MA201 Mathematics III

Complex Analysis & Partial Differential Equations

Monsoon Semester of AY 2023-2024 (July-November 2023)

MGPP, AC, ST, SP

IIT Guwahati

Divisions, Lecture & Tutorial Timings

Division	Branches	Lecture Timings & Venue	Tutorial Timing
Divison-1	ECE, EEE	A-Slot & 5G3 (Tue 9 am, Wed 10 am, Thur 11 am)	Monday 8 am
Divison-2	CL, CST	A-Slot & 5G4 (Tue 9 am, Wed 10 am, Thur 11 am)	Monday 8 am
Divison-3	ME, BSBE	D-Slot & 5G3 (Mon 11 am, Thur 9 am, Fri 10 am)	Monday 8 am
Divison-4	CE, M&C, Energy	D-Slot & 5G4 (Mon 11 am, Thur 9 am, Fri 10 am)	Monday 8 am

Office Locations & Emails of the Instructors

Division	Complex Analysis	Partial Differential Equations
Division-1 ECE, EEE	Dr. Arup Chattopadhyay (arupchatt@iitg.ac.in, E1-209)	Dr. Satyajit Pramanik (satyajitp@iitg.ac.in, E1-305)
Division-2 CL, CST	Dr. M. Guru Prem Prasad (mgpp@iitg.ac.in, E-207)	Dr. Sweta Tiwari (swetatiwari@iitg.ac.in, E1-203)
Division-3 ME, BSBE	Dr. Arup Chattopadhyay (arupchatt@iitg.ac.in, E1-209)	Dr. Satyajit Pramanik (satyajitp@iitg.ac.in, E1-305)
Division-4 CE, M&C, Energy	Dr. M. Guru Prem Prasad (mgpp@iitg.ac.in, E-207)	Dr. Sweta Tiwari (swetatiwari@iitg.ac.in, E1-203)

Course Coordinator: Dr. M. Guru Prem Prasad

For any queries or doubts or help in MA201, Please feel free to approach any of the course instructors.

Tutors & their Emails (Pl. Note the Tutorial Class Venue)

T. Group	T. Venue	Tutor	Email (@iitg.ac.in)
T01	1103	Mijanur Rahaman	mrahaman
T02	1201	Sunil	sunil.sunil
T03	1202	Anjali	manjali
T04	1205	Atul Kumar Rai	atul.kumar
T05	2101	Saikat Giri	saikat.giri
T06	2201	Tanay Kumar Karmakar	tanay.kumar
T07	2202	Sunit Ghosh	g.sunit
T08	2203	Gaurav Kumar	gaurav_kumar
T09	2204	Anjali Singh	anjalisingh
T10	5001	Deepa Antony	deepa172123009
T11	5002	Abhijit Shit	abhijit.shit
T12	5003	Aniruddha Seal	a.seal

Tutors & their Emails (Pl. Note the Tutorial Class Venue)

T. Group	T. Venue	Tutor	Email (@iitg.ac.in)
T13	5101	Mandeep Singh	mandeep.singh
T14	5104	Jaspreet Kaur Anand	jaspreet_kaur
T15	5106	Manali Sajjan	smanali
T16	5205	Madhab Mondal	m.mondal
T17	5206	Arka Mukherjee (I Part) Bikramjit Acharjee (II Part)	m.arka b.acharjee

All Backlog Students are instructed to attend the tutorial class in the Tutorial Group T17 in 5206.

Syllabus of MA201

Complex Analysis: Complex numbers and elementary properties; Complex functions - limits, continuity and differentiation, Cauchy-Riemann equations, analytic and harmonic functions, elementary analytic functions, anti-derivatives and line (contour) integrals, Cauchy-Goursat theorem, Cauchy's integral formula, Morera's theorem, Liouville's theorem, Fundamental theorem of algebra and maximum modulus principle; Power series, Taylor series, zeros of analytic functions, singularities and Laurent series, Rouche's theorem and argument principle, residues, Cauchy's Residue theorem and applications, Mobius transformations and applications.

Partial differential equations & Transforms: Fourier series, half-range Fourier series, Fourier transforms, finite sine and cosine transforms; First order partial differential equations, solutions of linear and quasilinear first order PDEs, method of characteristics; Classification of second-order PDEs, canonical form; Initial and boundary value problems involving wave equation and heat conduction equation, boundary value problems involving Laplace equation and solutions by method of separation of variables; Initial-boundary value problems in non-rectangular coordinates.

Laplace and inverse Laplace transforms, properties, convolutions; Solution of ODEs and PDEs by Laplace transform; Solution of PDEs by Fourier transform.

MA201: Texts and References

Text Books:

1. J. W. Brown and R. V. Churchill, Complex Variables and Applications, 7th Edition (Any Edition), Mc-Graw Hill, 2004.
2. K. Sankara Rao, Introduction to Partial Differential Equations, 3rd Edition, Prentice Hall of India, 2011.

Reference Books:

1. J. H. Mathews and R. W. Howell, Complex Analysis for Mathematics and Engineering, 3rd Edition, Narosa,1998.
2. I. N. Sneddon, Elements of Partial Differential Equations, McGraw Hill, 1957.
3. S. J. Farlow, Partial Differential Equations for Scientists and Engineers, Dover Publications, 1993.
4. E. Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley, 2015.

Course Webpage at Moodle

- The course webpage for MA201 Mathematics-III (July-November 2023) is maintained at Moodle site. The course information, notices, tutorial sheets, lecture slides, and everything will be uploaded in this moodle webpage of MA201.
- You are requested to login at https://www.iitg.ac.in/moodle/login/index.php with your IITG Email ID and ERP Password and do enrollment / registration for the course MA201 Mathematics-III (July-November 2023) with the student enrolment key complexpde.
- All students of MA201 should login to Moodle regularly in every week and see the updates of MA201.

Continuous Assessments & Grading Policy

Assessments	**Date & Day**	**Weightage** (% of Marks)
Quiz-1	28-August-2023, Monday	15%
Mid-Semester Exam	18-September-2023, Monday	30%
Quiz-2	30-October-2023, Monday	15%
End-Semester Exam	19-November-2023, Sunday	40%

- Grading of the course will be done based on the total marks scored by the students in ALL the above mentioned Assessments.
- For absentees, NO MAKE UP Test will be conducted for Quiz-1, Quiz-2, and Mid Semester Exam, irrespective of any reasons.

Attendance Policy

- Attendance in all lecture and tutorial classes is compulsory.
- Students, who do not meet 75% attendance requirement will NOT be allowed to write the end semester examination and will be awarded F (Fail) grade in this course. Further such students (getting F due to attendance shortage) are NOT eligible for appearing in the Supplementary Examination of this course.
- For attendance in the tutorial classes, attendance sheets will be circulated.
- Each student is expected to sign against his/her name only in the attendance sheets.
- In case, any student is found marking proxy for some other student, an appropriate disciplinary action will be taken on both students involved in the proxy matter.
- Roll Call Attendance will also be taken randomly.

Lecture Policy

- In the Lecture Classes, Definitions, Theorems, Proofs, Examples, Concepts, etc., are explained using mainly slides.
- The slides will serve as the lecture material and are normally uploaded in the Moodle Course Webpage after the lecture. Please see Lecture Slides Folder regularly.
- In the Lecture Classes, the details or any material worked out on the black board should be noted down by the students.
- The materials worked out on the black board will NOT be available in the slides.

Tutorial Policy

- Tutorial sheets will be uploaded in the moodle webpage of MA201 in the folder Tutorial Sheets. Students are instructed to visit this folder frequently and see & download tutorial sheets.
- All students should work out problems as much as possible from the tutorial sheets before coming to the tutorial classes. The aim of tutorials is to clear doubts of the students by working out important/ difficult problems. Students should note it down the material / answers worked out on the board by the tutors.
- Solutions to the Tutorial Sheets will NOT be uploaded in the course webpage of MA201 or anywhere.