**Plan of Action and Achieved of the Department of Mathematics for the session 2018-19**

| 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<br>b) The induction programme is conducted to familiarize the students to the college environment, its facilities and infrastructure including hostels, library as well as brief overview of the college website is presented before the students.<br>c) The programme will provide a scope of interaction with the faculty members and peer group<br>d) Briefing on extensive social activities through NSS and NCC, extracurricular and cultural events.<br>e) Addressing the queries of new joiners. | Yes | Induction Programme conducted on 21/08/2018 |
| 2 | Curriculum Module Allocation | a) The department follows the curriculum and syllabus as prescribed by the affiliating universities (Bankura University and Burdwan 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 | Yes (Annexures 1 and 2 stating Syllabus Allocation and CO, PO respectively are attached) | Syllabus Module Allocation for Semesters I, II, III and IV (BKU) and 3rd year of BU is done at Departmental Meeting held on on 14/08/2018 |

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|---|---|---|---|---|
| | | topic.<br>b) Distribution of syllabus in modules and unitization of syllabus were prepared well before the commencement of classes and executed in a planned and systematic manner.<br>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 Student Attendance Registers. | Yes | |
| 4 | Continuous Assessment of Students | Continuous assessment is carried out by the department in the form of Test (in written format) for the courses of Burdwan University.<br><br>Internal assessment examinations are held prior to every end semester examinations for the courses of Bankura University. | Yes | Test for 3rd year was held from 8th February to 13th February 2019.<br><br>Internal Examination of Semester I was held on 28th and 29th September 2018.<br><br>Internal Examination of Semester III was held on 26th , 27th and 29th September 2018.<br><br>Internal Examination of Semester II was held on 28th and 29th March 2019.<br><br>Internal Examination of Semester IV was held on 26th ,27th and 29th March 2019. |

| | | | | |
|---|---|---|---|---|
| 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.<br><br>After critical analysis of the results, the students are advised about how to improve in University examination. | Yes (Annexure 3 stating result analysis of Semester I,II,III and IV and 3rd year of BU students 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) Spacious airy clean classrooms<br>b) Clean and maintained toilets<br>c) Clean drinking water facilities<br>d) Concessions and free-ship to economically weak students.<br>e) Ragging free campus<br>f) Free wi fi facilities<br>g) Career guidance<br>h) Curricular and extra-curricular activities<br>i) NCC training opportunity<br>j) Sports and Gym facilities<br>k) Library and Labs<br>l) Prize Awarded as encouragement to achievers in studies or sports<br>m) Merit-based scholarships | Yes | |
| 9 | Library Facilities | a) Central Library is a rich in collection of books of different branches of Mathematics.<br><br>b) The central library is automated and students have bar-coded library | Yes | |

| | | | | |
|---|---|---|---|---|
| | | cards.<br><br>c) The central library has a spacious reading hall.<br><br>d) Departmental Library operates with limited resource, and caters primarily to financially weak students. | | |
| 10 | Student Seminar | Students-seminar are organized to ensure<br>a) Develop communication skills of students<br>b) Boost their confidence<br>c) Develop their presentation skills<br>d) Overcome the fear of facing the audience<br><br>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.<br>. | Yes | Students of the department also participated in various cultural programmes held in the college |
| 12 | Students Feedback | Feedback is taken from students for individual teachers and analysed for future improvement. | Yes | |
| 13 | Research & Publications | Faculty members are constantly engaged in paper publications, book chapters and paper presentations in seminars. | Yes (Annexure 4 stating departmental publications in the session 2018-2019 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 | |

**Annexure 1: Syllabus Module Allocation of Mathematics Semester I and Semester II (2018-19) 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/C1 | Calculus, Geometry & Differential Equation | AI,SD | 50 | 6 | 60 (Tentatively) |
| SH/MTH/102/C2 | Algebra | MN | 50 | 6 | 60 |
| SH/MTH/103/GE1 | Calculus, Geometry & Differential Equation | AI,SD | 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,MN | 50 | 6 | 60 (Tentatively) |
| SH/MTH/202/C4 | Differential Equations and Vector Calculus | CDG | 50 | 6 | 60 |
| SH/MTH/203/GE2 | Real Anlysis | AI,MN | 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 | MN,SD | 50 | 6 | 60 (Tentatively) |
| SH/MTH/302/C6 | Group Theory-I | AI | 50 | 6 | 60 |
| SH/MTH/303/C7 | Numerical Methods Numerical Methods Lab | MN,SD | 50 | 6 | 60 |
| SH/MTH/304/GE3 | Algebra | MN,SD | 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 | AI,CD | 50 | 6 | 60 (Tentatively) |
| SH/MTH/402/C9 | Multivariate Calculus | MN,AI | 50 | 6 | 60 |
| SH/MTH/403/C10 | Ring Theory and Linear Algebra-I | MN,CD | 50 | 6 | 60 |
| SH/MTH/404/GE4 | Differential Equations and Vector Calculus | CD | 50 | 6 | 60 |
| SH/MTH/405/SEC2 | Graph Theory (SEC T4) | MN | 50 | 6 | 60 |

## 3rd Year (BU)

| Course Code | Course Title | Faculty Name | Full Marks | No. of Classes |
|---|---|---|---|---|
| Paper V | Group A+ Group B + Group C | MN | 100 | 100 |
| Paper VI | Group A + Group B | AI | 50 | 50 |
| | Group C + Group D | SD | 50 | 50 |
| Paper VII | Group A + Group B | AI | 60 | 60 |
| | Group C | SD | 40 | 40 |
| Paper VIII | Group A + Group B | CDG | 50 | 50 |
| Paper IX | Computer Aided Numerical Practical | AI | 50 | 50 |

**AI== DR. MD. ASIF IKBAL**

**SD== SRI SANDIP DERIA**

**MN== SRI MADHAB NANDI**

**SH== SRI SUMANTA HAZRA**

## References:

### For Calculus, Geometry & Differential Equation (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. S.L. Ross, Differential Equations, 3rd Ed., John Wiley and Sons, India, 2004.
6. Murray, D., Introductory Course in Differential Equations, Longmans Green and Co.
7. G.F.Simmons, Differential Equations, Tata Mcgraw Hill.
8. T. Apostol, Calculus, Volumes I and II.
9. S. Goldberg, Calculus and mathematical 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 Differential Equations and Vector Calculus (C4)


1. Belinda Barnes and Glenn R. Fulford, Mathematical Modeling with Case Studies, A Differential Equation Approach using Maple and Matlab, 2nd Ed., Taylor and Francis group, London and New York.
2. C.H. Edwards and D.E. Penny, Differential Equations and Boundary Value problems Computing and Modeling, Pearson Education India.
3. S.L. Ross, Differential Equations, John Wiley and Sons, India.
4. Martha L Abell, James P Braselton, Differential Equations with MATHEMATICA, Elsevier Academic Press.
5. G.F.Simmons, Differential Equations, Tata Mc Graw 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. M.R. Speigel, Schaum's outline of Vector Analysis


## 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)


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 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 Paper V (BU)

**Analysis-III**

10. Introduction to Real Analysis by R. G. Bartle and D. R. Sherbert
11. Principal of Mathematical Analysis by Walter Rudin
12. Mathematical Analysis by S. C. Malik & S. Arora.

**Complex Analysis**

13. Complex Analysis by U.C De
14. Complex Variables: Theory and Applications by H.S. Kasana
15. Functions of one complex variable by J.B. Conway

**Metric spaces**

16. Metric Space by Joydeep Sengupta
17. Metric Space and Complex Analysis by A. K. Banerjee and A. Dey

## For Paper VI (BU)

**Elements of Continuum Mechanics**

1. N.C. Rana and P.S. Joag

**Classical Dynamics, Dynamics of a system of particles and rigid body**

1. Analytical Dynamics Of A Particle Including Elements Of Statics, by S Ganguly, S Saha.
2. Advanced Analytical Dynamics, by J. G. Chakravorty and P. R. Ghosh.

**Statics**

1. E.J.Routh

**Hydrostatics**

1. J.M. Kar

## For Paper VII (BU)

**Mathematical Probability**

1. Mathematical Probability by Banerjee, De & Sen.
2. Fundamentals of Mathematical Statistics by S.C. Gupta V.K. Kapoor.
3. Mathematical Probability by N.G. Das

**Statistics**

4. Mathematical Statistics by Banerjee, De & Sen.
5. Statistics by N.G. Das
6. Fundamentals of Mathematical Statistics by S.C. Gupta V.K. Kapoor.

**Operations Research**

7. Introduction to Operations Research by F.S. Hillier and G.J. Lieberman
8. Linear Programming And Game Theory by Chakraborty &Ghosh
9. Operations Research by A.Taha

## For Paper VIII (BU)

**Numerical Analysis**

1. Numerical Methods for Scientific and Engineering by M.K. Jain, S.R.K. Iyengar and R.K. Jain.
2. Introductory Methods of Numerical Analysis by S. S. SASTRY.
3. Numerical Methods by S.A. Molla

**Computer programming**

4. Let us C by Kanetkar

## For Paper IX (BU)

**Computer Aided Numerical Practical**

1. Numerical Methods for Scientific and Engineering by M.K. Jain, S.R.K. Iyengar and R.K. Jain.

# 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, Geometry & Differential Equation | AI, SD | 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 | Real Analysis | AI, SD | 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 | AI, SD | 50 | 6 | 60 (Tentatively) |
| III | SP/MTH/304/ SEC-1 | Logic and Sets | | | | |

### 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 | AI, SD | 50 | 6 | 60 (Tentatively) |
| IV | SP/MTH/404/ SEC-2 | Graph Theory | | | | |

**AI== DR. MD. ASIF IKBAL**

**SD== SRI SANDIP DERIA**

## 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


## Annexure 3: Result Analysis of the Department of Mathematics for the session 2018-2019

**Result Analysis of Department of Mathematics 2018-2019:**

| Name of the Course/programme | Total No. of Students Appeared | No of Students Passed | Pass Percentage |
|---|---|---|---|
| U.G. 3rd Year (Hons) Burdwan University | 10 | 05 | 50% |
| U.G. 2nd Year (Hons) Burdwan University | 04 | 04 | 100% |
| U.G. 1st Semester (Hons) Bankura University | 10 | 04 | 40% |
| U.G. 2nd Semester (Hons) Bankura University | 10 | 10 | 100% |
| U.G. 3rd Semester (Hons) Bankura University | 09 | 05 | 55.5% |
| U.G. 4th Semester (Hons) Bankura University | 08 | 08 | 100% |

## Annexure 4: Departmental Research and Publications in the session 2018-2019

## Publications

| 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 |
|---|---|---|---|---|---|
| 01 | Viscoelastic blood flow through stenosed artery in the presence of magnetic field (Page No. 1-15): Md Asif Ikbal | *Int. J. Biomedical Engineering and Technology* (Vol. 30, No. 01), June 2019 | ISSN: 1752-6418 (Print) Web of Science, Scopus Journal, I. factor: 0.285 | Single Author | Yes |

- **Participate in National level workshop on Advance Mathematics (WEM 2019): June 13-22, 2019: Organized by Calcutta Mathematical Society**