ORAL ROBERTS UNIVERSITY

DEGREE: **Bachelor of Science**

MAJOR: **Mathematical Physics (MPH)**

# DEGREE PLAN SHEET 2015-2016

## Mathematical Physics Major

**Computing and Mathematics Department**

| | |
|---|---|
| TOTAL HOURS REQUIRED | 128 |
| Hours in general education | 55 |
| Hours in major | 44 |
| Hours in cognate | 6 |
| Hours in minor | 18 |
| Hours in electives | 5 |

Name _____

ID _____ Date _____

Telephone _____ Email _____

Advisor _____ Minor _____

| SEMESTER TAKEN | COURSE CODE | | COURSE TITLE | CREDIT HOURS |
|---|---|---|---|---|
| | | | **FRESHMAN Semester 1** | |
| | COMP | 102 | Composition I | 3 |
| | HUM | 103 | Christian Worldview & Culture | 3 |
| | MAT | 201 | Calculus I | 4 |
| | CSC | 111 | Introduction to Computing | 3 |
| | THE | 103 | Spirit-Empowered Living | 3 |
| | GEN | 099 | Whole Person Assessment | 0 |
| | PRFH | 070 | Swimming Proficiency | 0 |
| | HPE | 001 | Health Fitness I | 1 |
| | | | | 17 |

| SEMESTER TAKEN | COURSE CODE | | COURSE TITLE | CREDIT HOURS |
|---|---|---|---|---|
| | | | **FRESHMAN Semester 2** | |
| | PHY | 111 | Physics I (Lecture & Lab) | 4 |
| | HUM | | Humanities Options[5] | 3 |
| | MAT | 202 | Calculus II | 4 |
| | CSC | 206 | Intermediate Programming | 3 |
| | | | Social Sciences Elective[2] | 3 |
| | HPE | 002 | Health Fitness II | 1 |
| | | | | 18 |

[2]Choice of one of the following: PSY 201, MUS 208, SWK 202, SOC 101, SOC 201, SOC 323, BUS 201, or FIN 244

| SEMESTER TAKEN | COURSE CODE | | COURSE TITLE | CREDIT HOURS |
|---|---|---|---|---|
| | | | **SOPHOMORE Semester 3** | |
| | HUM | | Humanities Options[5] | 3 |
| | HIS | 101 | American History | 3 |
| | MAT | 207 | Discrete Mathematics (Gen Ed) | 3 |
| | PHY | 112 | Physics II (Lecture & Lab) | 4 |
| | BLIT | 110 | Survey of Old Testament Literature | 3 |
| | HPE | 026 | Beginning Swimming[3] **OR** | 0.5 |
| | HPE | | ^ HPE Activity | |
| | | | | 16.5 |

[3]If swimming proficiency (PRFH 070) NOT yet passed.

| SEMESTER TAKEN | COURSE CODE | | COURSE TITLE | CREDIT HOURS |
|---|---|---|---|---|
| | | | **SOPHOMORE Semester 4** | |
| | COM | 101 | Oral Communication | 3 |
| | HUM | | Humanities Options[5] | 3 |
| | PHY | 211 | Modern Physics (Lecture & Lab) | 4 |
| | MAT | 211 | Differential Equations | 3 |
| | BLIT | 120 | Survey of New Testament Literature | 3 |
| | HPE | | ^ HPE Activity | 0.5 |
| | | | | 16.5 |

[5]See list of Humanities (HUM) options on the back.

| SEMESTER TAKEN | COURSE CODE | | COURSE TITLE | CREDIT HOURS |
|---|---|---|---|---|
| | | | **JUNIOR Semester 5** | |
| | MAT | 321 | Calculus III | 4 |
| | PHY | 321 | Electromagnetic Theory | 3 |
| | PHY | 455 | Mathematical Methods in Physics | 3 |
| | | | Minor | 3 |
| | | | Elective | 3 |
| | HPE | | ^ HPE Activity | 0.5 |
| | | | | 16.5 |

| SEMESTER TAKEN | COURSE CODE | | COURSE TITLE | CREDIT HOURS |
|---|---|---|---|---|
| | | | **JUNIOR Semester 6** | |
| | COMP | 303 | Critical Reading & Writing | 3 |
| | GOV | 101 | American Government | 3 |
| | | | Minor | 3 |
| | MAT | | Mathematics Elective | 3 |
| | MAT | 312 | Linear and Matrix Algebra | 3 |
| | MAT | 498 | Senior Paper/Project Preparation | 1 |
| | HPE | | ^ HPE Activity | 0.5 |
| | | | | 16.5 |

| SEMESTER TAKEN | COURSE CODE | | COURSE TITLE | CREDIT HOURS |
|---|---|---|---|---|
| | | | **SENIOR Semester 7** | |
| | | | Minor | 3 |
| | | | Minor | 3 |
| | | | Elective | 2 |
| | PHY | 401 | Optics[1] | 3 |
| | MAT | 499 | Senior Paper/Project | 2 |
| | HPE | | ^ HPE Activity | 0.5 |
| | | | | 13.5 |

| SEMESTER TAKEN | COURSE CODE | | COURSE TITLE | CREDIT HOURS |
|---|---|---|---|---|
| | | | **SENIOR Semester 8** | |
| | | | Minor | 3 |
| | | | Minor | 3 |
| | MAT | | Mathematics Elective | 3 |
| | PHY | 341 | Advanced Physics Lab | 1 |
| | PHY | 402 | Quantum Mechanics | 3 |
| | HPE | | ^ HPE Activity | 0.5 |
| | | | | 13.5 |

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[1]This class may be substituted with PHY 450 (Special Topics in Physics)

Courses above calculus are offered according to the following schedule (S - Spring, F - Fall, * Even years only, ** Odd years only):

Differential Equations (MAT 211)[S]

Linear and Matrix Algebra (MAT 312)[S]

College Geometry (MAT 313)[F]**

Elementary Number Theory (MAT 318)[F]*

Probability and Statistics (MAT 325)F

Discrete Mathematics (MAT 207)[F]

Senior Paper/Project Prep. (MAT 498)[S]

Higher Algebra (MAT 401)[S]*

Advanced Calculus I (MAT 421)[S]**

Senior Paper/Project (MAT 499)[F]

^ Each HPE course is 1 credit hour, but students can petition to take it for .5 credits. Course work remains the same.

**2015-2016**
**B.S. in Mathematical Physics (MPH)**

| **General Education** | **Credit Hours** | **Semester to be taken** |
|---|---|---|
| Whole Person Assessment (GEN 099) | 0 | 1 |
| English (COMP 102, 303) | 6 | 1,6 |
| Oral Communication (COM 101) | 3 | 2,4 |
| [5]Humanities (HUM 103 plus three of the following: HUM 222*, 233*, 244*, 333*, 250, 255, 260, 270, COMP 101^, MAT 315) | 12 | 1, 2, 3, 4 |
| *At least one course must be chosen from courses marked with asterisks. ^Can count for humanities for students who have not yet taken COMP 102. | | |
| Discrete Mathematics (MAT 207) | 3 | 5 |
| Bible Literature (BLIT 110, 120) | 6 | 1,3,4 |
| Theology (THE 103) | 3 | 1,3,4 |
| Laboratory Science | 8 | |
| PHY 111, 112 (lecture & lab)[4] | | 2, 3 |
| American History (HIS 101) | 3 | 3 |
| American Government (GOV 101) | 3 | 4 |
| Social Sciences (Choice of one of the following: PSY 201, MUS 208, SWK 202, SOC 101, SOC 201, SOC 323, BUS 201, or FIN 244) | 3 | 2 |
| Health, Physical Education and Recreation (one course per full-time semester at ORU, including HPE 001 and 002, swimming course or proficiency, and electives) | 5 | Each |
| [4]A grade of C or better is required for these classes | | |
| **General Education Total** | **55** | |
| **Major** | | |
| Modern Physics (PHY 211) - Lecture and Lab | 4 | 4 |
| Electromagnetic Theory (PHY 321) | 3 | 5 |
| Optics[1] (PHY 401) | 3 | 7 |
| Mathematical Methods in Physics (PHY 455) | 3 | 5 |
| Advanced Physics Lab (PHY 341) | 1 | 9 |
| Quantum Mechanics (PHY 402) | 3 | 9 |
| Calculus I (MAT 201) | 4 | 1 |
| Calculus II (MAT 202) | 4 | 2 |
| Differential Equations (MAT 211) | 3 | 4 |
| Linear and Matrix Algebra (MAT 312) | 3 | 6 |
| Calculus III (MAT 321) | 4 | 5 |
| Math Electives - Choice of two of the three following courses: | 6 | |
| Probability and Statistics (MAT 325) | | 6 or 8 |
| Higher Algebra (MAT 401) | | 6 or 8 |
| Advanced Calculus (MAT 421) | | 6 or 8 |
| Senior Paper/Project Preparation (MAT 498) | 1 | 6 |
| Senior Paper/Project (MAT 499) | 2 | 7 |
| [1]This class may be substituted with PHY 450 (Special Topics in Physics) | | |
| **Major Total** | **44** | |
| **Cognate** | | |
| Intermediate Programming (CSC 206) | 3 | 1 |
| Data Structures (CSC 255) | 3 | 2 |
| **Cognate Total** | **6** | |
| **Minor** | **18** | 5, 6, 7, 8 |
| **Electives** | **5** | 5, 6, 7, 8 |
| **Degree Total** | **128** | |

**Each HPE course is 1 credit hour, but students can petition to take it for .5 credits. Course work remains the same.