**MYP 4 Course overview 2019/2020 PHYSICS**

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| **Unit title** | **Key concept** | **Related concepts** | **Global context** | **Statement of inquiry** | **Objectives** | **ATL skills** | **Content** |
| **THE SCIENCE**  **OF PHYSICS**  **Sep – Nov**  **Special:**  **CERN - community** | Form | Form  Systems | Personal and cultural expression | The results of scientific investigations should be presented using specific forms of expression, allowing insight in all steps of the scientific method, providing information about precision and using appropriate system of measuring units. | A  ii  B  i, ii, iii, iv  C  i, ii, iii, iv, v  D  iii | **Communication**  *Understand and use mathematical notation*  *Structure information in reports*  **Self-management**  *Keep an organized notebook*  *Meet deadlines*  **Thinking**  *Interpret data*  *Draw reasonable conclusions and generalizations*  **Research**  *Collect, record and verify data*  *Process data and report results* | **Disciplinary knowledge**  *Physical quantities and measuring units and their symbols*  *Measuring*  *Power of ten shorthand and scientific notation*  *Significant figures*  *Applying statistics to data processing*  *Scientific method*  **Disciplinary skills**  *Converting units*  *Applying scientific method*  *Data processing*  *Writing scientific report*  **Attitudes**  *Performance in experiment* |
| **FORCES**  **Nov - Feb**  **Special:**  **Black holes** | Relationships | Interaction  Patterns | Scientific and technical innovation | Understanding interactions between bodies and underlying mathematical patterns reflecting laws and relationships in nature, scientific and technical innovations are possible. | A  i, ii, iii  B  i, ii, iii, iv  C  i, ii, iii, iv, v | **Communication**  *Understand and use mathematical notation*  *Organize and depict information logically*  **Thinking**  *Interpret data*  *Apply skills and knowledge in unfamiliar situations*  **Research**  *Collect, record and verify data*  *Process data and report results*  **Social**  *Listen actively to other perspectives and ideas* | **Disciplinary knowledge**  *Concept of force*  *1st and 3rd Newton’s law*  *Examples of forces and their properties (gravity, weight, friction, elastic force)*  *Adding and resolving forces*  **Disciplinary skills**  *Drawing and interpreting graphs and diagrams*  *Applying knowledge on numerical and practical problems*  **Attitudes**  *Performance in experiment*  *Connecting knowledge with everyday life* |
| **MOTION**  **Feb - Apr**  **Special:**  **Motion in time** | Time, place and space | Movement  Patterns  Consequences | Orientation in space and time | If we know the forces acting on a body we can exactly describe its consequent motion patterns, meaning how its position (place), speed and acceleration vary in time and space. | A  i, ii, iii  D  i, ii, iii, iv | **Communication**  *Use appropriate forms of writing for different purposes and audiences*  *Understand and use mathematical language*  *Structure information in essays*  **Thinking**  *Apply skills and knowledge in unfamiliar situations*  **Research**  *Understand and implement intellectual property rights* | **Disciplinary knowledge**  *Newton’s laws*  *Speed, velocity*  *and acceleration*  *Equations of motion*  *2D motion*  **Disciplinary skills**  *Drawing and transforming motion graphs from one to another*  *Applying different communication modes (text, graphs, formulae)*  *Applying knowledge on numerical and practical problems*  **Attitudes**  *Connecting knowledge with everyday life*  *Appreciating academic honesty* |
| **ENERGY, WORK AND POWER**  **Mai - Jun**  **Special:**  **Dark energy and antimatter** | Change | Energy  Transformation | Globalization and sustainability | The total amount of energy in a closed system is conserved, though limited - it can only be a subject of transformation and change of form, so we have to seriously consider sustainability at the global level. | A  i, ii, iii, iv  D  i, ii, iii, iv | **Communication**  *Understand and use mathematical language*  *Structure information in essays*  *Make inferences and draw conclusions*  **Thinking**  *Propose and evaluate a variety of solutions*  **Research**  *Seek a range of perspectives from multiple and varied sources*  *Create references and citations, use footnotes/endnotes and construct a bibliography according to recognized conventions*  **Social**  *Consider ethical, cultural and environmental implications* | **Disciplinary knowledge**  *Concept of energy, work and power*  *Potential and kinetic energy*  *Energy in different systems*  *Efficiency*  *Conservation laws*  **Disciplinary skills**  *Applying knowledge on numerical and practical problems*  **Attitudes**  *Connecting knowledge with everyday life*  *Responsibility and integrity* |

**MYP 5 Course overview 2018/2019 PHYSICS**

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| **Unit title** | **Key concept** | **Related concepts** | **Global context** | **Statement of inquiry** | **Objectives** | **ATL skills** | **Content** |
| **PRESSURE**  **Sep - Oct** | Relationships | Consequences  Evidence | Identities and relationships | There is evidence that pressure in and around our body has positive and negative consequences, so there is a strong relationship between different aspects of pressure and our individual health and general well-being. | A  i, ii, iii  B  i, ii, iii, iv  C  i, ii, iii, iv, v  D  iii | **Communication**  *Understand and use mathematical notation*  *Structure information in reports*  **Thinking**  *Apply skills and knowledge in unfamiliar situations*  **Research**  *Collect, record and verify data*  *Process data and report results* | **Disciplinary knowledge and understanding**  *Pressure*  *Atmospheric, hydrostatic and hydraulic pressure*  *Buoyancy, floating and sinking*  *Simple hydrodynamics*  **Disciplinary skills**  *Applying knowledge on numerical and practical problems*  **Attitudes**  *Performance in experiment*  *Connecting knowledge to everyday life* |
| **HEAT AND**  **THERMAL**  **EFFECTS**  **Nov - Jan** | Relationships | Consequences  Patterns  Development | Scientific and technical innovation | Understanding the physical implications of mathematical patterns in gas laws and laws of thermodynamics as well as relationships among the state variables of a gas, scientific and technical innovations and consequent social development was possible (industrial revolution). | A  i, ii, iii  B  i, ii, iii, iv  C  i, ii, iii, iv, v | **Communication**  *Organize and depict information logically*  **Thinking**  *Draw reasonable conclusions and generalizations*  **Research**  *Collect and analyse data to identify solutions*  **Social**  *Consider ethical, cultural and environmental implications* | **Disciplinary knowledge and understanding**  *Internal energy, temperature and heat*  *Heat transfer*  *The gas laws*  *Laws of thermodynamics*  *Cyclic processes and heat engine*  **Disciplinary skills**  *Transforming graphs*  *Applying different communication modes (text, sketches, graphs, formulae)*  *Applying knowledge on numerical and practical problems*  **Attitudes**  *Connecting knowledge to everyday life*  *Responsibility and integrity* |
| **WAVES**  **Feb - Apr** | Connections | Patterns  Models  Form  Evidence | Scientific and technical innovations | Evidence of equal patterns of reflection, refraction, diffraction and interference of all mechanical and electromagnetic waves, which is used in scientific and technical innovations, is connected to the same mathematical model which describes their form. | A  i, ii, iii  D  i, ii, iii, iv | **Communication**  *Understand and use mathematical language and various communication modes*  *Find information for disciplinary and interdisciplinary inquiries, using a variety of media*  *Structure information in essays*  **Thinking**  *Practise observing carefully*  *Draw reasonable conclusions and generalizations*  *Make connections between subject groups and disciplines*  **Research**  *Locate, organize, analyse, evaluate, synthesize and ethically use information from a variety of sources and media* | **Disciplinary knowledge and understanding**  *Origin and propagation of waves*  *Describing waves: wavelength and frequency*  *Reflection and refraction*  *Diffraction and interference*  ***Light as a wave***  ***The Magic of Sound:***  *Properties of sound (light) waves*  *Speed of sound (light)*  *Level of intensity of sound (light)*  *Acoustics (geometrical optics)*  *Standing waves and resonance (wave optics)*  *Musical instruments (optical instruments)*  **Disciplinary skills**  *Visualisation of physical phenomena using mathematical techniques*  *Applying knowledge on numerical and practical problems*  **Attitudes**  *Connecting knowledge to everyday life*  *Realizing the identity between mathematical and physical models* |
| **ELECTRICITY**  **AND ELECTRO-**  **MAGNETISM**  **Apr - Jun** | Change | Development  Consequences  Environment | Globalization and sustainability | Development towards globalization based on electricity and elm has deeply changed our lives, having good and bad consequences on ourselves and our sustainable natural and social environment. | A  ii  D  i, ii, iii, iv | **Communication**  *Make inferences and draw conclusions*  **Thinking**  *Practise observing carefully*  *Draw reasonable conclusions and generalizations*  **Research**  *Locate, organize, analyse, evaluate, synthesize and ethically use information from a variety of sources and media* | **Disciplinary knowledge and understanding**  *Electric charge, potential and field*  *Voltage, current and electric circuits*  *Electric energy and power*  *Magnets and magnetic fields*  *Magnetic effect of a current and electromagnetic induction*  *Electric motors and generators*  **Disciplinary skills**  *Applying knowledge on numerical and practical problems*  **Attitudes**  *Connecting knowledge with everyday life*  *Responsibility and integrity* |

**DIFFERENTIATION**

For students with

**dyslexia and dysgraphia**

* bigger font in Sarif, bigger space between rows
* dividing text in tests, practise sheets and instruction papers in smaller sections
* more time for reading, checking if the text/questions are understood
* tolerating writing mistakes
* questions ad space for answers should be on the same page
* allowing longer time for finishing a task if needed
* working in a pair or a team with pears

**ADHD**

* bigger font and space between rows
* shorter paragraphs
* avoiding tables if possible
* frequent checking if a student is concentrated on the work
* instead of complex questions with a, b, c..., separate questions
* questions and enough space for answers should be on the same page
* work in pairs or small teams (up to four)
* creating summary sheets if needed (help lessons)
* encourageing students to participate in class discussions
* commending student on progress
* regurarly making notes about progress in e-dnevnik
* allowing the student to leave the classroom for a short time during the lesson if needed

**Hearing disability**

* facing the student during a lesson as often as possible
* checking understanding of the content
* checking the notes in student's notebook
* providing summaries for a unit or parts of it if needed (help lessons)
* paying attention that the student is not disturbed by a variety of sounds (other students, films, outside noise...)
* work in pairs and small groups

**Hodgkins disesase**

* prolonging deadlines if needed
* providing summaries if needed (help lessons)