PHYSICS — 12 COURSE OUTLINE

This outline provides a description of the material covered in Physics 12

Q = questions, P = problems.

**1 — Vectors and Projectiles**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Giancoli V5 | Giancoli V6 |
| 1 | Vectors Addition - Geometry | p. 70: 1, 2, 5, 11, 12, 13 | p. 65: 1, 2, 5, 10, 11, 12 |
| 2 | Vectors Addition - Components | p. 70: 4, 8, 11, 14, 15 | p. 65: 4, 7, 8, 10, 13, 14 |
| 3 | Navigation | p. 70: 40-43, 45, 46, 49-53 | p. 65: 36-39, 41, 42, 45-49 |
| 4 | Relative Velocity | p. 70: 44, 55, 65, 56 | p. 65: 40, 52, 59, 50 |
| 5 | 1-D Kinematics Review | p. 42: 15, 16, 21, 38, 41, 46 | p. 39: 17, 19, 23, 37, 39, 44 |
| 6 | Projectiles I | p. 70: 19, 20, 22, 24, 26, 27, 30, 31, 35 | p. 65: 17, 18, 20-24, 27, 30 |
| 7 | Projectiles II | p. 70: 36, 28, 38, 71, 73 | p. 65: 31, 32, 35, 65, 67, 70 |
| 8 | Range Formula (extension) | p. 70: 21, 32, At what angle(s) will the range of a projectile equal its maximum height? | p. 65: 19, 26, 33 |

**2 — 2-Dimensional Dynamics**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Giancoli V5 | Giancoli V6 |
| 1 | Newton’s Laws and Forces | p. 104: 4, 5, 9, 13, 15, 16, 34 | p. 98: 3, 4, 8, 12, 14, 15, 32 |
| 2 | Friction | p. 107: 38, 39, 42, 45, 47 | p. 101: 36, 37, 44, 48, 49 |
| 3 | Friction: Inclines | p. 107: 50, 52, 53, 55, 56 | p. 101: 51, 52, 53, 54, 55 |
| 4 | Multi Particle Problems | p. 106: 30, 32a, 35, 45  p. 110: 61, 62, 81 | p. 100: 25, 29a, 33, 48  p. 103: 63, 64, 76 |
| 6 | Static Equilibrium - Concurrent Forces | p. 266: 1, 5, 12, 13, 16, 66, worksheet | p. 247: 1, 5, 11, 12, 14, 58, worksheet |

**3 — Energy and momentum**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Giancoli V5 | Giancoli V6 |
| 1 | Work and Power | p. 174: 3, 9, 10, 11, 13 | p. 162: 4, 6, 8, 9, 12 |
| 2 | Work-Energy Theorem | p. 175: 17, 23, 25, 31, 33, 59, 64, 65, 70 | p. 162: 15, 20, 22, 28, 31, 59, 65, 66, 71 |
| 3 | Conservation of energy: Frictionless | p. 176: 35, 37, 38, 40, 41 | p. 163: 33, 35, 36, 38, 43 |
| 4 | Conservation of energy: Friction | p. 177: 50, 51, 53, 54, 74, 76, work assignment | p. 164: 48, 49, 53, 54, 74, 77, work assignment |
| 5 | One-Dimensional Momentum | p. 202: 3, 5, 11, 16, 18, 19 | p. 188: 5, 7, 12, 15, 19, 20 |
| 6 | Two-Dimensional Collisions | p. 203: 17, 37, 44, handout | p. 189: 17, 40, 44, handout |
| 7 | Energy and Collisions | p. 203: 21, 23, 30, 33, 65 | p. 189: 22, 24, 32, 35, 64 |

**4 — Circular Motion and Gravity**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Giancoli V5 | Giancoli V6 |
| 1 | 2D Circular Motion | p. 139: 2, 4, 5, 6, 7, 9, 10, 11 | p. 130: 1, 4, 6, 8, 9, 10, 11, 12, 19 |
| 2 | 3D Circular Motion | p. 139: 18, 20, 73, 76 | p. 130: 18, 21, 22, 76, 79 |
| 3 | Vertical Circular Motion | p. 139: 1, 8, 12, 13, 14, 46, 63, 82 | p. 130: 2, 7, 13, 14, 15, 16, 50, 66, 82 |
| 4 | Satellites and Gravity | p. 139: 3, 25, 39, 41, 42, 43, 49, 50, 74, 78 | p. 130: 3, 5, 28, 43, 45, 46, 48, 52, 55, 77, 81 |
| 5 | Gravitational Potential Energy | Hand out | Hand out |
| 6 | Escape Velocity | Hand out | Hand out |
|  |  |  |  |

**5 — Electrostatics**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Giancoli V5 | Giancoli V6 |
| 1 | Coulomb’s Law  (2 particles) | p. 496: Q 4, 8, 9  P 2, 4, 5, 7, 8, 15 | p. 464: Q 4, 8, 9  P 1, 3, 5, 6, 8, 10 |
| 2 | Coulomb’s Law  (Multiple particles) | p. 496: 11-14, 20 | p. 464: 12-15, 17, 18 |
| 3 | Electric Field  (single charge) | p. 496: Q 14, 19  P 21-25, 27, 35, 49, 53 | p. 464: Q 13, 18  P 23-27, 30, 31, 64, 67 |
| 4 | Electric Field  (multiple charges) | p. 496: 26, 28, 29, 31-34, 38 | p. 464: 28, 29, 32-37, 40, 41 |
| 5 | Electric Potential Energy | p. 522: 15, 18, 20, 21 | p. 489: 16, 20, 21, 23 |
| 6 | Electric Potential | p. 522: 1, 3, 5, 6, 8, 10, 12, 14, 15, 17 | p. 489: 1-15 (odd), 19, 25 |

**6 — Electro-Magnetism**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Giancoli V5 | Giancoli V6 |
| 1 | Magnetic Fields | p. 615: Q 1-4, 7, 9, 11 P 36, 38 | p. 576: Q 1-4, 6, 7, 14 P 48, 49, 52, 85 |
| 2 | Forces on charges – current on a wire | p. 615: Q 23, 24  P 1-4, 11, 12 | p. 576: Q 25, 26  P 1-8, 50 |
| 3 | Forces on charges – free charges | p. 615: Q 12, 17, 18  P 5-10, 59, 60 | p. 576: Q 8-11, 15, 18  P 9-15, 68, 71, 84 |
| 4 | Applications – speaker, Galvanometer, motor | motor pamphlet | motor rule pamphlet |
| 5 | Applications – velocity selector, MS | p. 615: Q 15, 27  P 50-52, 63 | p. 576: Q 16, 20, 29  P 16-18, 60-62, 72 |
| 6 |  |  |  |