	Full Marks	Credit	No. of Classes
SH/MTH/ 101/C-1	Calculus, Geometry & Vector Analysis	RB,CDG	50	6	60 (Tentatively)
SH/MTH/102/C2	Algebra	AI,MN	50	6	60
SH/MTH/101/GE1	Calculus, Geometry & Vector Analysis	CDG	50	6	60 (Tentatively)

Semester II (BKU)

Course Code	Course Title	Faculty Name	Full Marks	Credit	No. of Classes
SH/MTH/201/C3	Real Anlysis	AI,RB	50	6	60 (Tentatively)
SH/MTH/202/C4	Group Theory I	CDG,AI	50	6	60
SH/MTH/203/GE2	Algebra	CDG	50	6	60 (Tentatively)

Semester III (BKU)

Course Code	Course Title	Faculty Name	Full Marks	Credit	No. of Classes
SH/MTH/301/C5	Theory of Real Functions & Introduction to Metric Space	CD,RB	50	6	60 (Tentatively)
SH/MTH/302/C6	Group Theory-I	MN	50	6	60
SH/MTH/303/C7	Numerical Methods Numerical Methods Lab	AI	50	6	60
SH/MTH/304/GE3	Algebra	CDG,RB	50	6	60
SH/MTH / 305/SEC-1	Programming Using C	AI	50	2	20

Semester IV (BKU)

Course Code	Course Title	Faculty Name	Full Marks	Credit	No. of Classes
SH/MTH/401/C8	Riemann Integration and Series of Functons	MN	50	6	60 (Tentatively)
SH/MTH/402/C9	Multivariate Calculus	AI	50	6	60
SH/MTH/403/C10	Ring Theory and Linear Algebra-I	RB	50	6	60
SH/MTH/404/GE4	Differential Equations and Vector Calculus	CDG	50	6	60
SH/MTH/405/SEC2	Graph Theory (SEC T4)	RB	50	6	60

Semester V (BKU)

Course Code	Course Title	Faculty Name	Full Marks	Credit	No. of Classes
SH/MTH/501/C11	Partial Differential Equations and Applications	RB	50	6	60 (Tentatively)
SH/MTH/502/C12	Group Theory - II	MN	50	6	60
SH/MTH/503/DSE1	Linear Programming	CD	50	6	60
SH/MTH/504/DSE2	Probability and Statistics	AI	50	6	60

Semester VI (BKU)

Course Code	Course Title	Faculty Name	Full Marks	Credit	No. of Classes
SH/MTH/601/C13	Metric Spaces and Complex Analysis	RB	50	6	60 (Tentatively)
SH/MTH/602/C14	Ring Theory and Linear Algebra II	CDG	50	6	60
SH/MTH/603/DSE3	Number Theory	MN	50	6	60
SH/MTH/604/DSE4	Project Work	AI	50	6	60

AI== DR. MD. ASIF IKBAL

RB== DR. RIMA BARIK

MN== SRI MADHAB NANDI

CDG== SRI CHANDI DAS GOP

References:

For Calculus, Geometry & Vector Analysis (C1)

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) P. Ltd. (Pearson Education), Delhi, 2007.
3. H. Anton, I. Bivens and S. Davis, Calculus, 7th Ed., John Wiley and Sons (Asia) P. Ltd., Singapore, 2002.
4. R. Courant and F. John, Introduction to Calculus and Analysis (Volumes I & II), SpringerVerlag, New York, Inc., 1989.
5. B.K. Kar, Advanced Analytic Geometry and Vector Analysis, Books & Allied Pvt. Ltd.
6. R.M. Khan, Analytical Geometry of Two and Three Dimensions and Vector Analysis, New Central Book Agency
7. T. Apostol, Calculus, Volumes I and II.
8. S. Goldberg, Calculus and mathematical analysis.
9. Marsden, J., and Tromba, Vector Calculus, McGraw Hill.
10. Maity, K.C. and Ghosh, R.K. Vector Analysis, New Central Book Agency (P) Ltd. Kolkata (India).
11. M.R. Speigel, Schaum's outline of Vector Analysis

For Algebra(C2)

1. Titu Andreescu and Dorin Andrica, Complex Numbers from A to Z, Birkhauser, 2006.
2. Edgar G. Goodaire and Michael M. Parmenter, Discrete Mathematics with Graph Theory, 3rd Ed., Pearson Education (Singapore) P. Ltd., Indian Reprint, 2005.
3. David C. Lay, Linear Algebra and its Applications, 3rd Ed., Pearson Education Asia, Indian Reprint, 2007.
4. K.B. Dutta, Matrix and linear algebra.
5. K. Hoffman, R. Kunze, Linear algebra.
6. W.S. Burnstine and A.W. Panton, Theory of equations.

For Real Analysis (C3)

1. R.G. Bartle and D. R. Sherbert, Introduction to Real Analysis, John Wiley and Sons (Asia) Pvt. Ltd.
2. Gerald G. Bilodeau , Paul R. Thie, G.E. Keough, An Introduction to Analysis, Jones & Bartlett.
3. Tom M. Apostol, Mathematical Analysis, Narosa Publishing House

4. W. Rudin, Principles of Mathematical Analysis, Tata McGraw-Hill
5. Terence Tao, Analysis I, Hindustan Book Agency.
6. S.K. Mapa, Introduction to Real Analysis, Levant Books, India
7. S.C.Mallik, Savita Arora, Mathematical Analysis, New age International Publication

For Group Theory (C4)

1. M. Artin, Abstract Algebra, 2nd Ed., Pearson.
2. Joseph A. Gallian, Contemporary Abstract Algebra, Narosa Publishing House.
3. Joseph J. Rotman, An Introduction to the Theory of Groups, Springer.
4. I.N. Herstein, Topics in Algebra, Wiley Eastern Limited, India.
5. D.S. Malik, John M. Mordeson and M.K. Sen, Fundamentals of abstract algebra, McGraw-Hill.

For Theory of Real Functions & Introduction to Metric Space (C5)

1. R. Bartle and D.R. Sherbert, Introduction to Real Analysis, John Wiley and Sons.
2. K.A. Ross, Elementary Analysis: The Theory of Calculus, Springer.
3. Tom M. Apostol, Mathematical Analysis, Narosa Publishing House.
4. W. Rudin, Principles of Mathematical Analysis, Tata McGraw-Hill
5. Terence Tao, Analysis II, Hindustan Book Agency.
6. S. Kumaresan, Topology of Metric Spaces, 2nd Ed., Narosa Publishing House.
7. G.F. Simmons, Introduction to Topology and Modern Analysis, McGraw-Hill.
8. Joydeep Sengupta, Metric Space, U. N. Dhur Publication

For Group Theory-I (C6)

6. M. Artin, Abstract Algebra, 2nd Ed., Pearson.
7. Joseph A. Gallian, Contemporary Abstract Algebra, Narosa Publishing House.
8. Joseph J. Rotman, An Introduction to the Theory of Groups, Springer.
9. I.N. Herstein, Topics in Algebra, Wiley Eastern Limited, India.
10. D.S. Malik, John M. Mordeson and M.K. Sen, Fundamentals of abstract algebra, McGraw-Hill.

For Numerical Methods Numerical Methods Lab (C7)

1. M.K. Jain, S.R.K. Iyengar and R.K. Jain, Numerical Methods for Scientific and Engineering Computation, 6th Ed., New age International Publisher, India.
2. C.F. Gerald and P.O. Wheatley, Applied Numerical Analysis, Pearson Education, India.
3. S.A. Molla, Numerical Analysis and Computational Proceedures, Books & Allied Ltd.

For Riemann Integration and Series of Functons (C8)

1. K.A. Ross, Elementary Analysis, The Theory of Calculus, Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint.
2. R.G. Bartle D.R. Sherbert, Introduction to Real Analysis, John Wiley and Sons (Asia) Pvt. Ltd.
3. Santi Narayan, Dr. P. K. Mittal, Integral calculus, S. Chand.
4. T. Apostol, Calculus I, II, Wiley Student Edition.

For Multivariate Calculus (C9)

1. E. Marsden, A.J. Tromba and A. Weinstein, Basic Multivariable Calculus, Springer (SIE), Indian reprint.
2. James Stewart, Multivariable Calculus, Concepts and Contexts, Brooks /Cole, Thomson Learning, USA.
3. Tom M. Apostol, Mathematical Analysis, Narosa Publishing House
4. Courant and John, Introduction to Calculus and Analysis, Vol II, Springer
5. W. Rudin, Principles of Mathematical Analysis, Tata McGraw-Hill
6. Marsden, J., and Tromba, Vector Calculus, McGraw Hill.
7. Maity, K.C. and Ghosh, R.K. Vector Analysis, New Central Book Agency (P) Ltd. Kolkata (India).
8. Terence Tao, Analysis II, Hindustan Book Agency, 2006
9. M.R. Speigel, Schaum's outline of Vector Analysis.

For Ring Theory and Linear Algebra-I (C10)

1. M. Artin, Abstract Algebra, 2nd Ed., Pearson.
2. Joseph A. Gallian, Contemporary Abstract Algebra, 4th Ed., Narosa Publishing House, New Delhi.
3. S. Lang, Introduction to Linear Algebra, Springer
4. Kenneth Hoffman, Ray Alden Kunze, Linear Algebra, Prentice-Hall of India Pvt. Ltd.

For Graph Theory(SEC 2)

1. Edgar G. Goodaire and Michael M. Parmenter, Discrete Mathematics with Graph Theory, Pearson Education (Singapore) P. Ltd.
2. Swapan Kumar Sarkar, A Textbook of Discrete Mathematics, S. Chand
3. RM. Somsundaram, Discrete Mathematics, Prentice Hall Of India

For Partial Differential Equations and Applications (C11)

1. Tyn Myint-U and Lokenath Debnath, Linear Partial Differential Equations for Scientists and Engineers, Springer, Indian reprint.
2. S.L. Ross, Differential equations, John Wiley and Sons, India.
3. Sneddon, I. N., Elements of Partial Differential Equations, McGraw Hill.
4. Miller, F. H., Partial Differential Equations, John Wiley and Sons.

For Group Theory II (C12)

1. M. Artin, Abstract Algebra, Pearson.
2. Joseph A. Gallian, Contemporary Abstract Algebra.
3. D.S. Malik, John M. Mordeson and M.K. Sen, Fundamentals of abstract algebra.
4. I.N. Herstein, Topics in Algebra, Wiley Eastern Limited, India.

For Linear Programming (DSE1)

1. Hamdy A. Taha, Operations Research, An Introduction, Prentice-Hall India
2. G. Hadley, Linear Programming, Narosa Publishing House

For Probability and Statistics (DSE2)

1. A. Gupta, Ground work of Mathematical Probability and Statistics, Academic publishers.

2. Irwin Miller and Marylees Miller, John E. Freund, Mathematical Statistics with Applications, 7th Ed., Pearson Education, Asia.
3. N.G.Das, Probability, Mc Graw Hill.
4. N.G.Das, Statistical Methods, Mc Graw Hill.

For Metric Spaces and Complex Analysis (C13)

1. S. Kumaresan, Topology of Metric Spaces, Narosa Publishing House.

2. G.F. Simmons, Introduction to Topology and Modern Analysis, McGraw-Hill.
3. James Ward Brown and Ruel V. Churchill, Complex Variables and Applications, 8th Ed., McGraw – Hill International Edition.
4. Joydeep Sengupta, Metric Space, U. N. Dhur Publication.

For Ring Theory and Linear Algebra II(C14)

1. S. Lang, Introduction to Linear Algebra, Springer.
2. Gilbert Strang, Linear Algebra and its Applications, Thomson.
3. S. Kumaresan, Linear Algebra- A Geometric Approach, Prentice Hall of India.
4. Kenneth Hoffman, Ray Alden Kunze, Linear Algebra, Prentice-Hall of India Pvt. Ltd.
5. M. Artin, Abstract Algebra, Pearson.

For Number Theory (DSE 3)

1. David M. Burton, Elementary Number Theory, Tata McGraw-Hill .
2. Neville Robinns, Beginning Number Theory, Narosa Publishing House Pvt. Ltd.

KHATRA ADIBASI MAHAVIDYALAYA

SYLLABUS MODULE

Mathematics Programme

Semester I

Semester	Course Code	Course Title	Faculty Name	Full Marks	Credit	No. of Classes
I	SP/MTH/101/C - 1A	Calculus and Geometry	AI, CDG	50	6	60 (Tentatively)

Semester II

Semester	Course Code	Course Title	Faculty Name	Full Marks	Credit	No. of Classes
II	SP/MTH/201/C - 1B	Algebra	AI, CDG	50	6	60 (Tentatively)

Semester III

Semester	Course Code	Course Title	Faculty Name	Full Marks	Credit	No. of Classes
III	SP/MTH/301/C -1C	Algebra	RB,MN	50	6	60 (Tentatively)
III	SP/MTH/304/ SEC-1	Logic & Sets	AI	50	2	

Semester IV

Semester	Course Code	Course Title	Faculty Name	Full Marks	Credit	No. of Classes
IV	SP/MTH/401/C - 1D	Differential Equations and Vector Calculus	CDG	50	6	60 (Tentatively)
IV	SP/MTH/404/ SEC-2	Graph Theory	RB	50	2	

AI== Dr. Md. Asif Ikbal

CDG== SRI Chandi Das Gop

MN== Sri Madhab Nandi

RB== Dr. Rima Barik

References:

1. Das, Mukherjee, Differential Calculus, U.N.Dhur & Sons Pvt. Ltd.
2. Shantinarayan, Mittal, Differential Calculus, S, Chand Publications
3. Chakraborty, Ghosh, Advanced Analytical Geometry, U.N.Dhur & Sons Pvt. Ltd.
4. Maity, Ghosh, Differential Equations, New Central Book Agency
5. S.K. Mapa, Real Analysis, Levant

Annexure 3: Result Analysis of the Department of Mathematics for the session 2022-2023

Result Analysis of Department of Mathematics 2022-2023:

Name of the Course/programme	Total No. of Students Appeared	No of Students Passed	Pass Percentage
U.G. 5th Semester (Hons) Bankura Univarsity	**09**	**06**	**75%**
U.G. 6th Semester (Hons) Bankura Univarsity	**09**	**03**	**33.3%**

Annexure 4: Departmental Research and Publications in the session 2022-2023

Sl. No.	Title of the publication with page no. and year of publication	Name of the of publisher	ISSN/ ISBN No.	No. of Co-author	Whether you are the main author
1	**Chapter Name:** The Use of ICT for Mathematics Teachers' Education; **Book Name:** Information and Communication Technology in Teacher education **Page Number:** 168 to 179	Crescent Publishing Corporation, India	ISBN: 978-93-9177146-1	Nil	Yes
2	**Title of the Paper:** OER in Mathematics: Broadening the Boundaries **Published in:** Proceedings of Two-day National Seminar On Creation and Use of Open Educational Resources **Page Number:** 113 to 122	Principal, Banwarilal Bhalotia College, Asansol, Paschim Barddhaman, West Bengal, India	ISBN: 978-93-83659-69-2	Nil	Yes
4	Mathematical Studies of non-Newtonian Blood Flow through a Patient-Specific Atherosclerotic Artery (Page No441-451)	Journal of Applied Nonlinear Dynamics 12(3) 2023	ISSN: 2164-6457 (Print)	2	Yes
5	Calculus and its Application in Economics and Business; (**Chapter 3, Limit and Continuity**), Page No.- 65-85, 2022	Netaji Nagar Day College, Kolkata-92, W.B. (National Level)	ISBN: 978-81-956899-0-3	Single Author	Yes

Paper Presentation

Sl. No.	Title of the invited lecture /paper presented	Title of Conference/ Seminar with date	Organized by	Whether International/ National/State or University level
1	Presented the paper 'Philosophy of Mathematics: A Review from Ancient to Present'	One Day International Level Seminar on Philosophical Interventions in Language, Literature and Critical Thinking (23/03/2023)	Department of Philosophy, English, Bengali, Sanskrit and Political Science under the aegis of Internal Quality Assurance Cell, Khatra Adibasi Mahavidyalaya	International
2	Presented the paper 'OER in Mathematics: Broadening the Boundaries'	Two Day National Seminar on Use of Open Educational Resources (23/06/2023 & 24/06/2023)	Organized by IQAC, Banwarilal Bhalotia College, Sponsored by NAAC	National