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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** | Millais School, Horsham |
| **Lead contact** | Edy Mguni |
| **Date submitted** | September 2018 |

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| **Course summary** | **Notes** |
| The course is a very "hands-on" approach to develop each participant’s confidence in teaching GCSE Physics. The objectives of the course are:* to strengthen participant's own knowledge and understanding of GCSE Physics;
* to further develop participant's practical skills in GCSE Physics;
* to equip participants with the tools necessary to confidently teach the Physics content of the new GCSE Science syllabus.

The expected outcomes are: * participants will have a greater understanding of the concepts covered in GCSE Physics
* be able to apply their knowledge and understanding to confidently answer GCSE Physics questions
* to be equipped to carry out engaging and meaningful practical work with pupils at GCSE level.
 | 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  | 1 | 1 | 1 | 1 | *Building maths skills, unpicking misconceptions-* 1 |
| Practical (Hands on use of apparatus working individually or small groups. Observation of demonstrations is not deemed to be practical work) |  3 | 3  | 3 | 3 | 1 |    |
| Coaching/ Mentoring (One to one or small group sessions involving coaching, mentoring or allied techniques led by an experienced practitioner.) | 2 | 2 | 1 | 2.5 | 2 | 2 |
| Monitored independent learning (e.g. online tutorial work) | 3  | 3 | 3 | 3 | 3 |    |
| Other modes (please specify below) |   |   |   |   |   |    |
| **Total hours** | 9 | 9 | 8 | 9 | 7 | 3 |

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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.  |
| * Each session will provide extensive opportunities for individual and paired practical work, which is designed to develop specific skills and to support the theory work being covered in the session.
* Relevant Health and Safety issues will be dealt with before each practical session and will be documented in the supporting practical handbook. All practical work will emphasise the specific H&S issues that may arise during teaching the topic and would need to be signposted to students before a practical lesson.
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| **Subject knowledge** | Please give more details on methodology of subject knowledge (e.g. lecture, practice questions, peer tutorial, diagnostic testing) |
| * Practical work will play a significant part in all sessions and underpin the specific key knowledge and understanding; the style of delivery will be through experiential ‘hands on’ learning. The methodology will therefore embed and promote both subject knowledge and practical skills. All training will take place in a laboratory.
* Each training day programme will have theory learning using power point presentations to work through subject content. Sessions will focus on a particular area of physics (Energy, Motion & Forces, Waves, Electricity & Magnetism and Matter & Space).
* There will be a focus on subject knowledge in current specifications and the programme will highlight the additional requirements of the new specifications.
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| **Pedagogical Content Knowledge** | Give further details on methodology used (e.g. pupils, misconceptions/naïve conceptions) |
| * At the start of each training day, participants will have carried out a diagnostic test to assess the extent of knowledge and understanding.
* Sessions will focus particularly on progression through the specified physics topics, explaining how to develop pupils’ practical and mathematical skills and how to use models in science. Key knowledge will be delivered ‘lecture style’ and will be followed by discussion of the common misconceptions by pupils and introduce the notion of naïve physics. The discussion will also assess the degree of individual participant’s understanding (and any misconceptions that participants might themselves have),
* Following on from the specialist input of K&U there will be a discussion of the common misconceptions pupils have, based on classroom practice of the experienced course leader,
* The theory part of each training day will be followed by practical work. Experiential learning will allow ‘hands on’ problem solving, enabling participants to appreciate the difficulties that students might encounter. This will be broken down into an initial demonstration by the course leader to reinforce the key learning objectives, followed by either individual or paired work. The practicals have been chosen to maximise and reinforce the key knowledge for the session.
* The two physics specialists will support participants throughout the practical work to maximise individual support and provide personalised ongoing feedback. Participants will have an opportunity to carry out these practicals and through this, any questions that arise will be answered.
* Each session will be evaluated to assess progress and participants will be asked to keep a reflective journal of how they apply their learning in the classroom.
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| **Research Informed Practice** | How do you propose to embed the results of research informed best practice (e.g. access to research articles)  |
| * Tasks and activities will include reference to research articles along with relevant hyperlinks for participants in on-line resources.
* Participants will engage with the Guidance Report from EEF ‘Improving Secondary Science’ and this will be referenced throughout the course, notably the research surrounding preconceptions, modelling, practical work and scientific vocabulary.

<https://educationendowmentfoundation.org.uk/tools/guidance-reports/improving-secondary-science/>  |
| **Handling of Mathematical Requirements** | e.g. handling of graphical techniques, proportionality, errors |
| * The mathematical requirements that arise whilst working through self-study packs will be addressed through the practical workbooks and include graphing, application of formulae, proportionality and error handling.
* Individual specific support for those needing additional help with maths skills will be addressed during the course of the training.
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| **Participant Assessment Arrangements** | Use of various modes e.g. lesson observation, portfolio, diagnostic testing, etc.  |
| * A pre TSST Self Audit form will be completed by all participants and again at the end of the course to show progress.
* At the end of the course participants will present to the rest of the group key areas where they feel that they have made significant improvement.
* Ongoing assessment will be predominantly by working through pre-session exam questions. Time will be allocated at the start of each session to review the tasks set and to work through any problematic areas.
* Lessons observations will be carried out by course leader or the supporting physics teacher to include a specific critique of physics knowledge and suitability of pedagogical techniques chosen to deliver the lesson.
* Participants will complete a Critical Reflection Journal to document progress that they have made which will be shared with the external assessor Dr Brian Marsh (Brighton University).
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| **Quality Assurance Mechanisms** | Mention use of any form of quality assurance – use of validated material, external validation or accreditation. Please include qualifications of staff.  |
| * The materials used were produced by the physics lead for the Millais Teaching School alliance for the first TSST programme (2015/16); these have been reviewed and refined each year. These were initially developed in conjunction with Brighton University with Dr Brian Moore. Over the past 4 years we have worked in collaboration with both Brighton and Sussex University and this year will be quality assured by Brighton University (Dr Brian Marsh – Principal Lecturer, School of Education)..
* Participants will be assessed by a university tutor against QTS subject knowledge criteria at the end of the course. University Lecturer (UoB) will observe sessions and provide feedback to trainers
* The course has been endorsed by the IOP for the past 3 years
* Monitoring of retention

Qualifications of staff* The course leader is Edward Mguni - BSc who has taught Physics for 8 years with Andrew Smith – BSc who has taught physics for 5 years. Both hold leadership posts in their respective schools. Edward Mguni shadowed Rik Clay for the duration of the TSST programme for 2017/18 in order to upskill himself in the delivery of the programme himself, if the opportunity arose.
* Mr Mguni converted from Biology to Physics through a similar course at the start of his teaching career and has a specific understanding of the challenges that participants may encounter, bringing his own experience to the course.
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| **Individualisation for Participants** | Mention any separate routes possible, and how those routes are decided. |
| * The practical handbook will allow participants to work through a range of practicals that may be more applicable to their school situation.
* Based on feedback from previous participants, the programme will continue to use one to one support and coaching during practicals; these were identified as being very useful and supportive.
* Two physics specialists will work with the group at all training sessions providing individualised, specific support and help.
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| **Course Evaluation Mechanism** | Mention evaluation by participants, or external body, if you intend to publish survey results etc.  |
| * At the end of each session, an evaluation form will be completed and an end the course questionnaire will be completed to assess the extent of improvement. Data audit of impact will be taken as follows:
* % course completion
* % summative progress as assessed against initial diagnostic test
* % of teachers teaching physics following completion of the course (2019/20) who were not previously in post as specialist physics teachers,
* Positive progress measures of students from these teachers in 2018/19 (KS3 & GCSE) or 2019/20
* The quality of progress will be measured by a summative online test for physics subject knowledge
* A qualitative measure of the effectiveness of the course will be positive feedback and confidence levels of participants. Participants’ evaluations from previous programmes demonstrated that the course successfully supported the upskilling of science teachers into physics as a specialism.
* Use of Reflective Journals to evaluate the course. Extracts from Reflection Journals from the 2017/18 programme were shared in the TS newsletter (July 2018) ‘*The TSST course has greatly improved my subject knowledge and pedagogy in Physics. I feel more confident in the content I am delivering but also how to deliver it to suit the learners, something I felt unequipped to do outside of my specialism prior to the course. Moreover, the opportunity to reflect on my teaching practice has allowed me to effectively implement the strategies from the TSST course to improve my teaching practice in Physics’. Critical Reflection—Mark Sapwell*
* Evaluations will be published in the TS newsletter.
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| **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.  |
| * At the end of the course there will be the opportunity for participants to be members of an online group / blog where good practice, resources and questions can continue to be shared beyond the course itself.
* Each participant will be given access to online resources to support them beyond the course (annual subscription to the Triple Award Myscience website) for their school’s particular examination board.
* We will disseminate the learning though local and national networks participants will be made aware of ongoing subject network meetings as promoted by The Millais Alliance.
* All members of courses will be expected to share their new knowledge with their departments to enable practice transfer in their schools
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