Information of the course on **Linear Algebra, Integral Transforms and Special Functions(MA102)** at IIT Ropar, A.Y.: 2023-2024

- **Course coordinator:** Dr. Tapas Chatterjee
- **Class and tutorial timings:** As per the institute time-table.

Instructors:

- Dr. Tapas Chatterjee (Division - D1)
- Dr. Partha Sharathi Dutta (Division - D4)
- Dr. Santanu Sarkar (Division - D3)
- Dr. Manmohan Vashisth (Division - D2)

Course contents:

- **Linear Algebra:** Vector spaces over R and C, Subspaces, Basis and Dimension, Matrices and determinants, Rank of a matrix, System of linear equations, Gauss elimination method, Linear transformations, Rank-nullity theorem, Change of basis, Eigen values, Eigen vectors, Diagonalization of a linear operator, Inner product spaces. Spectral theorem for real symmetric matrices, application to quadratic forms.
- **Integral Transforms:** Laplace transforms of elementary functions, Inverse Laplace transforms and applications, Fourier series, Fourier transforms, Fourier cosine and sine integrals, Dirichlet integral, Inverse Fourier transforms, Special Functions: Gamma and Beta functions, Error functions.

Credit system for the course:

- 10 marks for first quiz which will be held on February 3, 2024.
- 30 marks for mid-sem exam. Mid-sem exam will be as per institute schedule.
- 10 marks for the second quiz which will be held on April 6, 2024.
- 50 marks for end-sem exam. End-sem exam will be as per institute schedule. End-sem exam will contain the whole syllabus, taught during the course.

Grading and attendance policy:

- As per institute norms.

References for the course:

1. S.H. Friedberg, A.J. Insel and L.E. Spence; Linear Algebra, 4th Edition, Pearson, 2021.
2. S. Axler, Linear Algebra Done Right, 4th edition, Springer, 2023.
3. H. Anton and C. Rorres; Elementary Linear Algebra, 11th Edition, Wiley, 2014.

4. J. L. Schiff; The Laplace Transform: Theory and Applications, Springer, 1999.

5. L. Debnath and D. Bhatta; Integral Transforms and Their Applications, CRC press, 2006.

List of TAs with respective groups:

1. Group 1: Name: Jashoda Kumari, Email id: jashoda.22maz0011@iitrpr.ac.in(Class Room: ME-1 Every Friday).
2. Group 2: Name: Seema, Email id: Seema.22maz0010@iitrpr.ac.in (Class Room: ME-2 Every Friday).
3. Group 3: Name: Karishan Kumar, Email id: krishna.23maz0006@iitrpr.ac.in (Class Room: EE-3 Every Friday).
4. Group 4: Name: Vishal Tiwari, Email id: vishal.21maz0003@iitrpr.ac.in (Class Room: EE-1 Every Friday).
5. Group 5: Name: Ashish Kumar Pandey, Email id: ashish.23maz0003@iitrpr.ac.in (Class Room: M-4 Every Friday).
6. Group 6: Name: Priti Saha, Email id: priti.23maz0005@iitrpr.ac.in (Class Room: CY-1 Every Friday).
7. Group 7: Name: Tanvir Kaur, Email id: tanvir.20maz0001@iitrpr.ac.in (Class Room: ME-1 Every Tuesday).
8. Group 8: Name: Krishna Kumar Lal, Email id: krishna.23maz0006@iitrpr.ac.in (Class Room: EE-1 Every Tuesday).
9. Group 9: Name: Mounesh C, Email id: mounesh.23maz0008@iitrpr.ac.in (Class Room: CS-1 Every Tuesday).
10. Group 10: Name: Manish Kumar, Email id: staff.manish.kumar@iitrpr.ac.in (Class Room: EE-3 Every Tuesday).
11. Group 11: Name: Sarita, Email id: sarita.23maz0004@iitrpr.ac.in (Class Room: M-5 Every Tuesday).
12. Group 10: Name: Bikky Kumar, Email id: bikky.23maz0009@iitrpr.ac.in (Class Room: EE-SH Every Tuesday).