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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** | Fairfax Academy |
| **Lead contact** | Rachel Clarke |
| **Date submitted** | September 2018 |

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| **Course summary** | **Notes** |
| This course is designed to enable teachers of specialisms outside of science, science teachers with a need to develop their Physics knowledge and pedagogy and returning Physics specialists with the knowledge and skills they need to be able to teach confidently up to KS4 / GCSE level. Specifically, it looks to enable safe and confident delivery and appraisal of required practical activities, a solid understanding of the scientific process (particularly for non-science specialists) and the subject knowledge and mathematical skills required to allow them to teach all aspects of KS3 and KS4 Physics.The programme will run over one academic year with a twilight session and one face-to-face day each half term. The twilight sessions will be delivered by subject specialists who are experienced teachers along with colleagues from local universities that provide ITT in this specialism and will focus on the development of understanding of the physical science content along with some ideas and ‘tricks of the trade’ on how to deliver the content. The face-to-face days will focus on lesson planning for the subject to include appropriate pedagogical development and strategies for planning effective lessons. Through team planning a lesson to be taught, common misconceptions will be identified along with strategies for addressing them. The face-to-face days will be delivered by a Physics SLE along with colleagues from the science teams in our alliance schools. The structure for twilight sessions (1x 2 hours per half-term) will be an overview of the specification requirements for the topic in question, followed by discussion of the common misconception areas, how to use terminology and practical work effectively to convey the correct understanding and ways of discussing technical areas, e.g. rearrangement of formulae and discussing forces vs. motion produced or velocity vs acceleration. The general structure for each face-to-face day is that the morning will be spent discussing specification requirements and subject knowledge for that area, in addition to then planning a lesson that will be team-taught in the afternoon to an appropriately selected class. This lesson will then be evaluated.Throughout the entire course, an online VLE will be used to provide supporting materials and a collaborative workspace for all course participants, in addition to being a communication tool for individual support on an as-required basis.At the beginning of the programme participants will sit a baseline test based on the six key elements identified for each subject specialism. A comparable baseline test will be sat at the end of the programme to assess the rigour of learning and subject knowledge. Throughout the programme; twilight sessions will be quality assured by leadership members with appropriate subject specialisms from across the alliance. The subject specialists delivering the twilight sessions will receive feedback and coaching on their delivery and facilitation. When team teaching lessons participants will be observed and monitored by experienced classroom practitioners. Feedback will be provided through personalised coaching and records kept to monitor the level of improvement and key areas for development. The final twilight session of the programme in summer term 2 will give participants the opportunity to evaluate all elements of the course and produce an action plan for the next stages in their development. | 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) | **2 hrs**( 1x 2hr twilights )  | **2 hrs**( 1x 2hr twilights )  | **2 hrs**( 1x 2hr twilights )  | **2 hrs**( 1x 2hr twilights )  | **2 hrs**( 1x 2hr twilights )  | **“Atomic Physics”****2 hrs** (1x 2hr twilight)  |
| Practical (Hands on use of apparatus working individually or small groups. Observation of demonstrations is not deemed to be practical work) | **1 hr** (included in twilight session) | **1 hr** (included in twilight session) | **1 hr** (included in twilight session) | **1 hr** (included in twilight session) | **1 hr** (included in twilight session) | **1 hr** (included in twilight session) |
| Coaching/ Mentoring (One to one or small group sessions involving coaching, mentoring or allied techniques led by an experienced practitioner.) | **2 hrs** (included in face-to-face day)  | **2 hrs** (included in face-to-face day)  | **2 hrs** (included in face-to-face day)  | **2 hrs** (included in face-to-face day)  | **2 hrs** (included in face-to-face day)  | **2 hrs** (included in face-to-face day)  |
| Monitored independent learning (e.g. online tutorial work) | **2 hrs**Online VLE-based work | **2 hrs**Online VLE-based work | **2 hrs**Online VLE-based work | **2 hrs**Online VLE-based work | **2 hrs**Online VLE-based work | **2 hrs**Online VLE-based work |
| Other modes (please specify below) | **1 hr**team teaching**~15 mins** Online VLE-based ad-hoc communication | **1 hr**team teaching**~15 mins** Online VLE-based ad-hoc communication | **1 hr**team teaching**~15 mins** Online VLE-based ad-hoc communication | **1 hr**team teaching**~15 mins** Online VLE-based ad-hoc communication | **1 hr**team teaching**~15 mins** Online VLE-based ad-hoc communication | **1 hr**team teaching**~15 mins** Online VLE-based ad-hoc communication |
| **Total hours = 49.5** | 8.25 | 8.25 | 8.25 | 8.25 | 8.25 | 8.25 |

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| **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.  |
| Practical work will be examined as a support to teaching (e.g. using apparatus for demonstrations and to consolidate learning), in addition to the requirements for the required practicals, as part of the curriculum and new exams. This will be discussed in twilight session, as well as time made available to get hands-on with the equipment to practice what is discussed.Practical sessions will be focusing on four key areas for each undertaken: The safest and most effective way to set up/use the apparatus, what pupils will likely need to know in practical-based examination questions, common mistakes and how to avoid them and the use of specialist equipment (e.g. setting up data loggers and light gates). |
| **Subject knowledge** | Please give more details on methodology of subject knowledge (e.g. lecture, practice questions, peer tutorial, diagnostic testing) |
| General subject knowledge for the participant group will be highly focused upon, with topics that are ‘new’ to the new specification sciences being an area of focus, but covering all areas of understanding. This is intended to be delivered over the course of 3 general hours of face-to-face time (2 on the morning of face-to-face days and 1 in each twilight session), which will split equally across all specification points of knowledge for that topic area. There will then be a further 2 hours total undertaken in a more personalised manner through the use of coaching based on individual knowledge audit responses, this will be undertaken in the middle of the face-to-face days, whilst planning lessons to team-teach off the back of these sessions, immediately putting into practice what has been discussed. This will be assessed by diagnostic testing pre-course, and developed throughout the course through discussion, lecture, VLE-led assignments and then a final assessment made at the end of the course.This component is to be delivered such that every participant can develop at their own pace - Primarily by identifying the areas required in the morning of face-to-face days, assessed by checklist-type knowledge audit sheets and then developed through the use of further reading of the textbook and online materials supplied on the VLE, with questions also available to check ongoing progress. |
| **Pedagogical Content Knowledge** | Give further details on methodology used (e.g. pupils, misconceptions/naïve conceptions) |
| To be developed with a particular focus on common misconceptions found in science lessons, specifically how to identify and then the language that should be used to correct these misconceptions if they are pre-existing, and how to avoid creating these through poor quality verbal explanations. Will follow the specification in terms of content and depth, to allow for exam board independence.This will not be taught as a separate component, but rather embedded in the discussions and work undertaken in both the face-to-face days and the twilight sessions. This is based on the concept that a teacher that knows what they’re doing and how to produce the desired outcomes is totally different (and more ineffective) than a teacher that knows how to show and explain to pupils effectively what to do and how to do it. |
| **Research Informed Practice** | How do you propose to embed the results of research informed best practice (e.g. access to research articles)  |
| The school has access to JSTOR online journal database, where participants will be able to access the latest journal articles related to teaching science as part of a unified STEM approach.Resources that are to be employed and provided to participants through the VLE include a range of materials, for example the York University BEST (Best Evidence Science Teaching) resources and frameworks, which is particularly supportive for KS3 and lower KS4 teaching. The requirement for evidence based teaching is based on the Coldwell et al. July 2017 “Evidence-informed teaching: an evaluation of progress in England” Research report, which will be referenced to at the outset of the course to provide a foundation on which all future sessions are to be based upon. Practical work is to be undertaken in line with Robin Millar’s work on analysing the effectiveness of practical activities, with particular care taken with ensuring the objectives of practical work is as clear as the methods to achieve them. |
| **Handling of Mathematical Requirements** | e.g. handling of graphical techniques, proportionality, errors |
| Particularly to be focused upon for any participants that are not from a STEM based background, this will be taught primarily in line with meeting the required equations (to be learnt, as students will need to) in addition to discussions of scaling units and rearranging the subject of a formula. Practical work will be discussed with regards to interpretation of results, graph  |
| **Participant Assessment Arrangements** | Use of various modes e.g. lesson observation, portfolio, diagnostic testing, etc.  |
| Initial diagnostic testing carried out pre-courseVerbal testing and probing of subject knowledge and articulacy in delivering this knowledge throughout contact timeEvaluation of team-taught lessons that are planned under supervision with SLEs (This is the main aim of the course – to enable effective lessons to be planned and delivered across a wide range of topics).Final evaluation on last face-to-face day, producing an action plan for further development. |
| **Quality Assurance Mechanisms** | Mention use of any form of quality assurance – use of validated material, external validation or accreditation. Please include qualifications of staff.  |
| At the beginning of the programme participants will sit a baseline test based on the six key elements identified for each subject specialism. A comparable baseline test will be sat at the end of the programme to assess the rigour of learning and subject knowledge.  Throughout the programme, twilight sessions will be quality assured by leadership members with appropriate subject specialisms from across the alliance. The subject specialists delivering the twilight sessions will receive feedback and coaching on their delivery and facilitation.  When team teaching lessons participants will be observed and monitored by experienced classroom practitioners. Feedback will be provided through personalised coaching and records kept to monitor the level of improvement and key areas for development.The Physics SLE that will be overseeing the course is the head teacher of the school and holds the following qualifications: BSc Physics with Astrophysics; PGCE Physics with broad balanced Science; MA Educational leadership. Supporting teaching staff hold a minimum of a BSc (hons) qualification in Science as well as PGCE Physics. |
| **Individualisation for Participants** | Mention any separate routes possible, and how those routes are decided. |
| VLE system set up for both collaborative efforts between participants, encouraging a team approach to solving teaching issues; in addition to the ability to chat online 1-to-1 with either an SLE or supporting science staff to have individual answers to pressing issues or support for best practices.This system is designed such that course instructors can make materials available to participants on an ongoing basis, with materials delivered in sequence with the stage of the course that is being undertaken. Participants then have both individualised work areas and collaborative work areas where they can practice their personal subject knowledge against questions that are provided electronically and work collaboratively with other participants on tasks that are set in twilight sessions as self-directed learning. This is expected to account to approximately 2 hours of work between each twilight session.This VLE allows for individuals to upload their own resources to share between participants and has an inbuilt communications platform that allows for direct live messaging access to the course instructors, in the event of a participant having a question about any particular problem. This can take the place of live messaging, voice chat or video chat in both 1-to-1 and group conferencing.Face-to-face days will see participants paired for the purposes of team-teaching, where STEM based participants will be placed with non-STEM based participants to further support their development, under the supervision of an SLE. |
| **Course Evaluation Mechanism** | Mention evaluation by participants, or external body, if you intend to publish survey results etc.  |
| Along with the face-to-face elements of the programme, the participants will be supported with a structured home learning plan that will develop their competence in their subject knowledge aspects. The participants will also have access to a tutor for electronic contact and support. The final twilight session of the programme in summer term 2 will give participants the opportunity to evaluate all elements of the course and produce an action plan for the next stages in their development. |
| **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.  |
| Materials provided on the course to facilitate a basic understanding of the topics required; e.g. a textbook based on the AQA syllabus and access to electronic materials through the VLE. Additionally, the final face-to-face day will culminate in a course review that will generate an action plan for further development, based upon individual strengths and weaknesses identified throughout the course. |

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