## **BS PHYSICS**

| NAME          |  |
|---------------|--|
| STUDENT ID    |  |
| CONCENTRATION |  |
| MINOR         |  |

| Major GPA at least 2.00                     | [ ] YES [ ] NO |
|---|----------------|
| US Cultural Pluralism Met++                 | [ ] YES [ ] NO |
| 60 Units Upper Division Met Taken/Remaining | [ ] YES [ ] NO |
| GWR Met                                     | [ ] YES [ ] NO |
| Upper Div GE Met Taken/Remaining            | [ ] YES [ ] NO |
| Free Electives Met                          | [ ] YES [ ] NO |

2007-2009 updated 07/12/07 Units Required 180

| DEGREE DATE       | Earned<br>Hours | Quality<br>Hours                        | Quality<br>Points | GPA |
|-------------------|-----------------|---|-------------------|-----|
| Transfer          |                 |   |                   |     |
| Cal Poly          |                 |   |                   |     |
| Transcript Totals |                 |   |                   |     |
|                   |                 | <= Units that are NOT Degree Applicable |                   |     |
|                   |                 | <= Degree Applicable Units              |                   |     |

Note: "Lab only" courses may NOT betaken CR/NC.

| *=Courses | satisfy | GE | requirement |
|-----------|---------|----|-------------|
|           |         |    |             |

| MAJOR COURSES (112)         Units         Grade         GrdPts           CHEM 127 General Chemistry I         4         4           CHEM 128 General Chemistry II         4         4           MATH 141 Calculus I (B1)*         4         4           MATH 142 Calculus II         4         4           MATH 241 Calculus IV         4         4           MATH 304 Vector Analysis         4         4           MATH 344 Linear Analysis II         4         4           PHYS 141 General Physics IA         4         4           PHYS 132 General Physics II         4         4           PHYS 133 General Physics III         4         4           PHYS 202 Physics on the Computer         4         4           PHYS 206 Instru in Exper Physics         3         3           PHYS 211 Modern Physics I         4         4           PHYS 212 Modern Physics II         4         4           PHYS 301 Thermal Physics I         4         4           PHYS 302 Classical Mechanics I         4         4           PHYS 340 Quantum Physics Lab II         1         1           PHYS 341 Quantum Physics Lab II         2         1           PHYS 405 Quantum Mechanics I         4 | *=Courses satisfy GE requirement  |       |       |        |
|---|-----------------------------------|-------|-------|--------|
| CHEM 128 General Chemistry II 4  MATH 141 Calculus I (B1)* 4  MATH 142 Calculus III (B1)* 4  MATH 143 Calculus III 4  MATH 241 Calculus IV 4  MATH 244 Linear Analysis I 4  MATH 304 Vector Analysis I 4  PHYS 141 General Physics IA 4  PHYS 132 General Phys II (B3&B4)* 4  PHYS 133 General Physics III 4  PHYS 202 Physics on the Computer 4  PHYS 206 Instru in Exper Physics 3  PHYS 211 Modern Physics I 4  PHYS 212 Modern Physics I 4  PHYS 256 Elec Measurements Lab 1  PHYS 301 Thermal Physics I 3  PHYS 302 Classical Mechanics I 4  PHYS 323 Optics 5  PHYS 340 Quantum Physics Lab I 2  PHYS 341 Quantum Physics Lab II 1  PHYS 342 Quantum Physics Lab II 1  PHYS 405 Quantum Mechanics I 4  PHYS 408 Electro Fields & Waves I 4  PHYS 461 or PHYS 464  Advanced Physics electives or   | MAJOR COURSES (112)               | Units | Grade | GrdPts |
| MATH 141 Calculus I (B1)*  MATH 142 Calculus III (B1)*  MATH 143 Calculus III 4  MATH 241 Calculus IV 4  MATH 244 Linear Analysis I 4  MATH 304 Vector Analysis 4  MATH 344 Linear Analysis II 4  PHYS 141 General Physics IA 4  PHYS 132 General Phys II (B3&B4)* 4  PHYS 202 Physics on the Computer 4  PHYS 206 Instru in Exper Physics 3  PHYS 211 Modern Physics I 4  PHYS 212 Modern Physics I 4  PHYS 256 Elec Measurements Lab 1  PHYS 301 Thermal Physics I 3  PHYS 302 Classical Mechanics I 4  PHYS 323 Optics 5  PHYS 340 Quantum Physics Lab I 2  PHYS 341 Quantum Physics Lab II 1  PHYS 342 Quantum Physics Lab II 1  PHYS 345 Quantum Mechanics I 4  PHYS 405 Quantum Mechanics I 4  PHYS 408 Electro Fields & Waves I 4  PHYS 461 or PHYS 463  PHYS 462 or PHYS 464  Advanced Physics electives or   | CHEM 127 General Chemistry I      | 4     |       |        |
| MATH 142 Calculus II (B1)*  MATH 143 Calculus III 4  MATH 241 Calculus IV 4  MATH 244 Linear Analysis I 4  MATH 304 Vector Analysis I 4  PHYS 141 General Physics IA 4  PHYS 132 General Phys II (B3&B4)* 4  PHYS 133 General Physics III 4  PHYS 202 Physics on the Computer 4  PHYS 206 Instru in Exper Physics 3  PHYS 211 Modern Physics I 4  PHYS 212 Modern Physics I 4  PHYS 256 Elec Measurements Lab 1  PHYS 301 Thermal Physics I 3  PHYS 302 Classical Mechanics I 4  PHYS 323 Optics 5  PHYS 340 Quantum Physics Lab I 2  PHYS 341 Quantum Physics Lab II 1  PHYS 342 Quantum Physics Lab II 1  PHYS 343 Quantum Physics Lab III 2  PHYS 405 Quantum Mechanics I 4  PHYS 408 Electro Fields & Waves I 4  PHYS 461 or PHYS 463 2  PHYS 462 or PHYS 464  Advanced Physics electives or  | CHEM 128 General Chemistry II     | 4     |       |        |
| MATH 143 Calculus III 4  MATH 241 Calculus IV 4  MATH 244 Linear Analysis I 4  MATH 304 Vector Analysis I 4  MATH 344 Linear Analysis II 4  PHYS 141 General Physics IA 4  PHYS 132 General Phys II (B3&B4)* 4  PHYS 133 General Physics III 4  PHYS 202 Physics on the Computer 4  PHYS 206 Instru in Exper Physics 3  PHYS 211 Modern Physics I 4  PHYS 212 Modern Physics II 4  PHYS 256 Elec Measurements Lab 1  PHYS 301 Thermal Physics I 3  PHYS 302 Classical Mechanics I 4  PHYS 323 Optics 5  PHYS 340 Quantum Physics Lab II 2  PHYS 341 Quantum Physics Lab II 1  PHYS 342 Quantum Physics Lab III 2  PHYS 405 Quantum Mechanics I 4  PHYS 405 Quantum Mechanics I 4  PHYS 461 or PHYS 463  PHYS 462 or PHYS 464  Advanced Physics electives or   | MATH 141 Calculus I (B1)*         | 4     |       |        |
| MATH 241 Calculus IV  MATH 244 Linear Analysis I  MATH 304 Vector Analysis I  MATH 344 Linear Analysis II  PHYS 141 General Physics IA  PHYS 132 General Phys II (B3&B4)* 4  PHYS 133 General Physics III  PHYS 202 Physics on the Computer 4  PHYS 206 Instru in Exper Physics 3  PHYS 211 Modern Physics I  PHYS 212 Modern Physics II  PHYS 256 Elec Measurements Lab 1  PHYS 301 Thermal Physics I  PHYS 302 Classical Mechanics I  PHYS 323 Optics 5  PHYS 340 Quantum Physics Lab II  PHYS 341 Quantum Physics Lab II  PHYS 342 Quantum Physics Lab III  PHYS 405 Quantum Mechanics I  PHYS 405 Quantum Mechanics I  PHYS 461 or PHYS 463  PHYS 462 or PHYS 464  Advanced Physics electives or  | MATH 142 Calculus II (B1)*        | 4     |       |        |
| MATH 244 Linear Analysis I  MATH 304 Vector Analysis II  MATH 344 Linear Analysis II  PHYS 141 General Physics IA  PHYS 132 General Phys II (B3&B4)* 4  PHYS 133 General Physics III  PHYS 202 Physics on the Computer 4  PHYS 206 Instru in Exper Physics 3  PHYS 211 Modern Physics I 4  PHYS 212 Modern Physics II 4  PHYS 256 Elec Measurements Lab 1  PHYS 301 Thermal Physics I 3  PHYS 302 Classical Mechanics I 4  PHYS 323 Optics 5  PHYS 340 Quantum Physics Lab II 2  PHYS 341 Quantum Physics Lab II 1  PHYS 342 Quantum Physics Lab III 2  PHYS 405 Quantum Mechanics I 4  PHYS 406 Or PHYS 463 2  PHYS 462 or PHYS 464  Advanced Physics electives or   | MATH 143 Calculus III             | 4     |       |        |
| MATH 304 Vector Analysis I  MATH 344 Linear Analysis II 4  PHYS 141 General Physics IA 4  PHYS 132 General Phys II (B3&B4)* 4  PHYS 133 General Physics III 4  PHYS 202 Physics on the Computer 4  PHYS 206 Instru in Exper Physics 3  PHYS 211 Modern Physics I 4  PHYS 212 Modern Physics II 4  PHYS 256 Elec Measurements Lab 1  PHYS 301 Thermal Physics I 3  PHYS 302 Classical Mechanics I 4  PHYS 323 Optics 5  PHYS 340 Quantum Physics Lab I 2  PHYS 341 Quantum Physics Lab II 1  PHYS 342 Quantum Physics Lab III 2  PHYS 405 Quantum Mechanics I 4  PHYS 406 Or PHYS 463 2  PHYS 462 or PHYS 464 2  Advanced Physics electives or   | MATH 241 Calculus IV              | 4     |       |        |
| MATH 344 Linear Analysis II  PHYS 141 General Physics IA  PHYS 132 General Phys II (B3&B4)* 4  PHYS 133 General Physics III  PHYS 202 Physics on the Computer 4  PHYS 206 Instru in Exper Physics 3  PHYS 211 Modern Physics I 4  PHYS 212 Modern Physics II 4  PHYS 256 Elec Measurements Lab 1  PHYS 301 Thermal Physics I 3  PHYS 302 Classical Mechanics I 4  PHYS 323 Optics 5  PHYS 340 Quantum Physics Lab I 2  PHYS 341 Quantum Physics Lab II 1  PHYS 342 Quantum Physics Lab III 2  PHYS 405 Quantum Mechanics I 4  PHYS 408 Electro Fields & Waves I 4  PHYS 461 or PHYS 463  PHYS 462 or PHYS 464  Advanced Physics electives or  | MATH 244 Linear Analysis I        | 4     |       |        |
| PHYS 141 General Physics IA PHYS 132 General Phys II (B3&B4)* 4 PHYS 133 General Physics III 4 PHYS 202 Physics on the Computer 4 PHYS 206 Instru in Exper Physics 3 PHYS 211 Modern Physics I 4 PHYS 212 Modern Physics II 4 PHYS 256 Elec Measurements Lab 1 PHYS 301 Thermal Physics I 3 PHYS 302 Classical Mechanics I 4 PHYS 302 Optics 5 PHYS 340 Quantum Physics Lab I 2 PHYS 341 Quantum Physics Lab II 1 PHYS 342 Quantum Physics Lab III 2 PHYS 405 Quantum Mechanics I 4 PHYS 405 Quantum Mechanics I 4 PHYS 461 or PHYS 463 2 PHYS 462 or PHYS 464 2 Advanced Physics electives or  | MATH 304 Vector Analysis          | 4     |       |        |
| PHYS 132 General Phys II (B3&B4)* 4  PHYS 133 General Physics III 4  PHYS 202 Physics on the Computer 4  PHYS 206 Instru in Exper Physics 3  PHYS 211 Modern Physics I 4  PHYS 212 Modern Physics II 4  PHYS 256 Elec Measurements Lab 1  PHYS 301 Thermal Physics I 3  PHYS 302 Classical Mechanics I 4  PHYS 323 Optics 5  PHYS 340 Quantum Physics Lab I 2  PHYS 341 Quantum Physics Lab II 1  PHYS 342 Quantum Physics Lab III 2  PHYS 405 Quantum Mechanics I 4  PHYS 405 Quantum Mechanics I 4  PHYS 461 or PHYS 463  PHYS 462 or PHYS 464  Advanced Physics electives or   | MATH 344 Linear Analysis II       | 4     |       |        |
| PHYS 133 General Physics III 4 PHYS 202 Physics on the Computer 4 PHYS 206 Instru in Exper Physics 3 PHYS 211 Modern Physics I 4 PHYS 212 Modern Physics II 4 PHYS 256 Elec Measurements Lab 1 PHYS 301 Thermal Physics I 3 PHYS 302 Classical Mechanics I 4 PHYS 323 Optics 5 PHYS 340 Quantum Physics Lab I 2 PHYS 341 Quantum Physics Lab II 1 PHYS 342 Quantum Physics Lab III 2 PHYS 405 Quantum Mechanics I 4 PHYS 405 Quantum Mechanics I 4 PHYS 406 I or PHYS 463 2 PHYS 462 or PHYS 464 2 Advanced Physics electives or  | PHYS 141 General Physics IA       | 4     |       |        |
| PHYS 202 Physics on the Computer PHYS 206 Instru in Exper Physics PHYS 211 Modern Physics I PHYS 212 Modern Physics II PHYS 256 Elec Measurements Lab PHYS 301 Thermal Physics I PHYS 302 Classical Mechanics I PHYS 323 Optics PHYS 340 Quantum Physics Lab I PHYS 341 Quantum Physics Lab II PHYS 342 Quantum Physics Lab III PHYS 342 Quantum Physics Lab III PHYS 405 Quantum Mechanics I PHYS 406 Or PHYS 463 PHYS 462 or PHYS 464 Advanced Physics electives or   | PHYS 132 General Phys II (B3&B4)* | 4     |       |        |
| PHYS 206 Instru in Exper Physics 3 PHYS 211 Modern Physics I 4 PHYS 212 Modern Physics II 4 PHYS 256 Elec Measurements Lab 1 PHYS 301 Thermal Physics I 3 PHYS 302 Classical Mechanics I 4 PHYS 323 Optics 5 PHYS 340 Quantum Physics Lab I 2 PHYS 341 Quantum Physics Lab II 1 PHYS 342 Quantum Physics Lab III 2 PHYS 405 Quantum Mechanics I 4 PHYS 408 Electro Fields & Waves I 4 PHYS 461 or PHYS 463 2 PHYS 462 or PHYS 464 2 Advanced Physics electives or   | PHYS 133 General Physics III      | 4     |       |        |
| PHYS 211 Modern Physics I 4 PHYS 212 Modern Physics II 4 PHYS 256 Elec Measurements Lab 1 PHYS 301 Thermal Physics I 3 PHYS 302 Classical Mechanics I 4 PHYS 323 Optics 5 PHYS 340 Quantum Physics Lab I 2 PHYS 341 Quantum Physics Lab II 1 PHYS 342 Quantum Physics Lab III 2 PHYS 405 Quantum Mechanics I 4 PHYS 408 Electro Fields & Waves I 4 PHYS 461 or PHYS 463 2 PHYS 462 or PHYS 464 2 Advanced Physics electives or  | PHYS 202 Physics on the Computer  | 4     |       |        |
| PHYS 211 Modern Physics I 4 PHYS 212 Modern Physics II 4 PHYS 256 Elec Measurements Lab 1 PHYS 301 Thermal Physics I 3 PHYS 302 Classical Mechanics I 4 PHYS 323 Optics 5 PHYS 340 Quantum Physics Lab I 2 PHYS 341 Quantum Physics Lab II 1 PHYS 342 Quantum Physics Lab III 2 PHYS 405 Quantum Mechanics I 4 PHYS 408 Electro Fields & Waves I 4 PHYS 461 or PHYS 463 2 PHYS 462 or PHYS 464 2 Advanced Physics electives or  | PHYS 206 Instru in Exper Physics  | 3     |       |        |
| PHYS 256 Elec Measurements Lab  PHYS 301 Thermal Physics I  PHYS 302 Classical Mechanics I  PHYS 323 Optics  PHYS 340 Quantum Physics Lab I  PHYS 341 Quantum Physics Lab II  PHYS 342 Quantum Physics Lab III  PHYS 405 Quantum Mechanics I  PHYS 408 Electro Fields & Waves I  PHYS 461 or PHYS 463  PHYS 462 or PHYS 464  Advanced Physics electives or  |                                   | 4     |       |        |
| PHYS 301 Thermal Physics I  PHYS 302 Classical Mechanics I  PHYS 323 Optics  PHYS 340 Quantum Physics Lab I  PHYS 341 Quantum Physics Lab II  PHYS 342 Quantum Physics Lab III  PHYS 405 Quantum Mechanics I  PHYS 408 Electro Fields & Waves I  PHYS 461 or PHYS 463  PHYS 462 or PHYS 464  Advanced Physics electives or  | PHYS 212 Modern Physics II        | 4     |       |        |
| PHYS 302 Classical Mechanics I 4 PHYS 323 Optics 5 PHYS 340 Quantum Physics Lab I 2 PHYS 341 Quantum Physics Lab II 1 PHYS 342 Quantum Physics Lab III 2 PHYS 405 Quantum Mechanics I 4 PHYS 408 Electro Fields & Waves I 4 PHYS 461 or PHYS 463 2 PHYS 462 or PHYS 464 2 Advanced Physics electives or   | PHYS 256 Elec Measurements Lab    | 1     |       |        |
| PHYS 323 Optics  PHYS 340 Quantum Physics Lab I  PHYS 341 Quantum Physics Lab II  PHYS 342 Quantum Physics Lab III  PHYS 405 Quantum Mechanics I  PHYS 408 Electro Fields & Waves I  PHYS 461 or PHYS 463  PHYS 462 or PHYS 464  Advanced Physics electives or  | PHYS 301 Thermal Physics I        | 3     |       |        |
| PHYS 340 Quantum Physics Lab I 2 PHYS 341 Quantum Physics Lab II 1 PHYS 342 Quantum Physics Lab III 2 PHYS 405 Quantum Mechanics I 4 PHYS 408 Electro Fields & Waves I 4 PHYS 461 or PHYS 463 2 PHYS 462 or PHYS 464 2 Advanced Physics electives or  | PHYS 302 Classical Mechanics I    | 4     |       |        |
| PHYS 341 Quantum Physics Lab II 1 PHYS 342 Quantum Physics Lab III 2 PHYS 405 Quantum Mechanics I 4 PHYS 408 Electro Fields & Waves I 4 PHYS 461 or PHYS 463 2 PHYS 462 or PHYS 464 2 Advanced Physics electives or   | PHYS 323 Optics                   | 5     |       |        |
| PHYS 342 Quantum Physics Lab III 2 PHYS 405 Quantum Mechanics I 4 PHYS 408 Electro Fields & Waves I 4 PHYS 461 or PHYS 463 2 PHYS 462 or PHYS 464 2 Advanced Physics electives or   | PHYS 340 Quantum Physics Lab I    | 2     |       |        |
| PHYS 405 Quantum Mechanics I       4         PHYS 408 Electro Fields & Waves I       4         PHYS 461 or PHYS 463       2         PHYS 462 or PHYS 464       2         Advanced Physics electives or  | PHYS 341 Quantum Physics Lab II   | 1     |       |        |
| PHYS 408 Electro Fields & Waves I 4 PHYS 461 or PHYS 463 2 PHYS 462 or PHYS 464 2 Advanced Physics electives or   | PHYS 342 Quantum Physics Lab III  | 2     |       |        |
| PHYS 461 <i>or</i> PHYS 463 2 PHYS 462 <i>or</i> PHYS 464 2 Advanced Physics electives or   |                                   | 4     |       |        |
| PHYS 462 or PHYS 464 2 Advanced Physics electives or  | PHYS 408 Electro Fields & Waves I | 4     |       |        |
| Advanced Physics electives or   | PHYS 461 <i>or</i> PHYS 463       | 2     |       |        |
|   | PHYS 462 or PHYS 464              | 2     |       |        |
| Concentration courses (see back) 19   | Advanced Physics electives or     |       |       |        |
|   | Concentration courses (see back)  | 19    |       |        |
|   |                                   |       |       |        |
|   |                                   |       |       |        |
|   |                                   |       |       |        |
|   |                                   |       |       |        |
|   |                                   |       |       |        |
|   |                                   |       |       |        |
|   |                                   |       |       |        |
|   |                                   |       |       |        |
|   |                                   |       |       |        |

| GENERAL EDUCATION (GE)  | 60    |
|---|-------|
| 72 units required  Minimum of 12 units required at the 300-400 level. |       |
| Area A Communication  | 12    |
| A1 ENGL 133/134   | 4     |
| A2 COMS 101/102   |       |
| A3 Reason, Argu, & Writ   |       |
| Area B Science and Mathematics  | 4     |
| B2 Life Science   | 4     |
| Area C Arts and Humanities  | 20    |
| C1 Literature   | 4     |
| C2 PHIL 230/231   | 4     |
| C3 Fine/Performing Arts   | 4     |
| C4 Upper-division elective  |       |
| C1-C4 elective  | 4     |
| Area D/E Society and the Individual                                   | 20    |
| D1 Amer Experience (40404)  | 4     |
| D2 Political Economy  | 4     |
| D3 Comp Social Institutions   | 4     |
| D4 Self Develop (CSU Area E)  | 4     |
| D5 Upper-division elective  | 4     |
| Area F Technology (upper div)   | 4     |
| Add'l GE Units (if needed)  |       |
| (, ···················  |       |
|   |       |
| O = Work in progress @ = possible credit by Department r              | eview |
| () = not allowed for degree credit # = GE Certification               |       |

ELECTIVES.....

8

# ADVANCED PHYSICS ELECTIVES OR CONCENTRATION

Select either the advanced physics electives or one of the concentrations

### **Advanced Physics Electives**

Select one of the following: PHYS 424 (3) *or* MATH 418 (4).

In addition, select courses at the 300 or 400 level with the prefixes PHYS, MATH, GEOL, STAT, or CSC (but not CSC 302 nor CSC 310). One of the following may also be chosen: CSC 101 (4), 231 (2), 234 (3). At least 9 of these elective units must have the PHYS prefix. All courses must be taken for a letter grade.

For students anticipating an industrial career PHYS 357 (3), 412 (3), 413 (3), 423 (4), and 452 (1) are suggested electives.

For students anticipating graduate work in physics PHYS 303 (3), 401 (3), 406 (3), 409 (3), 424 (3), and MATH 408 (4) are suggested electives. In addition, PHYS 357 (3) is suggested for students who anticipate becoming experimental physicists.

#### 19

#### **Electronics Concentration**

Students will not be allowed to enroll in EE 228 until they have a) completed PHYS 357 and MATH 344, and b) received the approval of advisors in both Physics and Electrical Engineering. Students will then be allowed to enroll in EE courses with physics courses substituting for EE prerequisites.

| EE 228 Continuous-Time Signals & Systems   | 4  |
|--|----|
| EE 302 Classic Control Systems             | 3  |
| EE 328 Discrete Time Signals & Systems     | 3  |
| EE 342 Classical Control Systems Lab       | 1  |
| EE 368 Signals & Systems Lab               | 1  |
| EE 336 or EE 306 & EE 346                  | 4  |
| PHYS 357 Advanced Instru in Experi Physics | 3  |
|  | 19 |

#### **Electro-optics Concentration**

Students will not be allowed to enroll in EE 228 until they have a) completed PHYS 357 and MATH 344, and b) received approval of advisors in both Physics and Electrical Engineering. Students will then be allowed to enroll in EE courses with physics courses substituting for EE prerequisites.

| EE 228 Continuous-Time Signals & Systems   | 4 |
|--|---|
| EE 403 Fiber Optics Communication          | 3 |
| EE 418 Photonic Engineering                | 3 |
| EE 443 Fiber Optics Lab                    | 1 |
| EE 458 Photonic Engineering Lab            | 1 |
| PHYS 357 Advanced Instru in Experi Physics | 3 |

| PHYS 423 Advanced Optics | 4  |
|--------------------------|----|
|                          | 19 |