SBOS Proposal Summary paper.

Reasons for move of programmes

- EPCC separated from School of Physics and Astronomy in August 2016, becoming a Centre of Excellence within the College of Science and Engineering.
- EPCC's MSc programmes in High Performance Computing and High Performance Computing with Data Science remained under governance of School of Physics and Astronomy for 2016/17 and 2017/18 as the programmes and courses must remain under the governance of a School. This made sense due to the co-location in JCMB, their familiarity with the programmes, historical ties, and EPCC's use of the Computational Physics lab for teaching most practical classes. EPCC took over day-to-day administration of the programmes and courses, no longer utilising PTO.
- EPCC is relocating to Bayes in Central Area in Summer 2018, thus many of the previous reasons are no longer valid. Governance moving to Informatics and the Central Area campus makes more sense. This has been agreed in principle by College and Academic Services.
- EPCC's MSc programmes and courses have more in common with Informatics than Physics and EPCC already collaborates with Informatics through PPar.

Programmes:

High Performance Computing:

1 year MSc full-time: PTMSCHPCMP1F
2 year MSc part-time: Code does not currently exist due to previous oversight.
3-year MSc part-time: PTMSCHPCMP3P
PG Diploma 9 month full-time: PTPGDHPCMP1F

High Performance Computing with Data Science:

1 year MSc full-time: PTMSCHPCDS1F
2 year MSc part-time: PTMSCHPCDS1P
3 year MSc part-time: PTMSCHPCDS2P

Changes to programmes:

- Overall DPT changes:
    - Reduction of 'wildcard' optional course choices to 10 credits (compensated for by naming lists of specified optional courses).
    - Addition of Design and Analysis of Parallel Algorithms to HPC Core course choices (and reduction by 10 credits of 'outside' courses in both programmes as a result as 10 credits of that was always intended to be DAPA.
    - Removal of HPC Ecosystem course (compulsory for HPC, optional for HP with Data Science)
- High Performance Computing DPT alterations:
    - addition of Compiler Optimisation and Extreme Computing as 'named' optional courses in 0-20 optional credits list,
    - move of EPCC Data Science courses (Fundamentals of Data Management and Data Analytics with High Performance Computing) to 0-20 optional credit lists – reflecting their status as optional courses rather than core HPC options.
- High Performance Computing with Data Science DPT Alterations:
    - Addition of named optional Data Science courses (0-30 credits list): Machine Learning Practical, Extreme Computing, Image and Vision Computing, Text Technologies for Data Science, Bioinformatics 1, Bioinformatics 2, Advanced Topics in Foundations of Databases, Probabilistic Modelling and Reasoning, Reinforcement Learning, Distributed Systems

- Creation of 2-year part-time MSc in High Performance Computing code. This should have been created at same time as the equivalent in HPC with Data Science, but was not. Rationale remains the same: 2-year part-time option allows part-time study during the taught component and equivalent full-time study during the dissertation over the summer months. This can be an attractive option – especially for students being sponsored by employers – as it grants further flexibility in the programmes.

Courses:
Existing MSc courses:

- Dissertation (HPC) – no changes
- Dissertation (HPC with Data Science) – no changes
- Message-passing Programming – no changes
- Threaded Programming – no changes
- Programming Skills – no changes
- Software Development – no changes
- HPC Architectures – no changes
- Fundamentals of Data Management – no changes
- Data Analytics with High Performance Computing – no changes
- Performance Programming – no changes
- Project Preparation – changing from Semester 2 to Full-year (Semester 1 and Semester 2 course). No changes to curriculum. Workload will still focus on Semester 2, but this allows a longitudinal induction into the dissertation projects and focuses the students much more on the importance of engaging with the Project selection phase which already takes place during Semester 1.
- Parallel Design Patterns – no major changes: minor curriculum changes to better act as a more practical follow-on to DAPA.
- Numerical Algorithms for High Performance Computing– changing name from Parallel Numerical Algorithms, minor curriculum changes to fit better alongside DAPA.
- Advanced Message-passing Programming – changing name from Advanced Parallel Programming. Curriculum changes to be a pure Advanced MPI course, with previously 'other' material more naturally fitting in the new Advanced Parallel Techniques course.
- Advanced Parallel Techniques – changing name from Parallel Programming Languages and moving to Semester 2. Major changes: Fortran moving to programme-level induction activity and more advanced topics now expanded on due to Semester 2 placement.

New MSc course:

- Design and Analysis of Parallel Algorithms – relaunch of course previously run in Informatics by Murray Cole taught by Daniel Holmes within EPCC. No major curriculum changes from Murray's course. To run in Semester 1 and have 100% exam assessment. Previous coursework assessments will be offered as formative assessment.

Closing MSc course:

- HPC Ecosystem – closing. Not moving. Relevant material can be taught in other courses and guest lecture series possible elsewhere

Existing DSTI Online Courses:

- Practical Introduction to Data Science – no changes
- Practical Introduction to High Performance Computing – no changes.

New DSTI Course:

- Dissertation (DSTI – EPCC) – required by DSTI.