

**Programme Specification**

**Title of Course: MSc Pharmaceutical Science**

**Date Specification Produced: October 2012**

**Date Specification Last Revised:** **August 2022**

This Programme Specification is designed for prospective students, current students, academic staff and employers. It provides a concise summary of the main features of the programme and the intended learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if they take full advantage of the learning opportunities that are provided. More detailed information on the teaching, learning and assessment methods, learning outcomes and content of each module can be found in the Course Guide, on Canvas and in individual Module Descriptors.

**SECTION 1: GENERAL INFORMATION**

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| **Title:** | MSc Pharmaceutical Science |
| **Awarding Institution:** | Kingston University |
| **Teaching Institution:** | Kingston University |
| **Location:** | Penrhyn Road Campus |
| **Programme Accredited by:** | N/A |

**SECTION 2: THE PROGRAMME**

1. **Programme Introduction**

The philosophy and the aim of the programme is to impart students with critical and technical knowledge related to the development, analysis and production of medicines and enable them to apply it in the drug industry and the regulatory affairs sector. Students will have the scope to study and explore recent trends in chemical, biological and biotechnological therapeutics and be abreast with the latest technologies used in the pharmaceutical industry. They will gain an understanding of the processes involved in the design, development, manufacturing and regulation of medicines. The programme emphasises the key skills required in this specialised area of science including computing and statistical skills, data collection, communication skills, time management, organisational skills and review and synopsis. Our links with practitioners and industry provide a practical base for our courses. They also help us to ensure the programme is kept up-to-date and relevant to the working environment.

This programme enables students to enter employment in areas such as pharmaceutical marketing, sales, research, production, public relations, regulatory affairs, process development, medical statistics and clinical trial organisations.

Key features of the programme include:-

***Real-world project work***

Depending on availability, students can take their MSc project:

* in industry – potential placements include analytical companies and pharmaceutical companies; or
* as collaborative research with other academic institutions.

***Careers and Networking events***

Recent events have included:

* Careers and Networking day- large pharmaceutical companies discussing contemporary research methods and practice, alumni talking about their new jobs (alumni are asked to use social network platforms such as “LinkedIn” to keep in touch with staff and current students), careers staff showing students how to write CVs, present at interviews etc. and research staff discussing how funding is applied for and how to publish/present research findings.

The programme also helps develop employment-ready students through an optional integrated industrial experience in the form of a work placement on the two year version of the programme. This integrated placement provides students with an exciting opportunity to apply and develop their knowledge and skills in a real-world setting, which enables them to develop their self-confidence. Students undertaking such placement activities are in a stronger position to gain the skills and experience that employers desire today.

\*N.B. It is the responsibility of the student to find and arrange the placement.

1. **Aims of the Field/Course**

The aims of the MSc programme are:

* to ensure that students possess an in-depth knowledge of the core elements of pharmaceutical science and their applications in industry and research.
* to enable students develop an understanding of the testing of pharmaceutical products and medical devices in human volunteers and patients, and of the role of statistics and clinical data management.
* to develop students’ problem-solving, practical, IT and key (transferable) skills derived from the collection, analysis, interpretation and representation of data and information in preparation for their careers in a variety of work environments.
* to develop critical awareness of the aspects concerning clinical trials, post-marketing pharmacovigilance and regulatory affairs of drug products manufactured within the pharmaceutical industry.
* to provide the skills required for self-management and autonomy in the planning, organisation and conduct of an independent research project by enabling them to engage with current research methods and techniques.

In addition, the aims of the professional placement module are:

* To provide experience of working in a professional environment that is relevant to the field of study and enhance career prospects through the development of a range of skills that enable students to present themselves effectively, network and make informed decisions about employment and career plans.
* To allow students to consolidate and apply the range of skills and knowledge acquired in the course of their studies to a work environment and to reflect on and develop these skills and knowledge further.

1. **Intended Learning Outcomes**

The programme outcomes are referenced to the QAA subject benchmarks for Chemistry and Pharmacy, and the [Framework for Higher Education Qualifications of UK Degree-Awarding Bodies (2014)](http://www.qaa.ac.uk/quality-code/the-existing-uk-quality-code/part-a-setting-and-maintaining-academic-standards), and relate to the typical student. The course provides opportunities for students to develop and demonstrate knowledge and understanding specific to the subject, key skills and graduate attributes in the areas as outlined within the table on page 5.

In addition, students who successfully complete the professional placement module will be able to:

* Relate academic theory to practice and apply knowledge and skills in a professional context
* Maintain an accurate account of work activity , reflect critically on the experience of the placement and evaluate their own personal and professional development
* Confidently present a critical understanding of the placement organisation and their experience within it
* Develop and practice key personal and employability skills and be able to show examples of the application of these skills including: self-awareness, communication, interpersonal, research and information literacy, numeracy and management and leadership skills
* Autonomously evaluate tasks set in the work place and apply effective communication and problem solving initiatives to achieve the best outcome for the employer;

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| **Programme Learning Outcomes** | | | | | |
|  | **Knowledge and Understanding**  On completion of the course students will be able to: |  | **Intellectual skills**  On completion of the course students will be able to: |  | **Subject Practical skills**  On completion of the course students will be able to: |
| A1 | appreciate the role of pharmaceutical scientist in a variety of work environments and possess a clear understanding of the ethical, legal and commercial responsibilities of the profession | B1 | solve the more complex problems that can arise during the theoretical and/or experimental investigations | C1 | carry out subjectspecific practical work safely and understand the safety requirements which include generating CoSHH forms |
| A2 | possess knowledge of the principles and concepts within pharmaceutical science and acquire competence in the development, selection, and use of a range of pharmaceutical products | B2 | demonstrate the ability to be independent, autonomous and self-managed learners | C2 | demonstrate skills in operating in an efficient manner the techniques used widely in the analytical and pharmaceutical industry |
| A3 | display advanced skills in generation, interpretation and discussion of the laboratory data, in the context of wider scientific problems, and in an industry setting | B3 | identify and select appropriate techniques and procedures for undertaking scientific analyses | C3 | plan and implement good scientific and consistent practice, reliably recording methods and results using appropriate methods to critically analyse the data and statistically evaluate the level of its uncertainty |
| A4 | possess a comprehensive knowledge of the use of IT and predictive systems that are used to produce and evaluate drug molecules and medicinal products | B4 | assemble scientific data from a variety of sources, discern and establish correlations | C4 | be conversant with the detailed and strict requirements of facilities used in the manufacturing of medicines for use by patients |
| A5 | acquire specialist knowledge on quality assurance/control of pharmaceuticals in addition to acquiring specialist knowledge of advanced analytical techniques and specialised applications of those techniques | B5 | critically analyse and appraise information obtained from both primary and secondary sources | C5 | develop an understanding of the analytical challenges particular to the pharmaceutical industry and acquire the specialised knowledge to face those challenges |
| A6 | fully understand how a research project operates and undertake research in a logical and safe manner | B6 | plan, carryout and report investigations with an effective self-critical attitude | C6 | design controlled experiments to investigate qualitative and/or quantitative characteristics of pharmaceuticals and apply and adapt problem solving skills |
| A7 | fully understand how to prepare a research report and poster in the correct format and to have an active engagement and familiarity with recent and current research methods, results and publications | B7 | develop an understanding of the challenges concerning pharmaceutical industry, and with reflection and recall of both theoretical and practical skills, be able to contemplate solutions | C7 | recommend improvements in methodology, technology or interpretation that enhance the performance of processes and/or procedures related to pharmaceutical products |

In addition to the programme learning outcomes identified overleaf, the programme of study defined in this programme specification will allow students to develop a range of Key Skills as follows:

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| **Key Skills** | | | | | | |
| **Self-Awareness Skills** | **Communication Skills** | **Interpersonal Skills** | **Research and information Literacy Skills** | **Numeracy Skills** | **Management & Leadership Skills** | **Creativity and Problem Solving Skills** |
| Take responsibility for own learning and plan for and record own personal development | Express ideas clearly and unambiguously in writing and the spoken work | Work well with others in a group or team | Search for and select relevant sources of information | Collect data from primary and secondary sources and use appropriate methods to manipulate and analyse this data | Determine the scope of a task (or project) | Apply scientific and other knowledge to analyse and evaluate information and data and to find solutions to problems |
| Recognise own academic strengths and weaknesses, reflect on performance and progress and respond to feedback | Present, challenge and defend ideas and results effectively orally and in writing | Work flexibly and respond to change | Critically evaluate information and use it appropriately | Present and record data in appropriate formats | Identify resources needed to undertake the task (or project) and to schedule and manage the resources | Work with complex ideas and justify judgements made through effective use of evidence |
| Organise self effectively, agreeing and setting realistic targets, accessing support where appropriate and managing time to achieve targets | Actively listen and respond appropriately to ideas of others | Discuss and debate with others and make concession to reach agreement | Apply the ethical and legal requirements in both the access and use of information | Interpret and evaluate data to inform and justify arguments | Evidence ability to successfully complete and evaluate a task (or project), revising the plan where necessary |  |
| Work effectively with limited supervision in unfamiliar contexts |  | Give, accept and respond to constructive feedback | Accurately cite and reference information sources | Be aware of issues of selection, accuracy and uncertainty in the collection and analysis of data | Motivate and direct others to enable an effective contribution from all participants |  |
|  |  | Show sensitivity and respect for diverse values and beliefs | Use software and IT technology as appropriate |  |  |  |

1. **Entry Requirements**

The minimum entry qualifications for the programme are a second class UK (or UK equivalent) Bachelor Honour's degree in Pharmaceutical Science, Pharmacy or related i.e. Chemistry or Life Science disciplines. All students applying for this programme should have studied modules which include elements of both chemistry and biology within their bachelor’s degree.

Candidates with an alternative qualification such as an HND are normally expected to have appropriate experience in pharmaceutical or related field.

British nationals/majority English-speaking nation nationals need a GCSE Grade C or above in English or an equivalent qualification, (see webpages for further details). Students who are not a national of a majority English speaking country or who have not completed an academic qualification equivalent to a UK Bachelor’s degree are required to provide evidence of appropriate competence in use of the English Language. A successful completion of a recognised English Language examinations, such as IELTS test (with a minimum overall score of 6.5 with 6.0 in Writing and no element i.e. Reading, Listening and Speaking less than 5.5), is required.

1. **Course Structure**

This programme is offered in full-time mode, and leads to the award of MSc in Pharmaceutical Science. Exit awards such as a postgraduate diploma or a postgraduate certificate are possible when the minimum credits achieved by a candidate are either 120 or 60 respectively. Intake into the programme is normally in September and January.

**E1. Professional and Statutory Regulatory Bodies**

Not applicable.

**E2. Work-based learning, including sandwich programmes**

Depending on availability, MSc research projects may be undertaken in industry.

**E3. Outline Programme Structure**

The MSc is made up of four taught modules each worth 30 credits and a research project worth 60 credits (180 credits total). All students will be provided with the University regulations. Full details of each module will be provided in module descriptors and on module pages within Canvas.

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| --- | --- | --- | --- | --- |
| **Core modules** | **Module code** | **Credit**  **Value** | **Level** | **Teaching Block** |
| **Level 7** | | | | |
| Statistics and Quality Systems | CH7010 | 30 credits | 7 | 1 |
| Pharmaceutical and Analytical Technology | CH7050 | 30 credits | 7 | 2 |
| Manufacture and Clinical Trials of Medicines | CH7060 | 30 credits | 7 | 2 |
| Design, Discovery and Development of Pharmaceuticals | CH7070 | 30 credits | 7 | 1 |
| Project module | CH7100 | 60 credits | 7 | 3 |
| Professional Placement \* | CI7900 | 120 credits | 7 | - |

\*The Professional Placement module is for all placements route students and takes place in June for September entry or February for January entry. It can be up to 1 year in length maximum. Students are expected to engage in 10-12 months of work in the professional environment in a maximum of 2 settings. Assigned hours of work are to be arranged by the supervisor at the host institution. There must be at least 30 hours week of work. All placements will be arrangements between Kingston University and the institution hosting the placement, which may include companies, research institutes and hospitals. Placements are secured by students based on availability and opportunity, taking into consideration the student’s academic background and proficiencies. Selection for placements will often be competitive and at the discretion of the host work place. Students will demonstrate professional responsibility through attendance at the work place for the agreed time and hours, adherence to policies in place at the work place, effective professional communication with supervisors and co-workers, and completion of tasks and duties as they are assigned.

Students joining the course in September undertake modules Statistics and Quality Systems (CH7010) and Design, Discovery and Development of Pharmaceuticals (CH7070) in teaching block 1 (TB1) then progress onto Pharmaceutical and Analytical Technology (CH7050) and Manufacture and Clinical Trials of Medicines (CH7060) in teaching block 2 (TB2) followed by the project (CH7100) in teaching block 3 (TB3). Whilst the assessments within CH7010 and CH7050 are coursework based and are conducted during the term time, the end-of-module exams for CH7070 and CH7060 are held in the first teaching week of January and in April/May periods respectively.

Students joining the course in January will initially take Pharmaceutical and Analytical Technology (CH7050) and Manufacture and Clinical Trials of Medicines (CH7060) in TB2 followed by the project (CH7100) in TB3. They will then complete Statistics and Quality Systems (CH7010) and Design, Discovery and Development of Pharmaceuticals (CH7070) in TB1. These students will write up and submit their final project dissertation copy (CH7100) in January, after they completed all four taught modules so that the knowledge and skills they gained from the taught modules can be applied in the dissertation write up and maximise their performance.

Students exiting the programme with 120 credits are eligible for the award of PGDip. Students exiting the programme with 60 credits are eligible for the award of PGCert.

Students starting the course in September will work on the placement for 10 –12 months, starting from June, before their dissertation. Those students must confirm their placement before the Faculty deadline in May. Students on January intake will work on the placement for 10 –12 months, starting from February, after completing their dissertation. Students on this intake must confirm their placement before the Faculty deadline in December. In either case, the suitability of the placement requires approval of the Course Leader. Students on placement must complete a portfolio assessment which includes a reflection on how the theories they have learnt during their teaching year have helped them in their placement and demonstrate ability to apply their teaching in a real world situation.

1. **Principles of Teaching Learning and Assessment**

The course utilises a wide range of teaching and learning methods that will enable all students to be actively engaged throughout the course. Teaching and learning and assessment methods are carefully crafted to suit the content and the learning outcomes of the module – typically using lectures in the early parts of modules to ensure that students have the key knowledge relating to the module. Through a variety of group and seminar work, practical and laboratory sessions students are then given the opportunity to develop more individual interests and personal and key skills.

The assessment regime for each module provide formative opportunities. A range of assessment methods will be used that enable students to demonstrate the acquisition of knowledge and skills along with opportunities for feedback and ‘feedforward’ in each module that will allow students to enhance their performance in the summative assessments. All assessment procedures and criteria have been designed at level 7 and are indicated in the assessment strategy for all modules offered within the programme. Assessment methods include course work, oral presentations, in-class tests, tests comprising of multiple choice questions (MCQs), examinations, laboratory reports and poster presentations. Care has been taken to avoid assessment bunching. The team make use of technology enhanced learning to improve the student experience and facilitate feedback. Examples include electronic marking and oral feedback via Grademark®, online assessments and bespoke assignments produced using excel and visual basic to enable a quick turnaround of marked material such as problem-solving practical assignments. Electronic feedback in pdf format is sent directly to the students email account. Students are supported by their allocated personal tutor, who will help students draw together the themes of the curriculum synoptically by discussing with them their Personal Development Plan. The development of academic skills is threaded throughout the course and assessed both formatively and summatively. Tutors test progress in the development of these skills, but also identify where students may need additional support, which may come via the Academic Skills Centre or other tailored support. An electronic personal development plan system is used to facilitate the process and will involve various touchpoints at different points of the academic year to ensure engagement between tutor and tutee. These will include for example an initial “get to know you” meeting where students will outline their background, describe what they hope to get from the course and how it will fit into their future career plans. A later meeting will look at results/feedback to date, discuss study methods and possible ways to improve performance.

All of the Course team are research active and regularly publish their work in peer reviewed journals. This research expertise is applied to respective modules i.e. research informed teaching on topics such as formulation and delivery of plasmid DNA and subunit vaccines delivered in CH7060, stability of therapeutic drugs in CH7010 and thermal analysis of pharmaceuticals (polymorphism, purity, degradation) in CH7050 and formulations of solid dosage forms in CH7050 are a few examples. Many hold or have held leading positions in the field such as Hon. Secretary of Royal Society of Chemistry’s (RSC) Analytical Division, Members of the RSC or Pharmaceutical Science professional bodies, Chartered Chemists/EurChem/Chartered Scientists and have professional teaching qualifications such as PGCE(HE).

1. **Support for Students and their Learning**

Students are supported by:

* A Module Leader for each module
* A Course Director to help students understand the programme structure
* Personal Tutors to provide academic and personal support
* A project “placement” tutor to give general advice on placements and visit students
* Technical support to advise students on IT and the use of software
* A designated programme administrator
* An induction and orientation programme at the beginning of each new academic year. This includes an induction to the University, the School, Learning Resource Centre, the Graduate Centre, the Union of Kingston Students, University and School pastoral support and ancillary services
* Student Voice Committee (SVC)
* Canvas – a versatile on-line interactive intranet learning environment
* A substantial Study Skills Centre that provides academic skills support
* Student support facilities that provide advice on issues such as finance, regulations, legal matters, accommodation, international student support etc.
* Disabled student support
* Union of Kingston Students
* Careers and Employability Service

1. **Ensuring and Enhancing the Quality of the Course**

The University has several methods for evaluating and improving the quality and standards of its provision. These include:

* External examiners
* Boards of study with student representation
* Annual Monitoring and Enhancement
* Periodic review undertaken at subject level
* Student evaluation including EMF, SVC and MEQs
* Moderation policies
* Feedback from employers

In the 2017 Departmental Internal Subject Review of Pharmaceutical Sciences and Chemistry courses took place. The review team commended the subject team on several strengths in the provision:

* The proactivity and agility of the academic staff that ensure the delivery of, high quality contemporary programmes.
* The quality of the current students and graduates and their engagement with the review team during the meeting.
* The approachability of staff which was particularly raised by students and graduates in both academic and pastoral care.
* The review team noted the following areas of good practice:
* The clear organisational structure for quality assurance and governance offering inclusivity to student representatives.
* The diagnostic student feedback ensures student expectations are managed from the start of the academic year and that provisions can be put in place to meet student expectations. In particular the maths aids, student support and signposting to academic skills provided to undergraduate students were exemplary.
* The wide range of assessments including course work, presentations, exams and essays.
* The mentoring scheme which provides cohort identity and additional support.
* The review team had confidence in the academic standards set and achieved for the fields involved in the review, in terms of the appropriateness of the content and academic level of the learning outcomes of the fields and the consistency of the actual student achievement with the intended outcomes.
* The review team had confidence in the quality of the learning opportunities that supported the students in achieving the academic standards of the awards to which the fields lead.
* The review team concluded that the fields were current and that the aims and learning outcomes were appropriate and were being met. The review team also concluded that the fields were well structured and complied with the Framework for Higher Education Qualifications and relevant subject benchmark statements.

1. **Employability Statement**

The chemical and pharmaceutical industry is one of the UK’s largest and most successful manufacturing sectors, contributing about £20 billion a year of Added Value to the UK’s Gross Domestic Product (UK Chemical and Pharmaceutical Industry Facts and Figures, 2014\*). The MSc in Pharmaceutical Science is designed to provide graduates with the high level skills and advanced knowledge that are increasingly required for the development, analysis and production of medicines and for work in clinical trials and regulatory affairs. Students will have the opportunity to study and explore recent trends in chemical, biological and biotechnological therapeutics. The course is ideal for graduates who wish to pursue a career in pharmaceutical production, marketing, sales, process development, regulatory affairs, public relations, medical statistics or clinical trials. The course would also prepare students to pursue academic careers in research. Recent surveys indicate most of our graduates finding employment/further education less than 6 months after graduation in many of the areas mentioned above.

Research and development opportunities are extensive and varied, and include development of novel medical and veterinary diagnostic and therapeutic technologies, targeted and controlled drug delivery and other applications which involve biotechnology e.g. formulation of conventional as well as plasmid and subunit antigen vaccines.

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\*[http://www.cia.org.uk](http://www.cia.org.uk/Portals/0/Documents/CIA%20facts%20and%20figures%202014_MR.PDF)

One of the key employability skills at the postgraduate level is: articulation and demonstration of scientific knowledge on a chosen topic which is directly addressed in module CH7050 and also in CH7060 where students are required to present their work orally. Career in research is addressed in several modules i.e. CH7010 and CH7070 where students learn to use wide range of research techniques and make scientific communications involving critical analysis through the report and practical write-ups. The course offers an opportunity to enhance knowledge and to develop hands-on practical skills through modules such as CH7010, CH7050, CH7070 and also through project module CH7100. Past students have gained employment in the pharmaceutical industry, including Pfizer, GlaxoSmithKline, Wockhardt, contract research organisations such as PRA, Bristol labs. Several students have managed to obtain funded PhD positions in well reputed educational institutions across the UK and abroad.

1. **Approved Variants from the Postgraduate Regulations**

There are no variants to postgraduate regulations.

1. **Other sources of information that you may wish to consult**

*Kingston University website:* <http://www.kingston.ac.uk/postgraduate-course/pharmaceutical-science-msc/>

The School of Life Sciences, Pharmacy and Chemistry: [*http://sec.kingston.ac.uk/about-SEC/schools/pharmacy-and-chemistry/*](http://sec.kingston.ac.uk/about-SEC/schools/pharmacy-and-chemistry/)

**Development of Course Learning Outcomes in Modules**

This map identifies where the course learning outcomes are assessed across the modules for this course. It provides an aid to academic staff in understanding how individual modules contribute to the course aims, and a means to help students monitor their own learning, personal and professional development as the programme progresses and a checklist for quality assurance purposes.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Module Code** |  | CH7010 | CH7050 | CH7060 | CH7070 | CH7100 | CI7900 |
| **Programme Learning Outcomes** | **Knowledge & Understanding** | A1 | F | FS | S | S |  | F |
| A2 |  | FS | S | FS |  |  |
| A3 | F | FS |  | FS |  |  |
| A4 |  | F | F | FS |  | F |
| A5 |  | S | S | FS | F |  |
| A6 |  |  |  |  | FS |  |
| A7 |  |  |  |  | S |  |
| **Intellectual Skills** | B1 |  | F | S | FS | FS | F |
| B2 | F | F | F |  | F | F |
| B3 |  | F | F | FS | F | F |
| B4 | F | FS | S | FS | F | F |
| B5 |  | FS | S | FS | F | F |
| B6 |  |  | S | FS | FS | F |
| B7 | FS |  | S |  | F | FS |
| **Practical Skills** | C1 | F | F |  | F |  |  |
| C2 | F | F |  | FS | F | F |
| C3 | FS | FS |  | FS | F | F |
| C4 |  | FS | S |  |  | F |
| C5 | F |  | S | FS | F | F |
| C6 |  |  |  | FS | F |  |
| C7 |  |  |  |  | FS | F |

**S** = summative assessment; **F** = formative assessment.

**Students will be provided with formative assessment opportunities throughout the course to practise and develop their proficiency in the range of assessment methods utilised.**

**Technical Annex**

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| **Final Award(s):** | MSc Pharmaceutical Science |
| **Intermediate Award(s):** | PGDiploma, PGCertificate |
| **Minimum period of registration:** | 1 year; 2 years with Professional Placement |
| **Maximum period of registration:** | 2 years; 3 years with Professional Placement |
| **FHEQ Level for the Final Award:** | 7 |
| **QAA Subject Benchmark:** | [*QAA Master’s Degree Characteristics*](http://www.qaa.ac.uk/quality-code/the-existing-uk-quality-code/part-a-setting-and-maintaining-academic-standards)*.* |
| **Modes of Delivery:** | FT |
| **Language of Delivery:** | English |
| **Faculty:** | Health, Science, Social Care and Education |
| **School:** | Life Sciences, Pharmacy and Chemistry |
| **JACS code:** | B900 |
| **UCAS Code:** | - |
| **Course/Route Code:** | PFPHS1PHS01  PFPHS1PHS99 (Professional Placement) |
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