# ANALYTIC NUMBER THEROY

| 1 | Course Title: | ANALYTIC NUMBER THEROY |
|---|---|---|
| 2 | Course Code: | MAT3052 |
| 3 | Type of Course: | Optional |
| 4 | Level of Course: | First Cycle |
| 5 | Year of Study: | 3 |
| 6 | Semester: | 6 |
| 7 | ECTS Credits Allocated: | 5.00 |
| 8 | Theoretical (hour/week): | 3.00 |
| 9 | Practice (hour/week): | 0.00 |
| 10 | Laboratory (hour/week): | 0 |
| 11 | Prerequisites: | None |
| 12 | Language: | Turkish |
| 13 | Mode of Delivery: | Face to face |
| 14 | Course Coordinator: | Prof. Dr. İSMAİL NACİ CANGÜL |
| 15 | Course Lecturers: | Doç. Dr. Ahmet TEKCAN, Yrd. Doç. Dr. Musa DEMİRCİ, Yrd. Doç. Dr. Hacer ÖZDEN |
| 16 | Contact information of the Course Coordinator: | cangul@uludag.edu.tr, 0224 2941756, Fen-Edebiyat Fakültesi, Matematik Bölümü, 16059, Görükle / Bursa |
| 17 | Website: | http://www.ismailnacicangul.com/ |
| 18 | Objective of the Course: | To obtain results concerning the distribution of prime numbers and to make an introduction to analytic numbers |
| 19 | Contribution of the Course to Professional Development: | |
| 20 | Learning Outcomes: | |
| | 1 | Can define prime numbers and state the known results on their distribution |
| | 2 | Can establish relations between aritmetic functions |
| | 3 | Can apply the theorems on the distribution of prime numbers |
| | 4 | |
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| 21 | Course Content: | |
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| | **Course Content:** | |
| Week | Theoretical | Practice |
| 1 | Prime number theorem | |
| 2 | Results of the prime number theorem | |
| 3 | The analytic proof of prime number theorem | |
| 4 | Fundamental theorem of arithmetic | |

| 5 | Arithmetic functions | |
|---|---|---|
| 6 | Dirichlet Product of Arithmetic functions | |
| 7 | Mobious inversion Formula | |
| 8 | Applications of Mobious inversion Formula | |
| 9 | Relations between aritmetic functions | |
| 10 | Primitive roots | |
| 11 | Quadratic reciprocity law | |
| 12 | Legendre symbol | |
| 13 | Quadratic congruences | |
| 14 | Riemann-Zeta function | |

| 22 | Textbooks, References and/or Other Materials: | 1. Tom M. Apostol, Introduction to Analytic Number Theory, Springer, 2000<br>2. Kiran Sridhara Kedlaya, Analytic Number Theory, (Ders notları) MIT, 2006<br>3. Paul T. Bateman and Harold G. Diamond, Analytic Number Theory an Introductory Course, world Scientific, 2009 |
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| 23 | Assesment |
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| TERM LEARNING ACTIVITIES | NUMBER | WEIGHT |
|---|---|---|

| Activites | | Number | Duration (hour) | Total Work Load (hour) |
|---|---|---|---|---|
| Theoretical | Home work-project 2 | 50,00 14 | 3.00 | 42.00 |
| Practicals/Labs | Final F 1 | 0 | 0.00 | 0.00 |
| Self study and preperation | Total 3 | 100,00 14 | 4.00 | 56.00 |
| Homeworks | | 2 | 20.00 | 40.00 |
| Projects | Contribution of Final Exam to Success Grade 50,00 | 0 | 0.00 | 0.00 |
| Field Studies | | 0 | 0.00 | 0.00 |
| Midterm exams | Total 100,00 | 0 | 0.00 | 0.00 |
| Others | | 0 | 0.00 | 0.00 |
| Final Exams | | 1 | 15.00 | 15.00 |

| 24 | ECTS / WORK LOAD TABLE | | |
|---|---|---|---|
| Total Work Load | | | 153.00 |
| Total work load/ 30 hr | | | 5.10 |
| ECTS Credit of the Course | | | 5.00 |

| 25 | CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS |
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| | PQ1 | PQ2 | PQ3 | PQ4 | PQ5 | PQ6 | PQ7 | PQ8 | PQ9 | PQ10 | PQ11 | PQ12 | PQ13 | PQ14 | PQ15 | PQ16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ÖK1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ÖK2 | 0 | 4 | 0 | 0 | 5 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ÖK3 | 0 | 4 | 0 | 0 | 5 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**LO: Learning Objectives    PQ: Program Qualifications**

| Contribution Level: | 1 very low | 2 low | 3 Medium | 4 High | 5 Very High |
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| | | | | | |

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