Mathematics Elective Courses From All Departments

(M): Mandatory
(E): Elective

Elective Courses For The Second Year

- **Mathematics**

1. Math 200 Undergraduate Seminar
2. Math 201 Introduction to Mathematical Programming
3. Math 240 Analytical Mechanics
4. Math 260 Mathematics for Sustainability
5. Math 303 History of Mathematical Concepts 1
6. Math 304 History of Mathematical Concepts 2
7. Math 307 Introduction to Graph Theory
8. Math 334 Introduction to Wavelets and Applications
9. Math 338 Mathematics for Machine Learnings
10. Math 366 Number Theory
11. Math 368 An Introduction to Mathematical Control Theory
12. Math 387 Introduction to Topology and Surfaces
13. Math 405 Variational Analysis
14. Math 432 Analysis of Symmetric Encryption and Hash Functions

- P**HYSICS**

1- Phys 203 Classical Mechanics 1 (M)
2- Phys 204 Classical Mechanics 2 (M)
3- Phys 222 Modern Physics (M)

- **Molecular Biology and Genetics (MBG)**

1- MBG 205 Biostatistics (M)

- **Mechanical Engineering**

1- Econ 205 Principles of Economics (M)

- **Computer Engineering**

1- Ceng 211 Programming Fundamentals (M)
2- Ceng 213 Theory of Computation (M)
3- Ceng 212 Concepts of Programming Languages (M)
4- Ceng 214 Logic Design (M)
5- Ceng 216 Numerical Computation (M)
6- Ceng 218 Analysis and Design of Algorithms (M)

Elective Courses For The Third Year

- **Mathematics**

15.MATH 301 Dynamical Systems
16.MATH 372 Differential Geometry
17.MATH 381 Numerical Analysis
18.MATH 303 History Of Mathematical Concepts I
19.MATH 304 History Of Mathematical Concepts II
20.MATH 307 Introduction to Graph Theory
21.MATH 308 Introduction to Combinatorics
22.MATH 311 Coding theory
23.MATH 312 Computational mathematics and algorithms
24.MATH 313 Introduction to Cryptography
25.MATH 330 Trending Mathematical Algorithms
26.MATH 333 Introduction to Mathematical Modeling
27. Math 334 Introduction to Wavelets and Applications
28. Math 338 Mathematics for Machine Learnings
29.MATH 341 Advanced Mathematics Internship
30.MATH 342 Mathematics Internship
31.MATH 366 Number Theory
32.MATH 368 An Introduction to Mathematical Control Theory

33.MATH 382 Numerical Analysis II
34.MATH 385 Special Functions of Applied Mathematics
35.MATH 386 Fluid Dynamics
36.MATH 338 Mathematics for Machine Learning
37.MATH 387 An Introduction to Topology of Surfaces
38.MATH 389 Introduction to Commutative Ring Theory
39.MATH 334 Introduction to Wavalet and Applications
40.MATH 335 Mathematical Image Deblurring
41. Math 432 Analysis of Symmetric Encryption and Hash Functions

- **PHYSICS**

1- Phys 301 Electromagnetic Theory 1 (M)
2- Phys 302 Electromagnetic Theory 2 (M)
3- Phys 321 Quantum Mechanics 1 (M)
4- Phys 322 Quantum Mechanics 2 (M)
5- Phys 314 Astronomy (E)

- **Computer Engineering**

1. Ceng 311 Computer Architecture (M)
2. Ceng 315 Information Managment (M)
3. Ceng 312 Computer Networks (M)
4. Ceng 316 Software Engineering (M)
5. Ceng 322 Operating Systems (M)
6. Ceng 381 Stochastic Processes (E)
7. Ceng 382 Information Theory (E)
8. Ceng 385 Mathematical Logic (E)
9. Ceng 388 Web Programming (E)
10. Ceng 389 Mobile Application Development (E)
11. Ceng 390 Cloud Computing (E)

Elective Courses For The Fourth Year

Students are allowed to take mathematics courses from the elective list of second and third year, or from the mathematics courses list below, or any suitable course from other departments if their advisors approuve.

42.MATH 401 Quantum Mechanics
43.MATH 403 Combinatorial Design theory
44.MATH 404 Quantum Cumputations and Information
45.MATH 405 Variational Analysis
46.MATH 406 Mathematics of Public Key Cryptography
47.MATH 407 Conformal Mappings
48.MATH 408 Advanced Topics in Graph Theory
49.MATH 409 Advanced Topics in Combinatorics
50.MATH 410 Green's functions
51.MATH 411 Mathematical optimization
52.MATH 412 Hyperbolic geometry
53.MATH 413 Linear and Nonlinear Waves
54.MATH 414 Introduction to Integral Equations
55.MATH 422 Introduction to Abelian Groups
56.MATH 430 Contemporary Applications of Mathematics
57.MATH 432 Analysis of Symmetric Encryption and Hash Functions
58.MATH 440 Knot Theory and Its Applications
59.MATH 441 Introduction to Geometric Topology
60.MATH 442 An Introduction to Topological Data Analysis
61.MATH 443 Introduction to Analytic Number Theory
62.MATH 444 Introduction to Modules and Rings
63.MATH 445 Mathematical Aspects of Blockchain Technologies
64.MATH 446 Curriculum Supporting Course
65.MATH 447 Entrepreneurship Education
66.MATH 450 Scale Invariance and Dimensional Analysis
67.MATH 451 Mathematics and Technology
68.MATH 452 Functional Analysis
69.MATH 453 Introduction to Generalized Functions
70.MATH 455 Control of Infinite Dimensional Systems
71.MATH 456 Galois Theory
72.MATH 481 Differential Equations with Numerical Methods
73.MATH 482 Numerical Solutions of Linear Integral Equations
74.MATH 499 Cooperative Education Course