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**TSST COURSE AUDIT FORM**

**This form is designed to allow community based panels of teachers to evaluate each other's course, facilitated by the Institute of Physics.**

**Courses which meet the required standard will be deemed to have received IOP-enabled community approval.**

**Evaluators will be primarily looking at consistency between course objectives/outcomes and mode of delivery. The audit form is designed to test the coherence of the course as described. Individual courses may vary in length and it is for individual participants to decide which advertised length suits their needs best.**

**However, based on community feedback, it was felt that it would be helpful to provide some guidance as to specific aspects. Most specific recommendations are given in the Notes columns. In addition it was felt that a TSST course securing IOP approval would normally be expected to take 30-50 hours to complete, excluding unmonitored independent learning time. Please note that a course submitted for auditing will not be penalised if it does not meet a stated guideline. However, the approval panel will expect to see some justification.**

**Institute of Physics will publish details of all community approved courses on the IOP website.**

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| **Name of lead school** | Alexandra Park School |
| **Lead contact** | Henry Hammond |
| **Date submitted** | September 2018 |

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| **Course summary** | **Notes** |
| The course will be run in the Science teacher training lab and ICT suite. The teacher training lab is next to the physics prep room, has full lab facilities and two interactive white board to maximise CPD efficiency and impact. The ICT lab is opposite and will facilitate the use of ICT and edtech activities within the course.  The lead and the school have been a key part of the IoP Capital Physics program, a lead school of a secondary partnership a lead school for STEM learnings London North Science Learning Partnership (SLP) and has been delivering physics CPD for 6 years in these capacities.  The 6-day course covers KS3 & 4 content. Topics covered in depth include energy transfer, electricity, forces and motion, light and waves, electromagnetism, radioactivity and astrophysics. The practical component of the new GCSE specification will also be covered.  A-level content can be covered for those delegates who are ready for further stimulation and challenge.  The course aims to enthuse and inspire participants by;  • improving physics subject knowledge of participants  • increase confidence to support effective practical work to engage learners in physics topics  • develop effective pedagogical approaches to improve pupil learning and progress    This will be suitable for non-specialist teachers and teachers returning to the profession.  The participants will gain a sound understanding of the key concepts of physics. They will have ideas for “hooks” to promote questioning and discussion to lead to a deeper understanding. Common misconceptions (identified from IoP research findings) will be addressed.  Each topic coverage will include demonstrations, core practicals, innovative investigations and an opportunity to practise exam style questions. We will also focus on meeting the mathematical demands of the new curriculum.    Online tutorial support and in-school coaching will be available between sessions. All topics will have dedicated supervised online classroom work with the space module being predominantly online with participants completing presentations, sharing their online (both supervised and independent) work with the rest of the group.  The content will be adapted to individual participant needs to ensure the maximum impact. Resources will be available to participants online to support delivery in the classroom in their home school.  Participants will be presented with a programme completion certificate detailing the modules they have learnt. The expected outcome is for participants to be more confident and enthusiastic in delivering physics GCSE content using a range of pedagogical techniques and a range of practicals. | Short description of the course (e.g. objectives and expected outcomes) |

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| |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  | **Subject area (indicate number of hours)** | | | | | | | **Mode of delivery** | Energy | Motion & Forces | Waves | Electricity & electromagnetism | Matter & Space | Other, if any, specified below: | | Face to Face (Presentations, lectures, guided group tutorial work with tutor present) | 1 | 2.5 | 1 | 2.5 | 1 |  | | Practical (Hands on use of apparatus working individually or small groups. Observation of demonstrations is not deemed to be practical work) | 2 | 3 | 1.5 | 3 | 1.5 |  | | Coaching/ Mentoring (One to one or small group sessions involving coaching, mentoring or allied techniques led by an experienced practitioner.) | 2 | 2 | 1 | 2 | 1.5 |  | | Monitored independent learning (e.g. online tutorial work) | 1 | 1 | 1 | 1 | 3 |  | | Other modes (please specify below) | 0 | 0 | 0 | 0 | 0 |  | | **Total hours** | 6 | 8.5 | 4.5 | 8.5 | 7 | **34.5** |  |  |  | | --- | --- | | **Please provide further *brief* detail on the following aspects of the course** | **Notes** | | **Practical Work** | Specify what nature is – e.g. embedded in related session/standalone/skills focussed, work in pairs/groups. Also include Health and Safety measures in place. | | Demos, ‘hooks’, cognitive conflict practical examples will be embedded in the face to face sessions.  All required practical’s and a range or other class practicals and teacher demonstrations will be trialled by participants in the practical sessions – there will always be 2 course presenters (sometimes more we are a team of 4 physics staff leading the course) available during all practical work allowing differentiation opportunities and one to one coaching. This work will be done in pairs or groups of three.  A range of physics in unfamiliar circumstances practicals will be used in the coaching and monitoring time – these will fit with exam questions and may also be taken from sources such as Keith Gibbs book ‘The new resourceful physics teacher’  We will have a standalone session looking at datalogging. We will have a health and safety session considering HT supply for national grid demos and other higher risk practicals.  All practicals will be CLEAPSS checked and correctly set up with oversight by our RSciTech physics technician. | | **Subject knowledge** | Please give more details on methodology of subject knowledge (e.g. lecture, practice questions, peer tutorial, diagnostic testing) | | For each module there will be;  A brief interactive lecture, shaped by a pre-module diagnostic assessment. Followed by practical sessions as detailed above. This will be followed up by group tasks covering practice tasks and exam questions in a seminar type environment and this will incorporate peer tutorial and small group work to allow participants to practice teaching the relevant content from that module. There will always be a minimum of two facilitators available to deal with individual misconceptions and differentiate tasks. | | **Pedagogical Content Knowledge** | Give further details on methodology used (e.g. pupils, misconceptions/naïve conceptions) | | All of our face to face sessions will allow participants to experience what it is like for the young people they teach. This will include them providing explanations to phenomena, which will be explored further through discussion. They will experience and be taught how to use approaches such as cognitive conflict and metacognitive strategies to develop these ideas further. The use of online testing and AfL during sessions will help facilitators identify pre and misconceptions that are unhelpful and give participants chance to test these fully and revisit these pre and misconceptions, promoting change to a more helpful set of ideas. Handling of PCK will follow guidelines from IOP and other relevant bodies. | | **Research Informed Practice** | How do you propose to embed the results of research informed best practice (e.g. access to research articles) | | We will be using many of the ranking exercises and other physics educational research tools from physport and where possible the American association of physics staff and CLASS. We have the support of James de Winter (leads physics PGCE at Cambridge) both as an Ogden trust Colleague of the lead and as Masters in education supervisor of Jed Marshall one of the key facilitators. We will use physics education research (PER) to structure the course and make all relevant research articles and tasks used available via the online classroom. | | **Handling of Mathematical Requirements** | e.g. handling of graphical techniques, proportionality, errors | | Practical time has been given additional weighting to allow participants time to gather and analyse data in the same way we would expect grade 9 GCSE students to complete, this will allow significant coverage of the graphical and error techniques covered. We have a bank of pure skills lessons that we use with GCSE classes to ensure skills such as rearranging and using equations, understanding proportionally and reading graphs is well embedded early in the GCSE course. These resources will be used as part of the face to face and one to one coaching time where diagnostic assessment shows it would be useful. All of the skills lessons will also be available as part of the monitored online classroom.  Exam question practice will be used to highlight which mathematical skills are required, including questions requiring multiple equations. Prefixes, estimation and dimensionless analysis will also be covered both as standalone skills and embedded in practice questions to ensure participants understand why these skills are beneficial in an exam situation. | | **Participant Assessment Arrangements** | Use of various modes e.g. lesson observation, portfolio, diagnostic testing, etc. | | Participants will keep an ongoing portfolio throughout the course, this will include pre module diagnostic tests exam question practice and participant notes. Portfolios will be discussed with participants during one to one coaching sessions.  All participants will take part in a number of learning walks to see physics GCSE and A-level lessons at APS. Lesson observations in participant schools will also be available.  A range of formative assessment techniques will be modelled throughout the course including, exit questions, use of plickers, targeted questions etc.  IoP and university of York diagnostic testing will be used both pre course (baseline assessment) and before each session – the results of these diagnostic tests will be used to structure each session and guide coaching time. The pre course diagnostic test will be repeated at the end of course to give a summative measure of improvement. | | **Quality Assurance Mechanisms** | Mention use of any form of quality assurance – use of validated material, external validation or accreditation. Please include qualifications of staff. | | IoP resources (TSST and others) will be used. The course lead has a master’s in physics and astrophysics, 2 years science presenter and 12 years of physics teaching experience; he has delivered courses for the Ogden trust and STEM learning he develops CPD as part of the Ogden trust national secondary CPD program. He is a 2018 winner of the south regional STEM Enthuse Awards for CPD. one of the other course leads has an engineering and a biomed degree, 9 years GCSE and A-level physics teaching experience and is the current head of physics, giving heightened knowledge of new GCSE curriculum. Another lead has and a degree in engineering, 2 years classroom practice and in currently undertaking a masters of education focusing on using flip learning in physics education. The final lead has completed his training to become a medical doctor and has since retrained as a physics teacher and has 2 years classroom practice – his enthusiasm for learning new physics is infectious, he also has a passion for building his own practicals.  We are all practicing A-level and GCSE Physics teachers with up-to date knowledge of the new National Curriculum and teaching methods. The range of skills and interests of the facilitators will add depth to the program. | | **Individualisation for Participants** | Mention any separate routes possible, and how those routes are decided. | | We are four facilitators working together to plan, deliver and evaluate this TSST course. There will always be at least two facilitators delivering each session this will allow for differentiation and bespoke support for those looking to extend their knowledge to A-level and for those finding course content challenging. | | **Course Evaluation Mechanism** | Mention evaluation by participants, or external body, if you intend to publish survey results etc. | | An audit at the beginning of the programme will provide a baseline measurement so that a similar audit taken at the end will allow us to measure the level of improvement of participants in their subject knowledge. Tasks are set through the course of the programme and feedback obtained on a regular basis so that progression can also be measured on an on-going basis and appropriate support put in place. Evaluation of the course is ongoing through the use of diagnostic tools as mentioned earlier and evaluations of the face to face sessions.  A mentoring log is to be completed by each participant which validates the support of the school. This is checked by the deputy Head at APS who is in charge of performance and development and runs the teaching school. Participants will be encouraged to apply for external accreditation of their learning via the Science Learning Network 'Effective STEM Teacher' status (or higher). It could also be used support an application for CSciTeach or other similar accreditation. Some participants will be working towards Masters' credits.  As well as having the opportunity to create an ongoing blog as part of the google classroom participants are encouraged to share their teaching experiences in the classroom and feedback on what went well and what didn’t with the group, lead person and other facilitators. This allows continual support to ensure that the participant obtains maximum benefit from attending the sessions and supports delivery of high quality teaching resulting in positive outcomes for students. | | **Lifelong Learning of Participants** | The TSST courses are inevitably of limited duration. Explain how participants are enabled to acquire the skills for autonomous learning beyond the course itself. | | The participants should complete the programme with confidence in their ability to teach the subject and feel motivated and stimulated for continued development.  Participants will be encouraged to become a member of the IoP to be part of the STEM learning physics network and attend its termly meetings. Twitter and email mailouts will be used to inform and direct participants towards future CPD opportunities from the Ogden trust and STEM learning. They will be encouraged to consider joining the Institute of Research in Schools (IRIS) so that they can continue to learn from university researchers alongside their students. | |  |  |  |  |  |  |  |  |