

Placement Student – Process Modelling (Digital Pharma) – Job Description

Role Purpose:

The successful candidate will use process modelling and simulation methods (e.g., gPROMS, ASPEN, STAR-CCM+) alongside advanced data analytics (hybrid modelling methods) to develop pharmaceutical manufacturing process models. The role will initially involve optimising existing models of continuous direct compression (CDC) unit operations such as feeding, blending and tableting. The candidate will join the Digital Pharma technology team within CPI which also includes a team of data scientists.

Key Responsibilities:

- Embrace and role model the desired behaviours to exemplify our Company values, promoting an ethical, positive company culture.
- To maintain consistent and document compliance with all relevant Safety, Health and Environmental (SHE), Good Manufacturing Practice (GMP), Data Integrity (DI), quality and best practice requirements.
- Using a variety of modelling techniques, develop predictive tools and models to support drug development/manufacturing platforms. Modelling techniques include (but not limited to): discrete element modelling (DEM) tools such as STAR-CCM+, process models and flowsheets (e.g., gPROMS, ASPEN), statistical techniques, model predictive control (MPC), population-balance models (PBM), first-principles engineering models, data-driven modelling.
- Engage with the wider CPI R&D team includes data scientist and process modelling scientists.
- Supporting colleagues in the design, execution, validation, and delivery of modelling projects to a high standard (e.g., Good Manufacturing Practice), and prepare models for commercialisation. Working alongside colleagues to provide customer support and consultancy for modelling tools.
- Documentation of experimental and modelling data and research publications and supporting colleagues in the training of project teams to ensure successful application of process models.
- Work collaboratively with process engineers, chemists, analysts, specialists in instrument automation and control, to apply and implement modelling tools into project workflows, assisting colleagues in troubleshooting complex manufacturing problems and proposing hypotheses to solve issues.
- Work collaboratively with data scientists to assist with the application and implementation of hybrid modelling components.
- Supported by colleagues, work collaboratively with external partners (e.g., universities, research organisations), pharmaceutical clients, and vendors (e.g., software companies) to contribute towards the execution and delivery of modelling projects.

Placement Student – Process Modelling (Digital Pharma) – Job Description

- To work collaboratively with Business Development, Bid Proposal and technical colleagues to contribute to proposal / project development and direct customer engagement. Engage in business development opportunities where appropriate.
- Communicate effectively with technical team leaders, line managers and the wider CPI R&D team and present results internally at meetings and, on occasion, at external forums.
- Present scientific results to a diverse audience through data analysis and visualisations.

Good Manufacturing Practice - GMP

CPI have a responsibility to manufacture medicinal products of the requisite quality, fit for their intended use and be in accordance with the relevant Manufacturing and Marketing Authorisations, Clinical Trial Authorisation, Product Specification, Drug Master File or CEP Dossier as appropriate and which do not place patients at risk due to inadequate safety, quality or efficacy. The Pharmaceutical Quality System, which incorporates Good Manufacturing Practice, is designed to deliver this quality objective, the attainment of which requires the participation and commitment of all staff across departments and at all levels within the company.

Good Manufacturing Practice is the part of Quality Management which ensures that products are consistently produced to the correct quality standards. To comply with the principles of GMP, it is required that clearly defined procedures are adhered to when performing operations across CPI.

Data Integrity - DI

Data Integrity is the degree to which data are complete, consistent, accurate, trustworthy, reliable and that these characteristics of the data are maintained throughout the data life cycle. The data should be collected and maintained in a secure manner, so that they are attributable, legible, contemporaneously recorded, original (or a true copy) and accurate. Assuring data integrity requires appropriate quality and risk management systems, including adherence to sound scientific principles and good documentation practices.

CPI, as a GXP organisation, have developed a Pharmaceutical Quality System, which incorporates a DI Governance System – a series of arrangements to ensure that data, irrespective of the format in which they are generated, are recorded, processed, retained and used to ensure the record throughout the data lifecycle.

To comply with the principles of DI, it is required that clearly defined procedures are adhered to when performing operations across the site. All staff are actively encouraged/supported in the reporting of errors, omissions and undesirable results.

Direct reports: No direct reports

Placement Student – Process Modelling (Digital Pharma) – Job Description

Person specification

Education / Qualifications:

Essential:	Desirable:
Be working towards a degree (or equivalent) in relevant field e.g. chemical engineering, Biochemical Engineering, Process Control Engineering, Pharmaceutical Engineering, Biotechnology, physical sciences, or related discipline with a focus on mechanistic modelling.	

Competencies and behaviours	
<p style="text-align: center;">Leadership (Core)</p> <ul style="list-style-type: none"> Respects and values our diverse people and the differing talents, skills and backgrounds that they bring to projects and day-to-day work. Has a positive influence on those they are in contact with. Gains the respect and confidence of colleagues and supports them in achieving their goals and targets. Aligns their behaviours and actions to our PRIDE values, vision and goals. 	<p style="text-align: center;">Decision Making (Core)</p> <ul style="list-style-type: none"> Within area of expertise recognises, identifies and defines problems. Generates and evaluates alternatives, draws conclusion and analyses risk. Takes timely and correct action using established methods to ensure effective solutions are implemented by working as a team and with and focused outcomes to be delivered.
<p style="text-align: center;">Communication (Core)</p> <ul style="list-style-type: none"> Communicates in a clear and concise manner, covering all relevant points in a timely manner. Uses the appropriate route and format to communicate. Confirms understanding of others communication. Asks questions to understand other people's viewpoints, keeping an open mind and embracing new ideas. 	<p style="text-align: center;">Developing self and others (Core)</p> <ul style="list-style-type: none"> Knows own career aspirations and clearly communicates them to relevant colleagues whilst actively working to achieve goals. Sets personal development goals and deploys strengths to achieve them. Takes responsibility for one's own performance and actions and invites and incorporates feedback from a variety of sources. Regularly reflects on own capabilities

Placement Student – Process Modelling (Digital Pharma) – Job Description

	to identify development priorities.
Collaboration (Core)	Delivery (Core)
<ul style="list-style-type: none"> Establishes effective working relationships with other colleagues. Builds and maintains a network of internal and external contacts. Actively seeks, values and incorporates different views and ideas to broaden their prospective, embracing differing perspectives and unconventional ideas. 	<ul style="list-style-type: none"> Plans, prioritises and leads own area of work to deliver specified and agreed outcomes (time and standard). Accurately scopes out length and difficulty of tasks, and repeatedly estimates correct amount of time needed for tasks. Refers to lessons learnt from other projects/ tasks with related scope. Acts with minimal supervision or direction by being purposely empowered to make decisions when needed. Pays attention to detail and delivers accurate and high-quality outputs.

Placement Student – Process Modelling (Digital Pharma) – Job Description

Knowledge and Experience:

Essential:	Desirable:
<p>Good understanding of fundamental engineering/physical concepts such as mass, momentum, and energy transport phenomenon; and have a mathematical ability to setup and solve linear, non-linear, and differential equations.</p> <p>Have a working knowledge of numerical methods, computational modelling of chemical/physical processes, programming, and mathematics.</p> <p>Have a working knowledge of computational fluid dynamics (CFD), discrete element modelling (DEM) tools such as STAR-CCM+, flowsheet modelling using simulation software like gPROMS Formulated Products, ASPEN or related process simulators, and open-source machine learning and AI technologies applied to process modelling like Python. Matlab & Simulink will be very desirable.</p> <p>Good organisational skills: ability to manage own workload and support with several projects simultaneously, delivering results in a timely manner.</p> <p>Can work effectively as part of cross functional teams and embrace teamwork.</p> <p>Good written and verbal communication skills: must be able to impart ideas and results with colleagues with diverse backgrounds.</p>	<p>Technical experience in model predictive control software like PharmaMV.</p> <p>Technical expertise in the use of Process Analytical Technology (PAT), including equipment, methods, models and data structure requirements.</p> <p>Experience with discrete element method (DEM) and computational fluid dynamics (CFD).</p> <p>Experience with any of the following software is preferred: ASPEN, EDEM, LIGGGHTS, XPS, CFDem, ANSYS Fluent, OpenFOAM, STAR-CCM+, other closely related packages. Knowledge of data analysis and visualisation packages (e.g., Spotfire or Tableau) is desirable.</p> <p>Strong statistical and machine learning skills are also preferred.</p> <p>Experience with developing dashboard tools using software systems like PowerBI.</p> <p>Experience with Code Management Software like GitHub.</p> <p>Knowledge of the software development workflow and commercialisation of modelling components like machine learning regression/classification models.</p> <p>Knowledge of Design of Experiment approaches, AWS tools, database access and query language.</p>

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Signature of Job Holder	
By signing this you confirm you have read, understood, and agree to work in alignment with the above job description.	
Printed name	
Signature	
Date	