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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** | Our Lady’s Catholic High School |
| **Lead contact** | Mary Tuson |
| **Date submitted** | September 2018 |

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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) |  4 | 2.5  |  6 |  6 |  5.5 | **2 hours** introductory session to programme – constructivist approach to science education - misconceptions. The work of Karl Popper – thinking scientificallyOptional6hours -Invited to Termly RAE twilights which support application of physics knowledge and understanding within STEM industry. The sessions model how the practical activities can be used within the curriculum or as a STEM club. Delegates are given a class set of resources to take back and use in their school.  |
| Practical (Hands on use of apparatus working individually or small groups. Observation of demonstrations is not deemed to be practical work) |   Hands on practical working in pairs or small groups is incorporated into all twilights and full day sessions. There is a minimum of 33% devoted to this overall in the programme which equates to a minimum of 12 hours in total. The tutors use feedback and discussions with delegates to assess requirements of practical versus demonstration. The numbers below are approximate minimum pair/group practicals. These may increase and therefore hours in row above would decrease/increase depending on delegate need.   |    |
| 1 | 1.5 | 2 | 6 | 1.5 |
| Coaching/ Mentoring (One to one or small group sessions involving coaching, mentoring or allied techniques led by an experienced practitioner.) | 1.6  | 1.6 | 1.6 | 1.6 | 1.6 | Incorporated into the plan is the equivalent of 8 hours of mentoring time via email for week to week support on delivery in the classroom as well as analysis and review of skills audit throughout the year and of performance on online independent learning. The coverage of content is personalised to the delegates’ expertise. Optional 6hours- invitation to Preston STEM network for delegates within the area to meet termly with teachers from KS3-5 and UCLAN lecturers to jointly plan and support maths and physics through STEM skills activities.2 hours - Termly lesson observation and feedback offered by mentors for participants who are already teaching physics as a non- specialist  |
| Monitored independent learning (e.g. online tutorial work) | 2  | 2 | 2 | 2 | 2 |  This is different for individual delegates as the independent learning carried out is planned bespoke from their skills audit. However the total time spent completing background completing kerboodle tasks is equivalent to 10 hours in total between Jan and June  |
| Other modes (please specify below)Shadowing session – observation of CWS (Tutor) as an example of outstanding physics teaching followed by a debrief and discussion session on delivery |   |   |   |   |   |  2 hour activity – topic covered dependent on session and date delegate opts for which fits in with their own school/circumstances.  |
| **Total hours** | 8.6 | 7.6 | 11.6 | 15.6 | 10.6 | 54 + 14 optional |

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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.  |
| The course includes 14, 2 hour face-to-face twilight sessions and 2 full day face-to-face sessions of subject knowledge delivery. These pedagogy sessions incorporate practical activities that have been trialled in the classroom. The sessions are planned in terms of content and scientific skills are incorporated into delivery to model good practice and give further examples of other skills that could be covered and developed in the classroom. Participants generally work in pairs to complete practicals and are provided with resources that will support delivery with students back in their classroom.Where appropriate KS4 required practicals are incorporated and discussion takes place regarding the assessment of these in GCSE exams.All sessions are delivered within a school laboratory environment by Physics teachers and therefore risk assessments are completed as with a routine lesson. As sessions model practical activities in the classroom the tutor makes participants aware of any Health and safety issues that they would be required to monitor in delivery back in the classroom eg voltages to be used etc |
| **Subject knowledge** | Please give more details on methodology of subject knowledge (e.g. lecture, practice questions, peer tutorial, diagnostic testing) |
| Subject knowledge of participants is assessed at 3 points within the course – beginning, middle and end. This is a purpose built physics audit developed by Science Learning Partnership consultant for this purpose.The course includes 14, 2 hour face-to-face twilight sessions and 2 full day face-to-face sessions of subject knowledge delivery. These pedagogy sessions incorporate a range of activities that have been trialled in the classroom. The sessions delivered place participants in the shoes of pupils so they experience the activities themselves. This includes problem solving activities, group work, independent and pair work on exam questions. Learning points and misconceptions are discussed throughout. Participants also plan a presentation in 1 session which they have to deliver to their peers allowing for assessment and identification of any misconceptions. Participants are challenged throughout to dig down to the limit of their own understanding to appreciate how it feels for students who have less than sturdy foundations on which to build their knowledge.  |
| **Pedagogical Content Knowledge** | Give further details on methodology used (e.g. pupils, misconceptions/naïve conceptions) |
| The first session of the programme sets the scene and mode of delivery – constructivist approach to science education (misconceptions) and the work of Karl Popper (thinking scientifically) which is referred to and modelled throughout the programme. All sessions are planned and delivered by the tutor acting as a facilitator to assess prior knowledge and understanding through the activities. The experienced tutors have the ability to react to need dependent on participant response and misconceptions. Participants experience modelling of good practice using roleplay, planning and using analogies as well as plentiful resources for differentiation and challenge to meet the needs of all learners.  |
| **Research Informed Practice** | How do you propose to embed the results of research informed best practice (e.g. access to research articles)  |
| As described above this is partly integrated into the core planning of delivery of the course. In addition tutors use GCSE examiner reports to identify national areas of misconception as evidenced through annual performance in exams.Dependent on content of sessions tutors also provide reference materials or links for further reading.Participants have access to STEM Learning website and newsletter which shares current and up to date research. This will continue to inform practice after the programme ends. Research suggests that partcipants who reflect on learning and action plan in the short, medium and long term demonstrate greater impact on students, staff and organisations and therefore this cycle is modelled in the evaluation process of the course with support from the Impact toolkit from STEM Learning.  |
| **Handling of Mathematical Requirements** | e.g. handling of graphical techniques, proportionality, errors |
| In pedagogy sessions mathematical skills are addressed throughout eg trigonometry in resolution of forces, rearranging formulae, the equation of a straight line. This not only ensures participants have the required mathematical knowledge and understanding to deliver the subject content but can also apply the skills in unfamiliar circumstances. Tutors model effective models of delivery to ensure participants actually understand the maths rather than just have the ability to share the process of calculations with pupils. After evaluations from last year participants requested further support in maths delivery in physics so 2 additional twilights have been introduced this year which concentrate solely on maths skills. These take place in the Spring and Summer term and further build on the subject content and maths covered the previous term to ensure participants already have the content understanding and can focus solely on the mathematical skills particularly the content recently introduced in new GCSE Physics specification.Using the Scientific Model enables participants to understand that the mathematical formulae in the Physics course are just shorthand versions of written relationships between variables. The aim being that participants do not have to learn formulae but by understanding relationships they can derive them. |
| **Participant Assessment Arrangements** | Use of various modes e.g. lesson observation, portfolio, diagnostic testing, etc.  |
| * All participants complete a Subject knowledge Physics audit developed by STEM learning network prior to participation on the course.
* The audit is then used by the mentor to design an online learning programme completed alongside pedagogy sessions via Kerboodle which includes discrete assessment tasks and records participant performance. The mentor monitors this performance and feeds back/ offers support to the participant where necessary for further reading etc Any issues arising are communicated for the tutor to allow for appropriate intervention.
* The audit is updated middle of the programme and the end so that there is a clear tracking of progress by the mentor and the participant can also reflect on their own progress.
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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.  |
| All tutors planning and delivering CPD are very experienced physics specialists.* The Head teacher of the lead school delivers 12 of the twilight sessions
* An associate Facilitator from the Science Learning Partnership delivers 2 full days and offers the shadowing programme. All materials used over the 2 days have been quality assured by STEM Learning.
* An IOP consultant has joined the team for this year to deliver the maths in physics 2 twilights

Quality assurance plans are in place to ensure each tutor is visited once by a subject specialist with experience of planning and leading CPD. |
| **Individualisation for Participants** | Mention any separate routes possible, and how those routes are decided. |
| * The mentor aspect allows for individual independent learning through Kerboodle. The skills audit completed informs the setting of the independent learning tasks and as this is reviewed half way through the course it ensures the tasks set meet the individual needs and take the other learning episodes within the programme into account.
* The individual online mentoring allows an opportunity for free flowing dialogue and support as and when the participant requires it between twilight sessions so that there is always a point of contact to seek support on physics queries that arise during term time.
* The shadowing sessions allow for diversity in timings and subject content as well as 1:1 or 1:2 time for mentoring on personal issues.
* Optional provision is offered for participants who are interested in STEM application and further networking.
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| **Course Evaluation Mechanism** | Mention evaluation by participants, or external body, if you intend to publish survey results etc.  |
| Evaluation takes place in December, March and June. The evaluation asks in particular about which sessions participants found most useful and asks for areas for improvement.CPD delivered by external tutors from Science Learning Partnership complete evaluations after each session and these are fed back to us to inform planning. For example last year participants expressed the need for additional cpd to support their knowledge and understanding of the maths content in the new GCSE specifications. Therefore 2 extra twilights have been embedded this year.All participants said that the course structure and twilight approach with directed independent learning with mentor support suited their needs and circumstances. The final evaluation of 1 participant is below“The quality of the training on this course has been fantastic. The use of practical activities has enabled me to access the content and in turn, relate this to my planning for lessons. I have felt supported and nurtured throughout the course and there have been lots of opportunities for further discussion and enhancement. The depth of explanation and the style of teaching has sparked enquiry and utilised problem solving skills. Without this course, I most certainly would not have built up the confidence I have now in teaching certain aspects of the Physics curriculum. I am able to plan more engaging and appropriate activities to support teaching and learning and feel more secure in my own knowledge when teaching. It has given me a renewed interest in the subject, which I would hope to pass on to my pupils.” |
| **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.  |
| * Course documents provide reference materials which support the participants throughout the course and can be referred to in the future.
* Through the mentoring programme participants are supported with areas of misconception and directed to appropriate sources online for support which can then be used in their further practice.
* Collaboration with the Science Learning Partnership ensures participants have access to the STEM learning website and all of the resources available. The participants have the opportunity to join the STEM Learning distribution list and will therefore receive regular emails with information about future CPD/ research etc to support further development.
* Dave Cotton from the IOP delivers 2 of the twilight sessions which focus on maths skills required in the new GCSE specifications. As part of the session Dave showcases the support and resources available from IOP.
* This course enables delegates to obtain 20 credits towards an MA Education Professional Practice, negotiated learning University of Cumbria. This is achieved by writing up their experience and reflecting on the impact. This provides a further opportunity to consolidate learning.
* Attendance on the programme enables participants to apply for the STEM educators award in association with STEM Learning which recognises and rewards participants CPD involvement. This accreditation lasts for a year and ensures they are eligible for Enthuse awards.
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