EK: 2/7

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| **logosbULUDAĞ UNIVERSITY****GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES****2017-2018 ACADEMIC YEAR COURSE PLAN** |
| **DEPARTMENT OF** |  DEPARTMENT OF CHEMISTRY  |
| **DEPARTMENT / PROGRAM** |  CHEMISTRY/UNIFIED DOCTORAL PROGRAM |
| **COURSE STAGE** | **I. TERM / FALL** | **II. TERM / SPRING** |
| **Code** | **Course Title** | **Type** | **T** | **U** | **L** | **Credit** | **ECTS** | **Code** | **Course Title** | **Type** | **T** | **U** | **L** | **Credit** | **ECTS** |
| CHEM5001 | SPECTROSCOPIC METHODS IN ANALYTICAL CHEMISTRY | Z | 3 | 0 | 0 | 3 | 6 | CHEM5002 | PHYSICAL CHEMISTRY OF ATOM AND MOLECULAR SYSTEMS | Z | 3 | 0 | 0 | 3 | 6 |
| CHEM5003 | ADVANCED INORGANIC CHEMISTRY | Z | 3 | 0 | 0 | 3 | 6 | CHEM5004 | ADVANCED ORGANIC CHEMISTRY | Z | 3 | 0 | 0 | 3 | 6 |
| CHEM5025 | ADVANCED BIOCHEMISTRY | Z | 3 | 0 | 0 | 3 | 6 | CHEM 6192 | PHD THESIS II | Z | 0 | 1 | 0 | 0 | 1 |
| CHEM 6191 | PHD THESIS I | Z | 0 | 1 | 0 | 0 | 1 | CHEM6182 | ADVANCED TOPİCS IN PHD THESIS II | S | 4 | 0 | 0 | 0 | 5 |
| CHEM6181 | ADVANCED TOPICS IN PHD THESIS I | S | 4 | 0 | 0 | 0 | 5 | CHEM5006 | CHROMATOGRAPHIC METHODSIN ANALYTICAL CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 |
| CHEM5005 | ADVANCEDANALYTICAL CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 | CHEM5008 | MASS SPECTROMETRIC METHODS | S | 3 | 0 | 0 | 3 | 6 |
| CHEM5007 | SAMPLE PREPARATIONMETHODSIN ANALYTICAL CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 | CHEM5010 | INTRODUCTION TO ATOMIC SPECTROSCOPY | S | 3 | 0 | 0 | 3 | 6 |
| CHEM5009 | INTRODUCTION TOCHEMOMETRICS | S | 3 | 0 | 0 | 3 | 6 | CHEM5012 | NUCLEARANALYTICALTECHNIQUES | S | 3 | 0 | 0 | 3 | 6 |
| CHEM5011 | POTENTIOMETRY IN ANALYTICAL CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 | CHEM5014 | SELECTED TOPICS INCOORDINATION CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 |
| CHEM5013 | SPECTROSCOPIC METHODS IN INORGANIC CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 | CHEM5016 | CYCLICVOLTAMMETRY | S | 3 | 0 | 0 | 3 | 6 |
| CHEM5015 | THERMALANALYSIS METHODS | S | 3 | 0 | 0 | 3 | 6 | CHEM5018 | RESEARCH METHODSIN INORGANIC CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 |
| CHEM5017 | INDUSTRIAL INORGANIC CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 | CHEM5020 | CHEMISTRY OF COORDINATION COMPOUNDS IN SOLUTIONS | S | 3 | 0 | 0 | 3 | 6 |
| CHEM5019 | ACIDS, BASES AND SOLVENTS | S | 3 | 0 | 0 | 3 | 6 | CHEM5022 | CHEMISTRY OFELEMENTS | S | 3 | 0 | 0 | 3 | 6 |
| CHEM5021 | SMART POLYMERS | S | 3 | 0 | 0 | 3 | 6 | CHEM5024 | OXIDATIONANDREDUCTIONREACTIONSIN INORGANIC CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 |
| CHEM5023 |  POROUS MATERIALS | S | 3 | 0 | 0 | 3 | 6 | CHEM5026 | ADVANCED ANALYSIS TECHNIQUES OF BIOMOLECULES | S | 3 | 0 | 0 | 3 | 6 |
| CHEM5027 | PHYSIOCHEMICAL TREATMENTTECHNIQUESWASTEWATER | S | 3 | 0 | 0 | 3 | 6 | CHEM5028 | ELECTRONIC TEORIES IN ORGANIC CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 |
| CHEM5029 | SEPERATION AND PURIFICATION TECHNIQUES IN ORGANIC CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 | CHEM5030 | ION-EXCHANGERS AND THEIR PHYSICAL CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 |
| CHEM5031 | SEPARATION METHODS INANALYTICAL CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 | CHEM5032 | SYNTHETIC SPECIALTY POLYMERS | S | 3 | 0 | 0 | 3 | 6 |
| CHEM5033 | ADSORPTION METHODSIN ANALYTICAL CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 | CHEM5034 | HETEROGENEOUS CATALYSIS | S | 3 | 0 | 0 | 3 | 6 |
| CHEM5035 | ANALYSIS METHODS FOR WEAK ENERGY BONDS | S | 3 | 0 | 0 | 3 | 6 | CHEM5036 | INTRODUCTION TO NANOTECHNOLOGY | S | 3 | 0 | 0 | 3 | 6 |
| CHEM5037 | MOLECULAR IMPRINTED POLYMERS AND NANOBIOTECHNOLOGICAL APPLICATIONS | S | 3 | 0 | 0 | 3 | 6 | CHEM5038 | ORGANIC REACTIONS KNOWN WITH SPECIAL NAMES | S | 3 | 0 | 0 | 3 | 6 |
| CHEM5039 | GREEN ORGANIC SYNTHESIS REACTIONS | S | 3 | 0 | 0 | 3 | 6 | CHEM5040 | ELECTROANALYTICAL CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 |
| CHEM5041 | DNA,RNA and PROTEIN SYNTHESIS METABOLISM | S | 3 | 0 | 0 | 3 | 6 | CHEM5042 | TRANSPORT and BIOSIGNALING in BIOLOGICAL MEMBRANES | S | 3 | 0 | 0 | 3 | 6 |
|  |  |  |  |  |  |  |  | CHEM5044 | BIOSYNTHESIS | S | 3 | 0 | 0 | 3 | 6 |
|  |  |  |  |  |  |  |  | CHEM5046 | HORMONAL REGULATION of METABOLISM | S | 3 | 0 | 0 | 3 | 6 |
| **Total Credits** | **12** | **30** | **Total Credits** | **12** | **30** |
| **STAGE THESIS** | **III. TERM / FALL** | **IV. TERM / SPRING** |
| CHEM6193 | PHD THESIS III | Z | 0 | 1 | 0 | 0 | 1 | CHEM6194 | PHD THESIS IV  | Z | 0 | 1 | 0 | 0 | 1 |
|  |  |  |  |  |  |  |  | CHEM6172 | SEMINAR  | Z | 0 | 2 | 0 | 0 | 4 |
|  |  |  |  |  |  |  |  | FEN6000 | RESEARCH TECHNIQUES and PUBLICATION ETHICS | Z | 2 | 0 | 0 | 2 | 2 |
| CHEM6183 | ADVANCED TOPICS IN PHD THESIS III | S | 4 | 0 | 0 | 0 | 5 | CHEM6184 | ADVANCED TOPICS IN PHD THESIS IV | S | 4 | 0 | 0 | 0 | 5 |
| CHEM6003 | PRACTICES OF GROUP THEORY IN MOLECULAR SPECTROSCOPY | S | 3 | 0 | 0 | 3 | 6 | CHEM6002 | FACTOR ANALYSISIN CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6005 | DESIGN OF MOLECULE IN ORGANIC | S | 3 | 0 | 0 | 3 | 6 | CHEM6004 | MICROMETHODSIN ANALYTICAL CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6007 | LIQUID CHROMATOGRAPHY | S | 3 | 0 | 0 | 3 | 6 | CHEM6006 | COUPLED METHODS IN CHROMATOGRAPHY  | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6009 | ACTIVATED CARBON ADSORPTION AND APPLICATIONS | S | 3 | 0 | 0 | 3 | 6 | CHEM6008 | CHEMOMETRIC METHODS | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6011 | ANALYTICAL TECHNIQUES IN VOLTAMMETRY | S | 3 | 0 | 0 | 3 | 6 | CHEM6010 | BIOANALYTICAL CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6013 | ANALYTICAL CHEMISTRY OF COMPLEX MATRICES | S | 3 | 0 | 0 | 3 | 6 | CHEM6012 | ASYMMETRIC SYNTHESIS IN ORGANIC CHEMİSTRY | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6015 | ATOMIC SPECTROSCOPIC METHODS | S | 3 | 0 | 0 | 3 | 6 | CHEM6014 | NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY IN ORGANIC STRUCTURE IDENTIFICATION | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6017 | MECHANISMS OF MOLECULAR REARRANGEMENTS I | S | 3 | 0 | 0 | 3 | 6 | CHEM6016 | INTERFACESCIENCE II | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6019 | PRINCIPLES OF ORGANIC SYNTHESIS I | S | 3 | 0 | 0 | 3 | 6 | CHEM6018 | SOLID STATE CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6021 | CATALYSIS | S | 3 | 0 | 0 | 3 | 6 | CHEM6020 | ELECTROCHEMICALSENSORS | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6023 | CRYSTAL CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 | CHEM6022 | ADVANCED MATERIAL CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6025 | NATURAL ANTIOXIDANTS | S | 3 | 0 | 0 | 3 | 6 | CHEM6024 | ADVANCEDBIOINORGANIC CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6027 | MOLECULAR SYMMETRYAND APPLICATIONS | S | 3 | 0 | 0 | 3 | 6 | CHEM6026 | REACTION MECHANISMSIN INORGANIC | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6029 | BORON CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 | CHEM6028 | MOLECULAR RECOGNITION AND BIOMOLECULE COMPLEXES | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6031 | ADVANCED ORGANOMETALIC CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 | CHEM6030 | FRACTIONATION AND SPECIATION METHODS IN FOOD SAMPLES | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6035 | ION-EXCHANGERS AND THEIR APPLICATIONS | S | 3 | 0 | 0 | 3 | 6 | CHEM6032 | INORGANIC POLYMERS | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6037 | PROTEIN PURIFICATION AND CHARACTERIZATION | S | 3 | 0 | 0 | 3 | 6 | CHEM 6034 | X-RAY CRYSTALLOGRAPHY | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6039 | INTERFACESCIENCE I | S | 3 | 0 | 0 | 3 | 6 | CHEM6036 | POLYMER KINETIC THEORIES | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6041 | ADVANCEDPOLYMER SCIENCEAND TECHNOLOGYI | S | 3 | 0 | 0 | 3 | 6 | CHEM6038 | ADVANCEDPOLYMER SCIENCEAND TECHNOLOGY II | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6043 | OXIDATION MECHANISMS IN ORGANIC CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 | CHEM6040 | MACROMOLECULAR CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6045 | QUALITY CONTROL IN ANALYTICAL CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 | CHEM6042 | STRUCTURE IDENTIFICATION IN ORGANIC CHEMISTRY | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6047 | ADVANCED COORDINATION CHEMISTRY  | S | 3 | 0 | 0 | 3 | 6 | CHEM6044 | MECHANISMS OF MOLECULAR REARRANGEMENTS II | S | 3 | 0 | 0 | 3 | 6 |
| CHEM6049 | OPTICAL AND CHEMICAL SENSORS | S | 3 | 0 | 0 | 3 | 6 | CHEM6046 | PRINCIPLES OF ORGANIC SYNTHESIS II | S | 3 | 0 | 0 | 3 | 6 |
|  |  |  |  |  |  |  |  | CHEM6048 | CORROSION AND ITS ELECTROCHEMICAL BASICS | S | 3 | 0 | 0 | 3 | 6 |
|  |  |  |  |  |  |  |  | KIM6050 | OLED TECHNOLOGY | S | 3 | 0 | 0 | 3 | 6 |
| **Total Credits** | **14** | **30** | **Total Credits** | **12** | **30** |
| **STAGE THESIS** | **V. TERM / FALL** | **VI. TERM / SPRING** |
| CHEM6185 | ADVANCED TOPICS IN PHD THESIS V | Z | 4 | 0 | 0 | 0 | 5 | CHEM6186 | ADVANCED TOPICS IN PHD THESIS VI | Z | 4 | 0 | 0 | 0 | 5 |
| CHEM6195 | PHD THESIS V  | Z | 0 | 1 | 0 | 0 | 15 | CHEM6196 | PHD THESIS VI | Z | 0 | 1 | 0 | 0 | 25 |
| CHEM 6177 | PHD PROFICIENCY EXAMINATION | Z | 0 | 0 | 0 | 0 | 10 |  |  |  |  |  |  |  |  |
|  | **Total Credits** | **0** | **30** |  | **Total Credits** | **0** | **30** |
| **VII. TERM / FALL** | **VIII. TERM / SPRING** |
| CHEM6187 | ADVANCED TOPICS IN PHD THESIS VII | Z | 4 | 0 | 0 | 0 | 5 | CHEM6188 | ADVANCED TOPICS IN PHD THESIS VIII | Z | 4 | 0 | 0 | 0 | 5 |
| CHEM6197 | PHD THESIS VII | Z | 0 | 0 | 0 | 0 | 25 | CHEM6198 | PHD THESIS VIII | Z | 0 | 0 | 0 | 0 | 25 |
|  | **Total Credits** | **0** | **30** |  | **Total Credits** | **0** | **30** |
| **IX. TERM / FALL** | **X. TERM / FALL** |
| CHEM6189 | ADVANCED TOPICS IN PHD THESIS IX | Z | 4 | 0 | 0 | 0 | 5 | CHEM6190 | ADVANCED TOPICS IN PHD THESIS X | Z | 4 | 0 | 0 | 0 | 5 |
| CHEM6199 | PHD THESIS IX | Z | 0 | 0 | 0 | 0 | 25 | CHEM6200 | PHD THESIS X | Z | 0 | 0 | 0 | 0 | 25 |
|  | **Total Credits** | **0** | **30** |  | **Total Credits** | **0** | **30** |
|  | **TOTAL CREDITS: 47 - TOTAL ECTS: 260** |