



**RAJIV GANDHI INSTITUTE OF PETROLEUM TECHNOLOGY
JAIS, AMETHI**

(राजीव गांधी पेट्रोलियम प्रौद्योगिकी संस्थान, जायस, अमेठी)

(An Institute of National Importance established under the Act of Parliament)

(संसद के अधिनियम के अंतर्गत स्थापित राष्ट्रीय महत्व का संस्थान)

A Programme

B.Tech. in Mathematics and Computing

Offered by

Department of Mathematical Sciences

From

Academic Session: 2021-22

Framework of the 4-Year B.Tech. Program in
Mathematics and Computing

Semester-wise Course Structure:

Semester 1 (I Year: Odd Sem)

Course/Subject	L	T	P	Cr
Classical Physics (IS) (PY 111)	3	1	0	11
Inorganic and Physical Chemistry (IS) (CY 111)	3	1	0	11
Real Analysis and Calculus (IS) (MA 111)	3	1	0	11
Computer Programming (IE) (CS 101)	3	1	2	13
Biology (IS) (BY 101)	2	1	0	8
Chemistry Lab (IS) (CY 111L)	0	0	2/2	1
Physics Lab (IS) (PY 111L)	0	0	2/2	1
Engineering Graphics (EP) (ME 121)	0	0	3	3
Total Credits				59
Basic English (HU)* (LM 101)	1	2	0	7
Universal Human Values (HU) (HU 101)	1	1	0	5

*For students with less proficiency in English

Semester 2 (I Year: Even Sem)

Course/Subject	L	T	P	Cr
Modern Physics (IS) (PY 112)	2	1	0	8
Differential Equations (IS) (MA 121)	3	1	0	11
Engineering Thermodynamics (IE) (CH 161)	3	1	0	11
Fundamentals of Electronics Engineering (IE) (EC 111)	3	1	2	13
Engineering Practices in Mathematics and Computing (MA 122)	1	0	2	5
Chemistry Lab (IS) (CY 121L)	0	0	2/2	1
Physics Lab (IS) (PY 121L)	0	0	2/2	1
Workshop Practices (EP) (ME 131)	0	0	3	3
Total Credits				53
Community Internship (HU)	0	0	5	5

Semester 3 (II Year: Odd Sem)

Course/Subject	L	T	P	Cr
Linear Algebra & Complex Analysis (IS) (MA 211)	2	1	0	8
Discrete Mathematics (DC/CSE) (CS 201)	3	0	0	9
Data Structure & Algorithms (IE/CSE) (CS 211)	3	0	2	11
Graphics & Visual Computing (DC/CSE) (CS 231)	2	0	2	8
Elementary Number Theory & Algebra (DC) (MA 212)	3	1	0	11
Total Credits				47

Semester 4 (II Year: Even Sem)

Course/Subject	L	T	P	Cr
Database Management Systems (DC/CSE) (CS 212)	3	0	2	11
Computer Organization and Architecture (DC/CSE) (CS 211)	3	0	0	9
Numerical Methods (IS) (MA 221)	2	1	0	8
Statistical Methods and Data Analysis (IS) (MA 231)	2	1	0	8
Web Technology (IE/CSE) (CS 222)	3	0	2	11
Financial Engineering-I (DC) (MA 241)	3	0	0	9
Total Credits				56

Semester 5 (III Year: Odd Sem)

Course/Subject	L	T	P	Cr
Operating Systems (DC/CSE) (CS 311)	3	0	2	11
Computational PDE (DC) (MA 321)	3	0	0	9
Design and Analysis of Algorithms (DC/CSE) (CS 341)	3	0	2	11
DE-1 (DE)	3	0	0	9
Theory of Computation (DC/CSE) (CS 321)	3	0	0	9
B.Tech. Project-I (DP)	0	0	10	10
Total Credits				59
Summer Internship/ Industrial Visit	0	0	5	5

Semester 6 (III Year: Even Sem)

Course/Subject	L	T	P	Cr
Functional Analysis & Topology (DC) (MA 311)	3	0	0	9
Computer Networks (DC/CSE) (CS 351)	3	0	2	11
Optimization Methods & Applications (DC) (MA 323)	3	0	0	9
Stochastic Processes (DC) (MA 331)	3	0	0	9
DE-2 (DE)	3	0	0	9
B.Tech. Project-II (DP)	0	0	10	10
Total Credits				57

Semester 7 (IV Year: Odd Sem)

Course/Subject	L	T	P	Cr
Graph Theory (DC) (MA 411)	3	0	0	9
DE-3 (DE)	3	0	0	9
OE-1 (OE)	3	0	0	9
L/M-1	3	0	0	9
HSS	3	0	0	9
B.Tech. Project-III (DP)	0	0	10	10
Total Credits				55

Semester 8 (IV Year: Even Sem)

Course/Subject	L	T	P	Cr
Soft Computing (DC/CSE) (CS 468)	2	0	2	8
Data Mining (DC/CSE) (CS 458)	2	0	2	8
DE-4 (DE)	3	0	0	9
OE-2 (OE)	3	0	0	9
L/M-2	3	0	0	9
Total Credits				43

Streams in Mathematics and Computing:

	Mathematical Modeling & Simulation	Artificial Intelligence (CSE)	Financial Mathematics
DE-1	Mathematical Modeling of Dynamical System (MA 322)	Artificial Intelligence (CS 360)	Mathematical Finance (MA 341)
DE-2	Computational Fluid Dynamics (MA 324)	Deep Learning (CS 365) or Genetic Algorithm (CS 361)	Financial Engineering-II (MA 342)
DE-3	Data Analytics (CS 457)	Data Analytics (CS 457)	Computational Finance (MA 441)
DE-4	Reservoir Simulation (MA 421)	Computer Vision & Pattern Recognition (CS 454)	Financial Management (MA 454)

Open Electives:

A tentative list of Open Electives (OE) is given below. More elective courses will be included/updated in future.

1. Software Engineering. (CSE, Sem-V)
2. Compiler Design. (CSE, Sem-VI)
3. Mobile Computing (CSE, Sem-VII)
4. Digital Image Processing. (CSE, Sem-VIII)
5. Management Accounting. (MBA, Sem-I)
6. Managerial Economics. (MBA, Sem-I)
7. Business Analytics. (MBA, Sem-II)
8. Financial Derivatives. (MBA, DE)
9. Security Analysis & Portfolio Management. (MBA, DE)
10. Project Finance. (MBA, DE)
11. International Finance. (MBA, DE)
12. Management of Financial Services. (MBA, DE)
13. Financial Risk Management. (MBA, DE)
14. Corporate Finance. (MBA, DE)
15. Modern Coding Theory (EC, DE)
16. Modeling, Simulation and Optimization (CEBE, Sem-VIII)