

# **BS SCHEME OF STUDIES MATHEMATICS**

**DEPARTMENT OF MATHEMATICS**

**GCWUF**

**2020**

# Govt. College Women University Faisalabad

## Department of Mathematics

### Scheme of Studies BS Mathematics Four Years Degree Program 2020

#### Semester I

| Course Code         | Title of the Course                              | Credit Hours    |
|---------------------|--|-----------------|
| <b>Major Course</b> |  |                 |
| MTH-301             | Calculus I                                       | 4(4-0)          |
| MTH-303             | Elements of Set Theory and Mathematical Logic    | 3(3-0)          |
| <b>Minor Course</b> |  |                 |
| ENG-321             | English-I :-Functional English /Freshman English | 3(3-0)          |
| ICT-321             | Introduction to Computer                         | 3(2-1)          |
| PST-321             | Pakistan Studies                                 | 2(2-0)          |
| PHY-301             | Mechanics I                                      | 3(3-0)          |
| <b>Total</b>        |  | <b>18(17-1)</b> |

#### Semester II

| Course Code         | Title of the Course                                       | Credit Hours    |
|---------------------|---|-----------------|
| <b>Major Course</b> |   |                 |
| MTH-302             | Calculus II   | 4(4-0)          |
| MTH-304             | Discrete Mathematics                                      | 3(3-0)          |
| <b>Minor Course</b> |   |                 |
| ENG-322             | English II (Communication Skills /Business Communication) | 3(3-0)          |
| ICT-323             | Introduction to Programming                               | 3(2-1)          |
| ISL-408             | Islamic Studies   | 2(2-0)          |
| PHY-302             | Mechanics II  | 3(3-0)          |
| <b>Total</b>        |   | <b>18(17-1)</b> |

#### Semester III

| Course Code         | Title of the Course                | Credit Hours |
|---------------------|------------------------------------|--------------|
| <b>Major Course</b> |                                    |              |
| MTH-401             | Calculus III                       | 4(4-0)       |
| MTH-403             | Ordinary Differential Equations    | 3(3-0)       |
|                     |                                    |              |
| ECO-301             | Principles of Micro Economics      | 3(3-0)       |
| STA-320             | Introduction to Statistical Theory | 3(3-0)       |

|              |  |                 |
|--------------|--|-----------------|
| ENG-421      | English III (Technical Writing/Business Writing) | 3(3-0)          |
| <b>Total</b> |  | <b>16(16-0)</b> |

#### Semester IV

| Course Code         | Title of the Course           | Credit Hours    |
|---------------------|-------------------------------|-----------------|
| <b>Major Course</b> |                               |                 |
| MTH-402             | Affine and Euclidean Geometry | 3(3-0)          |
| MTH-404             | Linear Algebra                | 3(3-0)          |
| <b>Minor Course</b> |                               |                 |
| PSY-301             | Introduction to Psychology    | 3(3-0)          |
| ARB-308             | Arabic Language I             | 3(3-0)          |
| CHM-300             | Environmental Sciences        | 1(1-0)          |
| <b>Total</b>        |                               | <b>13(13-0)</b> |

#### Semester V

| Course Code         | Title of the Course        | Credit Hours    |
|---------------------|----------------------------|-----------------|
| <b>Major Course</b> |                            |                 |
| MTH-501             | Topology                   | 3(3-0)          |
| MTH-503             | Differential Geometry      | 3(3-0)          |
| MTH-505             | Real Analysis I            | 3(3-0)          |
| MTH-507             | Algebra I                  | 3(3-0)          |
| MTH-509             | Vector and Tensor Analysis | 3(3-0)          |
| MTH-511             | Complex Analysis I         | 3(3-0)          |
| <b>Total</b>        |                            | <b>18(18-0)</b> |

#### Semester VI

| Course Code         | Title of the Course            | Credit Hours    |
|---------------------|--------------------------------|-----------------|
| <b>Major Course</b> |                                |                 |
| MTH-502             | Partial Differential Equations | 3(3-0)          |
| MTH-504             | Classical Mechanics            | 3(3-0)          |
| MTH-506             | Complex Analysis II            | 3(3-0)          |
| MTH-508             | Real Analysis II               | 3(3-0)          |
| MTH-510             | Functional Analysis            | 3(3-0)          |
| MTH-512             | Algebra II                     | 3(3-0)          |
| <b>Total</b>        |                                | <b>18(18-0)</b> |

**Semester VII**

| <b>Course Code</b>                                   | <b>Title of the Course</b>      | <b>Credit Hours</b> |
|--|---------------------------------|---------------------|
| <b>Major Course</b>                                  |                                 |                     |
| MTH-601  | Numerical Analysis I            | 3(3-0)              |
| MTH-603  | Number Theory                   | 3(3-0)              |
| MTH-605  | Mathematical Statistics I       | 3(3-0)              |
| MTH-629  | Seminar                         | 1(0-1)              |
| <b>Elective Courses (2 courses out of following)</b> |                                 |                     |
| MTH-607  | Advanced Group Theory           | 3(3-0)              |
| MTH-609  | Methods of Mathematical Physics | 3(3-0)              |
| MTH-611  | Quantum Mechanics I             | 3(3-0)              |
| MTH-613  | Fluid Mechanics I               | 3(3-0)              |
| MTH-615  | Advanced Topology               | 3(3-0)              |
| MTH-617  | Algebraic Topology              | 3(3-0)              |
| MTH-619  | Continuous Groups               | 3(3-0)              |
| MTH-621  | Rings and Modules               | 3(3-0)              |
| MTH-623  | Special Theory of Relativity    | 3(3-0)              |
| MTH-625  | Operations Research             | 3(3-0)              |
| MTH-627  | Software Packages               | 3(2-1)              |
| <b>Total</b>   |                                 | <b>16(15-1)</b>     |

**Semester VIII**

| <b>Course Code</b>   | <b>Title of the Course</b> | <b>Credit Hours</b> |
|--|----------------------------|---------------------|
| <b>Major Course</b>  |                            |                     |
| MTH-602  | Mathematical Statistics II | 3(3-0)              |
| MTH-604  | Advanced Set Theory        | 3(3-0)              |
| MTH-606  | Numerical Analysis II      | 3(3-0)              |
| MTH-630  | Special Problem            | 1(0-1)              |
| Elective Courses (3 Courses or 1 Course and (Project/ Thesis/Internship)) from the following |                            |                     |
| MTH-608  | Theory of Modules          | 3(3-0)              |
| MTH-610  | Algebraic Number Theory    | 3(3-0)              |
| MTH-612  | Category Theory            | 3(3-0)              |
| MTH-614  | Galois Theory              | 3(3-0)              |
| MTH-616  | Probability Theory         | 3(3-0)              |
| MTH-618  | Theory of Elasticity       | 3(3-0)              |
| MTH-620  | Electromagnetism           | 3(3-0)              |
| MTH-622  | Quantum Mechanics II       | 3(3-0)              |
| MTH-624  | Theory of Optimization     | 3(3-0)              |
| MTH-626  | Measure Theory             | 3(3-0)              |
| MTH-628  | Combinatorics              | 3(3-0)              |
| MTH-634  | Fluid Mechanics II         | 3(3-0)              |
| MTH-636  | Integral Equations         | 3(3-0)              |

|              |              |                 |
|--------------|--------------|-----------------|
| MTH-638      | Graph Theory | 3(3-0)          |
| MTH-631      | Project      | 6(0-6)          |
| MTH-632      | Internship   | 6(0-6)          |
| MTH-633      | Thesis       | 6(0-6)          |
| <b>Total</b> |              | <b>19(18-1)</b> |

| <b>Program</b>       | <b>Award</b>   | <b>Duration</b> | <b>Semester</b> | <b>Credit Hours</b> |
|----------------------|----------------|-----------------|-----------------|---------------------|
| Bachelor of Sciences | BS Mathematics | 4Years          | 8 Semesters     | 136                 |