

BLENDED LEARNING GUIDANCE

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the place of useful learning

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Document History

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1.0	02 July 2020	HLR	First approved version
1.1	23 July 2020	HLR	Added link to 1 in section “Mode of delivery: Lecture”
1.2	16 September 2020	HLR	Changed “Ensure your students” to “Encourage your students” in “Mode of delivery: Lecture – Suggested Approaches”
1.3	26 July 2021	HLR	Updated to reflect continuation of campus restrictions for 2021/2022.

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Introduction

This document outlines the guidance provided for undertaking undergraduate, postgraduate and non-credit bearing teaching under the circumstances of the 2020 Coronavirus pandemic, where the normal capacity of the campus to support teaching and learning is interrupted.

Definitions

1. Face-to-Face Teaching/Learning

Teaching that is delivered largely according to the traditional method with in-class teaching. In this method of teaching and learning, an online platform such as Myplace may provide some support, it is not a primary tool for student learning activity.

2. Emergency Remote/Pivoted Online Learning

This is typically campus teaching through other means, as seen in the measures taken at short notice to continue teaching after the introduction of campus restrictions from 16 March 2020. Direct alternatives were sought for campus-based activity, in many cases without classes being significantly redesigned or redeveloped. For example, scheduled lectures were conducted through platforms such as Zoom, usually at the time previously scheduled for the face-to-face class. Tutorials and seminars were carried out similarly. Where teaching, learning or assessment activities could not be conducted in their planned manner, alternatives were provided in an agile manner which met learning outcomes and academic requirements.

3. Planned Online Learning

Planned Online Learning is teaching which is planned and developed over an extended timeframe, and quality assured before delivery. The planning process is sophisticated, engaging specialists (academic teams, learning technologists, videographers, project managers) from across the campus to ensure high quality online modules, delivered to a schedule. Examples include Graduate/Degree Apprenticeship programmes, fully online PGT/UG programmes and Massive Open Online Courses (MOOCs).

4. Blended Learning

Blended learning combines aspects of Face-to-Face Learning and Planned Online Learning. Aspects of Face-to-Face Learning which are most useful to student learning or cannot be run to the same level of efficacy online are maintained. Activities which can be conducted online to the same or greater efficacy, are used in tandem with Face-to-Face activities. This mode requires the planning aspects of Planned Online Learning to ensure a robust student learning path is provided.

Where Blended Learning is adopted, this will consider aspects of campus teaching that cannot otherwise be delivered to the same standard. This may require

- Face-to-face campus teaching, either whole-class or group activities, aspects of which may be modified in the form of a Flipped Classroom (see below).
- Mixed-delivery teaching where face-to-face aspects are simultaneously provided online e.g. live lecture also streamed online e.g. via Zoom.
- On-campus practical and laboratory teaching, where this cannot adequately be provided through other means.

- Online practical and laboratory teaching e.g. normally held in PC labs where this can instead be provided effectively online (see PC Laboratory work below).

Academic Year 2021-2022

At the start of semester 1 of 2021-2022 requirements will still be in place to exercise social distancing, limiting the level of on-campus synchronous learning activities. Further,

1. Modules which were based on Face-to-Face Teaching/Learning in previous academic years will require adjustment to accommodate the required safety measures such as social distancing.
2. It is recognised that the new academic year, which will include new groups of learners, will require a planned and structured approach to teaching development and delivery.
3. Entire adoption of Planned Online Learning is unlikely to be possible due to the resource, staff development, and time implications. In addition, aspects of many modules have a requirement for on-campus activity e.g. laboratory work, which cannot be replicated entirely online.

Blended Learning – Expectations

Blended Learning good practice, where possible and appropriate, should provide

1. A learning experience of equivalent quality to that of Face-to-Face teaching
2. Greater flexibility¹ of learning in terms of place and time for students
3. Greater flexibility of place and time for staff when supporting students' learning

¹ In December 2015, the Learning Enhancement Committee approved the University's "Principles of Flexibility":

High quality flexible learning should, where appropriate,

1. Provide opportunities for learners to engage:
 - a. outside normal schedules and timescales
 - b. at any distance from campus
 - c. in effective and non-traditional modes of learning
 - d. in diverse high-quality learner journeys
2. Widen participation by taking advantage of effective pedagogies and technologies
3. Allow learners to seek recognition of prior learning and experience
4. Provide opportunities to meet accepted academic standards through alternative means
5. Maximise flexibility within the curriculum

(<https://moss.strath.ac.uk/corpservices/committees/LEC/15-16/Document%20Library/3/LEC%208%20Dec%202015%20-%20Paper%20B%20-%20Draft%20Strategic%20Vision%20for%20Technology%20Enhanced%20Learning.pdf>)

Good Practice in Blended Learning

Depending on restrictions on use of the campus, consider maximising the benefit from any time which is spent on campus. Consider what learning outcomes can only be achieved face-to-face and what can be achieved with the same thoroughness through other means. Student engagement requires to be planned, not just in delivering the technical material but also opportunities for students to liaise together and for access to academics and support staff. Consider if your students would benefit from a short session to get to know their lecturer and fellow students.

While switching to a Blended Learning approach to deliver of a module will provide students with greater flexibility, this will require greater/alternative preparatory work on the part of those teaching the module, and detailed consideration of the module learning outcomes.

It is suggested that the reasons for teaching choices are articulated to students in advance, and at the beginning of modules and/or activities, with the explanation of teaching choices made in terms of consistency of quality, flexibility and safety. Any changes during delivery should be communicated promptly with explanation to the students. This will assist in managing student expectations.

Planning Blended Learning

An effective Blended Learning module requires planning and preparation in advance of the delivery of the sessions. An outline of a week of your module can, for example, be broken down into a written planner (Appendix 1) to identify ways in which your module can be adapted. This allows the identification of activities which can be restructured to provide greater flexibility on the part of the students, academic staff, or both. If your classroom will be flipped, or benefit from flipped activities, this can allow a class structure to be articulated to students.

A flipped approach has been used very successfully in programmes such as the Graduate Apprenticeships (see Flipped Classroom below).

The following staff development sessions are available:

- For a general overview: **Planning Blended Learning:**
<https://bookings.strath.ac.uk/Home/Course/5475>
- For programme leaders: **Blended/Online Course Design for Programme Leaders:**
<https://bookings.strath.ac.uk/Home/Course/5471>
- The SPARK class **Course ReDesign:**
<https://bookings.strath.ac.uk/Home/Course/5438>
- **Blended and Online Learning and Teaching Drop-In Sessions** – sessions designed to allow staff to drop-in to seek advice on any aspect of learning and teaching using blended and online learning:
<https://bookings.strath.ac.uk/Home/Course/5472>

Modes of Delivery: Adapting for Online and Blended Learning

Mode of delivery: Lecture	
Considerations	Suggested Approaches
<p>If lecturing is core to your teaching, consider how much live engagement you typically have with students during a lecture. If your lectures require little or no live engagement with students, consider if there is more benefit from running them face-to-face, or from providing them live through a platform such as Zoom. Greater flexibility might be provided to both your students and academic staff through making recordings, perhaps of shorter sections, available for them to follow. Scheduled contact time with a class may be usefully spent on aspects other than direct instruction. A prominent model for this mode of teaching is the “Flipped Classroom” (King, 1993) (see below).</p>	<ol style="list-style-type: none"> <p>1. On-campus attendance and delivery of lecture considered practical Students engage live, in-class. In addition, engagement is supported in a structured Myplace forum activity. Avoid forums of the type “Post any questions here” as students are often reluctant to post to such forums without the structure of recommended activity. Directive language in the forum introduction is suggested such as “Each student should suggest a concept from the module that they feel confident about, and one which they feel they need to consider more deeply”.</p> <p>2. On-campus attendance and delivery of lecture considered impractical Lecture is recorded in advance. Consider recording in segments of 15-20 minutes. This may be less exhausting to produce and also is likely to be more accessible to students (Bligh, 1972). Provide students with a structured Myplace forum as outlined in approach 1 above.</p> <p>Use video to present the academic in addition to the visuals (slides etc.) that support the session. This increases Teaching Presence (Garrison, Anderson, & Archer, 1999) and provides a focus for the students. This may be done when introducing the recorded segment, throughout, or at key points in the recording. Avoid displaying large amounts of text on-screen if these are simply read out.</p>

If Zoom is used for teaching, it is strongly recommended that this is done through the adding of a Zoom Myplace (Moodle) activity, in preference to circulating a Zoom meeting link. Using the Myplace activity allows the session to be identified as a teaching session to inform learning analytics.

Encourage your students to turn on video. This will make it easier for the academic who then is not simply speaking into their own slides. Note that, depending on their location, some students may feel unable, or that it is inappropriate for them, to turn on video.

Depending on the number of students in the session, you may prefer to mute your students' audio before they enter to avoid background noise interference.

High quality captions and transcripts for any pre-recorded material are required when these are to be viewed by someone with a disability that would need them. When captioning and/or provision of captions is critical, this requires immediate provision. [Guidance on the creation and provision of transcriptions and captions is available.](#)

Guidance/Training

- Guidance on **using Zoom** in teaching is available: <https://support.myplace.strath.ac.uk/display/MS/Academic+Continuity+Guidance> (see "Live Teaching")
- Guidance on the **recording** of Zoom teaching sessions is available: <https://support.myplace.strath.ac.uk/display/MS/Academic+Continuity+Guidance?preview=/112230420/140083245/Guidelines%20on%20the%20recording%20of%20Zoom%20teaching%20sessions.pdf>
- Guidance on the creation and provision of transcriptions and captions is available: <https://support.myplace.strath.ac.uk/download/attachments/112230420/Transcriptions%20and%20Captions%20Guidance.pdf>



- A staff development session “**Teaching with Zoom**” is available: <https://bookings.strath.ac.uk/Home/Course/5392>
- Guidance on **self-recording** is available: <https://support.myplace.strath.ac.uk/display/MS/Academic+Continuity+Guidance> (“Pre-recorded Teaching”)
- A staff development session on self-recording “**Studio in Your Pocket**” is available: <https://bookings.strath.ac.uk/Home/Course/2298>
- A staff development session “**Success on Screen**” is available: <https://bookings.strath.ac.uk/Home/Course/4123>
- The **STEPTech resource** contains a number of short blog posts on using technology to support learning and teaching and is designed to spark ideas and support innovation: <https://moss.strath.ac.uk/developmentandtraining/resourcecentre/STEP/STEPTechBlog/default.aspx>
- The **STEPTech mailing list** is for staff involved in teaching to pose questions, share experiences, highlight good practice, and reflect on challenges of using technology to deliver teaching learning, assessment and feedback: <https://www.jiscmail.ac.uk/cgi-bin/webadmin?SUBED1=STEPTECH&A=1>

Mode of delivery: Small Group Teaching e.g. Seminars, Tutorials

Considerations	Suggested Approaches
<p>Small group teaching in a seminar or tutorial is key to many disciplines. If the circumstances are such that some groups are required to work entirely virtually, entirely face-to-face, or a mix of these modes, this opportunity must be provided equitably and to the same standard across modes.</p>	<ol style="list-style-type: none"> 1. On-campus attendance and provision of Small Group Teaching considered practical Certain disciplines may require the use of campus spaces for physical group activities to take place. Students engage live, in-class. 2. On-campus attendance and provision of Small Group Teaching considered impractical If the seminar or tutorial can be conducted equally effectively online, consider if conducting it online will provide greater flexibility to students. If online group work is suitable for teaching or assessment needs, this

can be achieved highly successfully for a range of disciplines using a range of tools such as Zoom, Skype for Business, telephone and Myplace. Note that *all registered students will have a full Zoom licence, with the same permissions and ability as staff* to set up and run Zoom sessions through <http://strath.zoom.com> .

While such sessions may be recorded for student reference, or for use by absent students, consider if this is appropriate for the subject of the session, or whether it may inhibit student participation. [Guidance is available](#) on when recording may be appropriate.

Students working in groups in an online or blended mode may require additional support to make initial contacts and to understand the requirement to work together effectively. Using peer review or peer assessment can be helpful in understanding how groups are performing. Myplace provides tools for peer assessment and/or review. If these are to be used, it is recommended that students are made aware of this at the commencement of any peer reviewed activity. The Management Development Programme in Strathclyde Business School has successfully used online Peer Review to inform staff about the dynamics of groups engaged in group tasks. This has provided additional information when considering assessment of these tasks. Peer review [has also been used to good effect in Psychology](#) in the support of large classes.

Where online groupwork is to be assessed, it is strongly advised that students are provided with a non-assessed opportunity to use the same format of task in advance, using the same technology as the assessed groupwork.

Guidance/Training

- Guidance on **using Zoom** in teaching is available: <https://support.myplace.strath.ac.uk/display/MS/Academic+Continuity+Guidance> (see “Live Teaching”)
- Guidance on the **recording** of Zoom teaching sessions is available: <https://support.myplace.strath.ac.uk/display/MS/Academic+Continuity+Guidance?preview=/112230420/140083245/Guidelines%20on%20the%20recording%20of%20Zoom%20teaching%20sessions.pdf>
- A staff development session “**Teaching with Zoom**” is available: <https://bookings.strath.ac.uk/Home/Course/5392>
- Guidance on **self-recording** is available: <https://support.myplace.strath.ac.uk/display/MS/Academic+Continuity+Guidance> (see “Pre-recorded Teaching”)
- Guidance is in development outlining approaches and quality aspirations for self-recorded audio and video.
- A staff development session on self-recording “**Studio in Your Pocket**” is available: <https://bookings.strath.ac.uk/Home/Course/2298>
- A staff development session “**Success on Screen**” is available: <https://bookings.strath.ac.uk/Home/Course/4123>
- The **STEPTech resource** contains a number of short blog posts on using technology to support learning and teaching and is designed to spark ideas and support innovation: <https://moss.strath.ac.uk/developmentandtraining/resourcecentre/STEP/STEPTechBlog/default.aspx>
- The **STEPTech mailing list** is for staff involved in teaching to pose questions, share experiences, highlight good practice, and reflect on challenges of using technology to deliver teaching learning, assessment and feedback: <https://www.jiscmail.ac.uk/cgi-bin/webadmin?SUBED1=STEPTECH&A=1>

Mode of delivery: Non PC-Laboratory work e.g. Engineering, Physical Sciences

Considerations	Suggested Approaches
Consider what aspects of laboratory work and assessment can reasonably be replaced with equivalent activities of self-study off-campus or online.	Consider if there is essential laboratory work that features aspects of demonstration and if these aspects can be filmed by a Faculty video team. If sufficient quality can be achieved, this may be carried out by the member of academic staff, should it be safe to do so. For example, in 2019, SIPBS

	<p>considered the cost and logistics of one student lab dissection exercise to be too high. A single sample was ordered for dissection, and the process was filmed by Education Enhancement videographers from multiple angles, with voice-over added.</p> <p>Heriot Watt University has produced a short guide “Practice-Based Activities: Labs, Studios & Fieldwork” to provides advice and links to resources to help to develop online and blended alternatives to labs, studios and fieldwork (https://lta.hw.ac.uk/wp-content/uploads/03_RBL_Practice-based-activities.pdf).</p>
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<p>Mode of delivery: PC Laboratory work</p>	
<p>Considerations</p>	<p>Suggested Approaches</p>
<p>Consider what advantages there are from being co-located in a lab with students. Zoom allows students to screen-share their PC desktop in an online session.</p>	<ol style="list-style-type: none"> 1. On-campus attendance and provision of PC laboratory work considered practical Consider if a lab session can be held simultaneously face-to-face and online for those students unable to come to the campus. This may work well if lab tasks are individual. Group tasks will require greater classroom planning and management to ensure equity amongst participants. 2. On-campus attendance and provision of PC laboratory work considered impractical Tutor demonstration of software can be provided on a scheduled or recorded basis using tools such as Zoom, and desktop sharing. If, in addition to the module lead, additional staff support these lab sessions,

individual students can be taken into “break-out rooms” if issues occur, without the session being paused.













Where access to specialist software is required, and this has previously been used in on-campus labs, from June 2020 Information Services are introducing a virtual cloud-hosted desktop environment (Azure) which replicates and extends the services that are available on on-campus PC labs. Using this system, students can connect from any modern web browser on a Windows PC, Mac, iPad or Chromebook and access specialist software from their own devices, which then runs within the browser. As some software applications also take advantage of GPU acceleration, the performance of this virtual PC may be higher than that of the standard lab PC. Further details are available from lab-software@strath.ac.uk.

Guidance/Training

- Guidance on **using Zoom** in teaching is available: <https://support.myplace.strath.ac.uk/display/MS/Academic+Continuity+Guidance> (see “Live Teaching”)
- Guidance on the **recording** of Zoom teaching sessions is available: <https://support.myplace.strath.ac.uk/display/MS/Academic+Continuity+Guidance?preview=/112230420/140083245/Guidelines%20on%20the%20recording%20of%20Zoom%20teaching%20sessions.pdf>
- A staff development session “**Teaching with Zoom**” is available: <https://bookings.strath.ac.uk/Home/Course/5392>
- Guidance on **self-recording** is available: <https://support.myplace.strath.ac.uk/display/MS/Academic+Continuity+Guidance> (see “Pre-recorded Teaching”)
- A staff development session on self-recording “**Studio in Your Pocket**” is available: <https://bookings.strath.ac.uk/Home/Course/2298>



Mode of delivery: Flipped Classroom	
Considerations	Suggested Approaches
<p>The Flipped Classroom has seen an increase in popularity in the past decade. A classroom is “flipped” when</p> <p><i>“lecture or workshop style activities are replaced with online material – whether media clip or other engaging content – and this is developed through either traditional seminars or some form of computer-mediated discussion or assessment.”</i> (Gordon, 2014, p. 10)</p>	<p>Flexibility is afforded to students and staff through the requirement that students prepare themselves adequately before any synchronous seminar (face-to-face or online) through the online material and activities. It may be that an adjustment to “classroom” management techniques are required for some cohorts to ensure that this work is completed in advance.</p> <p>The following example is from EO102 Design and Production, a class in the BEng (Hons) Engineering: Design & Manufacture Graduate Apprenticeship (Figure 1). This example structures activity that can be undertaken online in advance of on-campus activity. Online activity commences with student discussion, continuing with short pre-recorded video lectures on discrete subjects. An individual student activity is followed by discursive reflection on the activity. These online activities serve as preparatory work for a subsequent on-campus workshop that could not be satisfactorily carried out online.</p>

	<div data-bbox="1137 399 1966 1093" style="border: 1px solid gray; padding: 10px;"> <p>Concept Generation</p> <ul style="list-style-type: none">  5.2: Discussion: Previous Experience (5 minutes)  5.3: Lecture: Introduction to Concept Generation and Terms (2:24)  5.3 Lecture PowerPoint Slides 5MB Powerpoint 2007 presentation  5.4: Discussion: Other Concept Generation Methods (10 minutes)  5.5: Lecture: Rules of Brainstorming (2:31)  5.5 Lecture PowerPoint Slides  5.6: Lecture: One of the Ways of doing Brainstorming and Applications (5:07)  5.6 Lecture PowerPoint Slides 1.9MB Powerpoint 2007 presentation  5.7: Individual Activity (Brainstorming) (30 minutes)  5.8: Discussion: Reflection on Brainstorming (5 minutes) <hr/> <p>You need to complete Tasks 5.7 & 5.8 before you come to the on-campus day in Week 6. Sketch your ideas on Post-its and bring them with you to the next on-campus day.</p> <hr/> <p>The next 2 tasks will be carried out during the on-campus day in Week 6.</p> <hr/> <ul style="list-style-type: none">  5.9: Task: Face-to-face workshop (90 minutes, on campus)  5.10: Discussion: Reflection on Brainstorming (10 minutes) </div> <p style="text-align: center;">Figure 1: EO102 – Example Staged Blended Activity</p>
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- Guidance/Training**
- A staff development session “**Flip Your Classroom**” is available: <https://bookings.strath.ac.uk/Home/Course/350>
 - Teaching and Learning Online is available: <https://bookings.strath.ac.uk/Home/Course/1161>
 - Getting Started with Myplace Online is available: <https://bookings.strath.ac.uk/Home/Course/5435>

Additional Resources

Advance HE Essential Frameworks for Enhancing Student Success: Flexible Learning
<https://www.advance-he.ac.uk/knowledge-hub/essential-frameworks-enhancing-student-success-flexible-learning>

Faculty of the Humanities and Social Sciences for the use of their Faculty Pivot Guide
https://moss.strath.ac.uk/hass/support/IT/TEL/SitePages/Pivot_Guide.aspx (accessible to HaSS staff)

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The Difference Between Emergency Remote Teaching and Online Learning. Retrieved from
<https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning>

Practice-Based Activities: Labs, Studios and Fieldwork. (2020). *Responsive Blended Learning*. https://lta.hw.ac.uk/wp-content/uploads/03_RBL_Practice-based-activities.pdf

QAA Scotland (also included in the QAA UK resources)
<https://www.qaa.ac.uk/scotland/en/focus-on/technology-enhanced-learning/getting-your-teaching-online>

QAA Covid-19 Guidance: Preserving Quality and Standards Through a Time of Rapid Change: UK Higher Education in 2020-21 (pdf)
<https://www.qaa.ac.uk/docs/qaa/guidance/preserving-quality-and-standards-through-a-time-of-rapid-change.pdf>

University of Huddersfield Blended Learning Content Generation: A Guide for Busy Academics; Richard Hill (pdf) <https://128.84.21.199/pdf/2006.03730.pdf>

University of Strathclyde Guidance on Providing Feedback To Large Classes (pdf)
https://www.strath.ac.uk/media/ps/cs/gmap/academicaffairs/policies/Guidance_on_providing_feedback_to_large_class_sizes.pdf

References

- Bligh, D. A. (1972). *What's the use of lectures?* : Harmondsworth, Penguin.
- Garrison, D. R., Anderson, T., & Archer, W. (1999). Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education. *The Internet and Higher Education*, 2(2-3), 87-105. doi:10.1016/s1096-7516(00)00016-6
- Gordon, N. (2014). *Flexible Pedagogies: technology*. Retrieved from
- King, A. (1993). From Sage on the Stage to Guide on the Side. *College Teaching*, 41(1), 30-35. doi:10.1080/87567555.1993.9926781

Thank you to Dr Hilary Grierson, Dr Avril Thomson and Dr Robert Hamilton for permission for the use and adaptation of their planning materials. Thank you also to the Faculty of the Humanities and Social Sciences for the use of their Faculty Pivot Guide.

Appendix 1 – Example Weekly Planner for Blended Learning

Key:

Lecture	Discussion	Tutorial	Article	Worked Example	Assignment	Video	Multiple choice	Practical Laboratory
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	Ref	Name	Type	Style	Purpose	Participant Time (mins)	Tutor Notes	Running Total (mins)
Outline	1.1	Lecture 1.1: Class outline	Video	Talking Head Intro	Course overview- Mechanics and Thermo, Openstax and Thermo textbook : refer to ref 1.2	5	Ask videographers for advice on format	5
	1.2	Article: Class content	Reading	Textbook	Coursebook introductory theory	60	Available as ebook in library	65
	1.3	Discussion	Discussion	Forum	Participants asked what is your knowledge of Mechanics/Thermo	10	Make a note of any key contributions for end of week tutorial.	75
Introduction	1.4	Lecture 1.2 Introduction	Short video lecture	Talking head/ Power point	Mini piece to camera lasting no more than 8-10 minutes introducing this week's topic ie kinetics/motion disp/velocity/speed	10	See (Kinematics1 sess 2 16132(motion 1 sess 2 16215), Students given guidance on what to look for while watching ie what is coming up, questions etc	85
	1.5	Article: Textbook	Article	Text/Openstax	Article outlining the theory behind ref 1.4	5	c400 words. I'll draft this as a reminder.	90
	1.6	PRS 2 questions	Online quiz	Myplace multiple choice poll	Test conceptual understanding of position/distance etc	5	PRS Questions 1a 1b (Give typical response histograms of student answers?) NB questions used last year using PRS system.	95

	1.7	Discussion	Discussion	Forum	Participants have opportunity to ask questions regarding ref 1.5 and 1.6	10	Note issues for review during tutorial at end of the week	105
Instantaneous Velocity	1.8	Lecture 1.3 Instantaneous Velocity	Short video lecture	Talking head/ Power point	Mini piece to camera lasting no more than 8-10 minutes instantaneous velocity	10	See (Kinematics1 sess2 16132) (motion 1 sess 2 16215)	115
	1.9	PRS 2 questions	Online quiz	Myplace multiple choice poll	Test conceptual understanding of instantaneous velocity	5	PRS Questions 1c 1d (Give typical response histograms of student answers?)	120
	1.10	Article 1: Textbook	Article	Text/Openstax	Article outlining the theory behind ref 1.8	5	To be drafted - assuming c 400 words.	125
	1.11	Discussion	Discussion	Forum	Participants have opportunity to ask questions regarding ref 1.9 and 10	10	Note issues for review during tutorial at end of the week	135
Acceleration	1.12	Lecture 1.4a Instantaneous Accel	Short video lecture	Talking head/Power point	Mini piece to camera lasting no more than 8-10 minutes acceleration / instantaneous acceleration	10	See (Kinematics1 sess 2 16132)	145
	1.13	PRS 2 questions	Online quiz	Myplace multiple choice poll	Test conceptual understanding of acceleration	5	PRS Questions 1e 1f (Give typical response histograms of student answers?)	150
	1.14	Article: Textbook	Article	Text/Openstax	Article outlining the theory behind ref 1.12	5	c400 words.	155
	1.15	Discussion	Discussion	Forum	Students should post one point they have found difficult, one they have a greater understanding of.	10	Note issues for review during tutorial at end of the week	165
One Dimensional	1.16	Lecture 1.4b 1D Kinematics	Short video lecture	Talking head/Power point	Mini piece to camera lasting no more than 8-10 minutes kinematics motion in 1D ($v = u + at$)	10	See (Kinematics1 sess 2 16132)	175

	1.17	Article: Textbook	Article	Text/Openstax	Article outlining the theory behind ref 1.16	5	c400 words.	180
	1.18	Discussion	Discussion	Forum	Participants have opportunity to ask questions regarding ref 1.16, 1.17	10	Note issues for review during tutorial at end of the week	190
Structured Problem Solving for 1 Dimensional Kinematics	1.19	Lecture 1.5 Structured Problem solving	Video/camtasia	Talking head/PP	Mini piece to camera lasting no more than 8-10 minutes : Structured Problem solving	10	See (Kinematics1 sess 2 16132	200
	1.20	Article: Textbook	Article	Text/Openstax	Article outlining the theory behind ref 1.19	5	c400 words.	205
	1.21	Movie Clip	video	video	Film clip of stuntman outrunning explosion - is it realistic?	5	online resource: True Lies (YouTube)	210
	1.22	Worked example 1.1a: Pictorial stuntman	Zoom self-recorded video	Video of solution using tablet and stylus	Demonstrate pictorial representation of problem	10	Demonstrate application of problem solving framework to "real world" movie example of stuntman out running explosion	220
	1.23	Worked example 1.1b: Conceptual stuntman	Zoom self-recorded video	Video of solution using tablet and stylus	Demonstrate conceptual representation of problem	5	Demonstrate application of problem solving framework to "real world" movie example of stuntman out running explosion	225
	1.24	Worked example 1.1c: mathematical stuntman	Zoom self-recorded video	Video of solution using tablet and stylus	Demonstrate mathematical representation of problem	10	Demonstrate application of problem solving framework to "real world" movie example of stuntman out running explosion	235
	1.25	Article : Worked example	Article	Scanned solution from ref 1.16-1.18	Demonstrate application of problem solving framework	5	c400 words.	240
	1.26	Class Practical	Laboratory Test	Practical	Measurement of Velocity and Accelerations in test conditions	60	Student record measurements using laser equipment	300
	1.27	Tutorial 1: One Dimensional Kinematics	Article	Text	Tutorial problems related to One Dimensional Kinematics	120	students should spend 1-2 Hours attempting solution of problems	360
	1.28	Discussion : Tutorial 1	Discussion	Forum	Students post a question each regarding this week's classes.	15	Students need reminded of this at the start of the week	375

Live Sessions	1.29	Discussion: Weekly interactive tutorial	Zoom	Tutorial	In seminar, students asked to discuss and volunteer responses to their peers' questions.	60	Emphasise preparation required by students	435
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