

| BMC2 | | | | | | |
|--|--------------------------|---------|--|----------|-----------------|-------------------------|
| Introduction to biophysics curriculum | | | | | | |
| Week | Date | Chapter | Title | Lecturer | Seminar teacher | Seminar topic (chapter) |
| 1 | 7 January Wednesday | 1 | 1. Introduction to modern physics. Standard of lengths, mass, time. | JA | JA,NE,SZGT,PF | 1 |
| 2 | 12 January Monday | 2 | 2. Motion in one dimension, displacement, velocity, acceleration, motion diagrams. Freely falling objects. | JA | JA,NE,SZGT,PF | 2 |
| | 14 January Wednesday | 2 | 3. Motion in two dimensions. Relative velocity. | JA | | |
| 3 | 19 January Monday | 3 | 4. The laws of motion. Newton's First, Second and Third Law. Application of Newton's Laws. Forces of friction. | JA | JA,NE,SZGT,PF | 3 |
| | 21 January Wednesday | 4 | 5. Application of Newton's Laws. Forces of friction. | JA | | |
| 1st SCT material covered up to (including) the 2nd week seminars | | | | | | |
| 4 | 26 January Monday | 4 | 6. Energy. Work. Kinetic energy and the work-energy theorem. Gravitational potential energy. | JA | JA,NE,SZGT,PF | 4 |
| | 28 January Wednesday | 5 | 7. Spring potential energy. System and energy conservation. Power. Work done by varying forces. | JA | | |
| 5 | 2 February Monday | 6 | 8. Momentum and impulse. Conservation of momentum. | JA | JA,NE,SZGT,PF | 5 |
| | 4 February Wednesday | 6 | 9. Collisions. Elastic and inelastic collisions. | JA | | |
| 6 | 9 February Monday | 7 | 10. Angular speed and angular acceleration. Rotational motion under constant angular acceleration. | JA | JA,NE,SZGT,PF | 6 |
| | 11 February Wednesday | 7 | 11. Centripetal acceleration. | JA | | |
| 2nd SCT material covered up to (including) the 5th week seminars | | | | | | |
| 7 | 16 February Monday | 8 | 12. Torque and the two conditions for equilibrium. The center of gravity. | JA | JA,NE,SZGT,PF | 7 |
| | 18 February Wednesday | 8 | 13. Rotational kinetic energy. Angular momentum. | JA | | |
| 8 | 23 February Monday | 9 | 14. States of matter. Deformation of solids. The Young's, shear and bulk modulus. | JA | JA,NE,SZGT,PF | 8 |
| | 25 February Wednesday | 9 | 15. Density and pressure. Variation of pressure with depth. Pressure measurements. Buoyant forces and Archimedes's principle. Fluids in motion. | JA | | |
| 9 | 2 March Monday | 10 | 16. Temperature and the zeroth law of thermodynamics. Thermometers and temperature scales. Thermal expansion of solids and fluids. | JA | JA,NE,SZGT,PF | 9 |
| | 4 March Wednesday | 10 | 17. Macroscopic description of an ideal gas. The kinetic theory of gases. | JA | | |
| 10 | 9 March Wednesday | 11 | 18. Energy in thermal processes. Heat and internal energy. Specific heat. Calorimetry. Latent heat and phase change. | JA | JA,NE,SZGT,PF | 10 |
| | 11 March Wednesday | 12 | 19. The first law of thermodynamics. | JA | | 11 |
| 3rd SCT material covered up to (including) the 9th week seminars | | | | | | |
| 11 | 16 March Monday | 12 | 20. The second law of thermodynamics. Entropy. Refrigerators and heat pumps. | JA | JA,NE,SZGT,PF | 11 |
| | 18 March Wednesday | 13 | 21. Elastic potential energy. Hooke's law. Simple harmonic motion. Motion of a pendulum. | JA | | 12 |
| 12 | 23 March Monday | 13 | 21. Elastic potential energy. Hooke's law. Simple harmonic motion. Motion of a pendulum. | JA | JA,NE,SZGT,PF | 12 |
| | 25 March Wednesday | 13 | 22. Waves. Frequency, amplitude and wavelength. Interference of waves. Reflection of waves. | JA | | |
| 13 | 30 March Monday | 14 | 23. Sound. Energy and intensity of sound waves. Shock waves, standing waves. Doppler effect. | JA | JA,NE,SZGT,PF | 13 |
| | 1 April Wednesday | 15 | 24. Properties of electric charges. Insulators and conductors. Coulomb's law. | JA | | |
| 14 | 6 April Monday | 15 | 25. Electric field. Electric field lines. Electric flux and Gauss's law. | JA | JA,NE,SZGT,PF | 14 |
| | 8 April Wednesday | 16 | 26. Electrical energy and capacitance. | JA | | |
| 4th SCT material covered up to (including) the 13th week seminars | | | | | | |
| 15 | 13 April Monday | 16 | 27. The parallel plate capacitor. Combinations of capacitors. Energy stored in capacitors. Capacitors with dielectric. | JA | JA,NE,SZGT,PF | 15 |
| | 15 April Wednesday | 17 | 28. Electric current. Current and voltage measurements in circuits. Resistance and Ohm's law. | JA | | 15 |
| 16 | 20 April Monday | 17 | 29. Resistivity, temperature variation of resistance. Semiconductors and superconductors. Electrical activity of the heart. Defibrillators. | JA | JA,NE,SZGT,PF | 16 |
| | 22 April Wednesday | 18 | 30. Direct current circuits. Resistors in parallel and series. | JA | | |
| 17 | 27 April Monday | 18 | 31. Kirchhoff's rules and complex DC circuits. RC circuits. Conduction of electrical signals by neurons. | JA | JA,NE,SZGT,PF | 17 |
| | 29 April Wednesday | 19 | 32. Magnetism. Magnetic field. Earth's magnetic field. Magnetic force on current carrying conductors. Torque on a current loop and electric motors. | JA | | |
| 18 | 4 May Monday | 19 | 33. Magnetic field of a long straight wire and Ampere's law. Magnetic field between two parallel conductors. Magnetic field of loops and solenoids. | JA | JA,NE,SZGT,PF | 18 |
| | 6 May Wednesday | 20 | 34. Induced emf and magnetic flux. Faraday's law of induction. Motional emf. Lenz's law. | JA | | |
| 5th SCT material covered up to (including) the 7th week seminars | | | | | | |
| 19 | 11 May Monday | 20 | 35. Generators. Self-inductance RL circuits. | JA | JA,NE,SZGT,PF | 19 - 20 |
| | 13 May Wednesday | 21 | 36. Alternating current. Resistors, capacitors and inductors in AC circuits. | JA | | |
| 20 | 18 May Monday | 21 | 37. The transformer. Properties of electromagnetic waves. The spectrum of electromagnetic waves. | JA | JA,NE,SZGT,PF | 20 - 21 |
| | 20 May Wednesday | 22 | 38. The nature of light. Reflection, refraction and dispersion. Total internal reflection and its medical applications. | JA | | |
| 21 | 27 May Monday | 23 | 39. Lenses and mirrors. Flat mirrors. Images formed by spherical mirrors. | JA | JA,NE,SZGT,PF | 21 - 22 |
| | 27 May Wednesday | 23 | 40. Thin lenses. Images formed by lenses. Lens aberrations. | JA | | |
| 22 | 1 June Monday | 24 | 41. Wave optics. Conditions for interference, polarization of light. Diffraction. | JA | JA,NE,SZGT,PF | 22 - 23 |
| | 3 June Wednesday | 25 | 42. The camera, the simple magnifier, the compound microscope, the telescope and the eye. | JA | | |
| 6th SCT material covered up to (including) the 21st week seminars | | | | | | |
| 23 | 8 June Monday | 27 | 43. Quantum physics. Blackbody radiation, photoelectric effect. | JA | JA,NE,SZGT,PF | 24-30 |
| | 10 June Wednesday | 28-29 | 44. Some properties of the nuclei. Binding energy. Radioactivity, the decay processes. Medical application of radioactivity. Nuclear reactions. Nuclear fission and fusion. Positron and other antiparticles. Mesons and quarks. | JA | | |