

Response of course board to PROGRAMMATIC PANEL REPORT

Course Areas:

Programmatic Review of the School of Mechanical, Electrical & Process Engineering (Phase 2)

Department of Process, Energy & Transport Engineering

22nd – 23rd April, 2015

Process Engineering Programmes Reviewed:

MAJOR AWARDS

Higher Certificate in Science in Good Manufacturing Practice and Technology
Bachelor of Science in Good Manufacturing Practice and Technology
Bachelor of Engineering (Honours) in Chemical and Biopharmaceutical Engineering
Master of Engineering in Chemical and Biopharmaceutical Engineering

SPECIAL PURPOSE AWARDS

Certificate in Biopharmaceutical Manufacturing Operations
Diploma in Biopharmaceutical Manufacturing Operations
Certificate in Food Manufacturing Operations
Certificate in Biopharmaceutical Processing
Certificate in Chemical Process Safety
Certificate in Chemical and Biopharmaceutical Process Operations
Certificate in Process Industries Advancements and Innovation
Postgraduate Certificate in Professional Practice

1.1 Higher Certificate in Science in Good Manufacturing Practice and Technology

1.2 Bachelor of Science in Good Manufacturing Practice and Technology

The course board of the Higher Certificate in Science in Good Manufacturing Practice and Technology and Bachelor of Science in Good Manufacturing Practice and Technology welcomes the Programmatic Panel report on the above programme.

We would like to respond to the Requirements, Recommendations and Commendations.

1.4 Requirements, Recommendations and Commendations

1. The Panel would like to **commend** the programme board on their open and transparent engagement with the review process and on their hard work, efforts and enthusiasm evident in relation to the delivery of the programmes. The panel also **commends** the overall quality of the documentation presented in relation the programmes and the associated modules.

Response: Welcomed by Course Board

2. On review of the programme documents and discussion of the programmes with the programme teams, the Panel **recommends to Academic Council that the Good Manufacturing Programmes listed be revalidated** for a period of five years or until the next Programmatic Review, whichever is sooner, subject to implementation of any panel requirements and successful completion of the module moderation process.

Response: Welcomed by Course Board

3. The panel **recommends** that the programme team investigate the duration and positioning of the work placement module within the Higher Certificate programme. The panel is cognisant that any change to the current work placement model may be difficult to implement due to the constraint of an eighteen month delivery period for the programme.

Response: The Course Board will endeavour to find a solution to this over constrained problem.

4. The panel **recommends** that the programme team review the development of communication skills of graduates within the programmes

Response: Accepted

Bachelor of Engineering (Honours) in Chemical and Biopharmaceutical Engineering

The course board of the Bachelor of Engineering (Honours) in Chemical and Biopharmaceutical Engineering welcomes the Programmatic Panel report on the above programme.

We would like to respond to the Requirements, Recommendations and Commendations.

2.1.5 Requirements, Recommendations and Commendations

2.1.5.1 Overall

1. Following a review of programme documentation and discussions with the programme teams and with learner, graduate and employer representatives, the Panel **approves** the changes to programmes and modules proposed by the department overall and **recommends to Academic Council that the Honours Bachelor of Engineering in Chemical and Biopharmaceutical Engineering be revalidated** for a period of five years or until the next Programmatic Review, whichever is sooner, subject to implementation of any panel requirements and successful completion of the module moderation process, and with all due regard for a timely implementation of the individual panel recommendations set out below.
2. The Panel would like to **commend** the programme teams on their open and transparent engagement with the review process and on their hard work, efforts and enthusiasm evident in relation to the delivery of the programmes. The panel also **commends** the overall quality of the documentation presented in relation to the programmes and the associated modules.

Response: Welcomed by Course Board

2.1.5.2 Programme Level

3. The panel **requires** that the current Group Elective format on the semester schedule be removed and the Free Choice module added in the appropriate semesters.

Response: Accepted

3. The panel **recommends** that the swapping of modules between semesters within the same stage be approved.

Response: Welcomed by Course Board

4. The panel **requires** that the module BIOT6003 Introduction to Ind Biotech remain as an elective on the programme.

Response: Accepted

5. The panel notes the substantial number of modules which are being moved between stages. The panel notes that much of this material is central to the programme. The panel is concerned that potentially students may miss this material in the interim period between the current approved schedule and the proposed schedule being fully enacted. Thus the panel **requires** that a full set of transition schedule for stages 2, 3 and 4 of the programme be developed for the number of years that it takes to transition to the proposed course schedule. These schedules should be accompanied by proposed arrangements to put be in place for legacy and repeat students.

Response: Accepted. Transition schedules are completed. Legacy issues and repeat students will be addressed

6. The panel notes the proposal to move the Advanced Module CHEP8016 Process Energy Analysis from Stage 4 of the programme to Stage 2. In discussions with the programme team it was said that the material would be taught in a different manner to reflect the module's new position within the programme. The panel feel that this new teaching paradigm should be reflected in the module descriptor. Thus the panel **requires** that an intermediate module be written addressing the content of the CHEP8016 module but with its learning outcomes and assessment regime aligned at intermediate level.

Response: This requirement is being addressed immediately. The intermediate module will be completed and sent for review before the end of term.

7. The panel notes the comments from a variety of stakeholders that the current arrangements in respect to work placement are working well. The panel believes that there are substantial reputational and operational risks to undertaking such a fundamental change to an established programme. The panel would ask the programme team to reflect whether the perceived benefits in terms of removal of short delivery modules and longer work placement outweigh these risks. With a full semester of learning associated with the award stage of a programme and in line with IChemE requirements in respect to learning periods external to the Institute, the panel **requires** a robust quality assurance system for the work placement and associated industry project be put in place. This system to include, but not limited to, documented processes with regard to a) suitability of placement organization; b) induction of placement mentors in the workplace; c) supervision arrangements; d) arrangements where suitable placements are not available; e) arrangements where suitable projects within organisations are not available; f) learning agreements between CIT and placement organisation outlining the roles and responsibilities of each partner etc.

Response: The Programme team (Course Board) considered the above request to reflect on whether the perceived benefits in terms of removal of short delivery modules and longer work placement outweigh these risks. The comments in the draft report relating to the reputational and operational risks are acknowledged as the course Board is cognizant that there are risks associated with the proposed changes to semester 7. However the potential benefits to the student of the proposed changes are many and substantial. It is the considered view of the Course Board that the advantages gained through the removal of the existing concentrated delivery in Semester 6, the expected reduction in the intensity of the current Semester 7 student experience and the longer period spent in industry that allows the Engineering Industrial Project to be delivered in an industrial settings are very desirable outcomes. An External Module reviewer who is a member of the IChemE Accreditation Board stated that the Engineering Industrial Project "...is highly relevant to the chemical engineering curriculum..." in the external module evaluation report.

The new “Engineering Industrial Project” provides an opportunity to develop project skills and specific chemical engineering knowledge and will allow further active engagement with our industry partners. The course board envisages the development of Adjunct Faculty from amongst our industrial partners. Benefits also ascribe to industry as the mentoring activities involved in the work placement and Engineering Industrial Project will count towards achieving chartered status for company employees. One of our main competitors has a long established 9 month work placement. The proposed change to semester 7 would introduce an Industrial Placement that would span over 8 months from June until February for most students. The start date would then align with other placements in the university sector. This is seen as a positive development by our industrial partners as it allows synchronized delivery of induction training to students.

The following table is a synopsis of the feedback received from our industrial partners.

Industry Feedback regarding proposed semester 7 placement for Chem & BioPharma Engineering

Name	Position	Company	Response
		Irish Cement	Very positive
		Zenith Technologies	Very positive
		MSD Ballydine	Positive
		Merck Millipore	Very positive
		Roche, Clarecastle	Very positive
		Roche, Clarecastle	Very positive
		Rottapharm	Positive
		Ipsen, Dublin	Positive
		GSK, Currabinny	Very positive
		Eli Lilly, Kinsale	No problem
		Response Engineering	Suit them better

(Contact names and position have been removed)

Response Engineering, Irish Cement and Roche said that they would have a greater return on student training and they would have a longer period to screen student for a graduate engineering role. Roche have longer placements with UL students and find it beneficial for both the student and company and would be a supporter of this change.

Some companies opined that they no difficulty in giving students the odd day off for interviews.

The Course Board agrees, welcomes and accepts the panel requirement of a robust quality assurance system for the work placement and associated industry project be put in place. This system to include, but not limited to, documented processes with regard to

- a) suitability of placement organization;
- b) induction of placement mentors in the workplace;
- c) supervision arrangements;
- d) arrangements where suitable placements are not available;
- e) arrangements where suitable projects within organisations are not available;
- f) learning agreements between CIT and placement organisation outlining the roles and responsibilities of each partner etc.

2.1.5.3 Module Level

8. The panel **requires** that the reading lists associated with modules of the programme be updated.

Response: Accepted.

9. The panel **requires** that the assessment regime of each module be reviewed to ensure that issues such as timing of assessments, over-assessment and repeat assessments are addressed.

Response: Accepted

10. The panel **requires** that the Recommended modules section for each module be reviewed to ensure that the modules specified are appropriate.

Response: Accepted

11. The panel **requires** that proposed module titles incorporating numbers be reviewed and new titles be proposed where appropriate.

Response: Accepted

2.1.5.4 Derogations

12. Subject to confirmation that the current draft IChemE policy has been approved with the requirement that students may not compensate more than 10 ECTS in the award stage of the programme, the panel **recommends** that a special regulation to enact this requirement be formulated and submitted to Council for approval.

Response: Welcomed and accepted

The special resolution is as follows:

Request 1: Final Year Compensation

This programme is accredited by the Institution of Chemical Engineers (IChemE). New accreditation requirements stipulate that programmes allowing compensation may only be accredited if there is a maximum of 10 ECTS compensation in the final year.

We request a derogation from Cork Institute of Technology's Regulations for Modules and Programmes (Marks and Standards) Version 4.0 (14 June 2013), copied below;

5.11.2 Pass By Compensation

Compensation to pass a stage shall be applied only to module results being presented to the current sitting of the PAB. The volume of credit that may be compensated at a sitting is given in the following table.

<i>Amount of credit presented at this sitting</i>	<i>Maximum amount of credit eligible for compensation</i>
90	30
60	20
45, 50 or 55	15
30, 35 or 40	10
15, 20 or 25	5
5 or 10	0

A candidate shall be entitled to pass a stage by compensation provided:

- *no failed mark is more than 5% below the pass mark.*
- *the surplus of the marks in the passed modules being presented in the current sitting is at least double the deficiency in the failed modules. The surplus is to be weighted by the credit value of the module.*

A candidate who avails of compensation as described above will be awarded the credits for the modules being presented to the PAB. It is not permissible under any circumstances to award credit for a module mark below 35%.

Availing of compensation to pass a stage has no implication for the classification awarded.

The special regulation requested is as follows:

Students of Bachelor of Engineering (Honours) in Chemical and Biopharmaceutical Engineering (CR_ECPEN_8) may compensate a maximum of 10 ECTS in the final year.

13. Subject to confirmation that the current draft IChemE policy has been approved with the requirement that students must meet a minimum threshold of advanced chemical engineering credit, the panel **recommends** that programme receives a derogation from the requirement to incorporate a free choice elective in the award stage of the programme.

Response: The current and the draft IChemE accreditation policy have the requirement that students must meet a minimum threshold of advanced chemical engineering credits

Impact on course standing as perceived by external professional accreditation bodies e.g. Engineers Ireland, Institution of Chemical Engineers

The availability and undertaking of these “discipline un-related” modules leads to a perception of inferior standards in CIT courses, particularly when the chosen free electives are strikingly un-related. Furthermore, if a specific “credit-count” must be achieved in discipline-specific areas, the availability of free electives reduces the potential count.

Three issues are arising:

1. *The selection of a module that has no relationship to the discipline denigrates the overall perception of the Award;*
2. *The mark achieved in the Free Elective is inflating the overall mark, potentially leading to crossing a grade threshold*
3. *The availability of Free Electives is reducing the number of credits that may be considered by external accreditation bodies.*

The special regulation requested is as follows:

Students of Bachelor of Engineering (Honours) in Chemical and Biopharmaceutical Engineering (CR_ECPEN_8) may only select cognate electives in the final year.

14. The panel notes the derogation request with respect to award classification for the programme. The panel are unsure as to what adjustment is required resulting from the new proposed semester 7 in industry. The panel **recommends** that the programme team carefully monitor the new programme implementation and, if after careful analysis, they consider that an adjustment to the manner in which award classification is undertaken is required that they bring a proposal to Academic Council for consideration.

Response:

Special regulations for the Classification of Award Results

The current regulations regarding Classification of Stage and Award Results in Cork Institute of Technology's Regulations for Modules and Programmes (Marks and Standards) Version 4.0 (14 June 2013) is copied below;

5.11.4 Classification of Stage and Award Results

A candidate who has passed a stage of a programme shall have the stage result classified in accordance with the award classifications set out in section 5.11.5.

In determining the classification of a stage result all marks obtained following reassessment or repeating of any module are capped at the pass mark for the purposes of calculating the total credit-weighted marks. Any transcript or Diploma Supplement should show the actual mark achieved following reassessment.

***Classification of Award Results on Major Awards** - An Award is classified by the classification of its Award Stage except where specifically provided for by resolution of the Academic Council.*

The special regulation requested is as follows:

The Classification of Award Results of the Bachelor of Engineering (Honours) in Chemical and Biopharmaceutical Engineering (CR_ECPEN_8) is based on a weighted 25% third year, 75% final year.

The purpose of this award classification criteria is to adjust the "External project and placement" / taught module balance in final year, due to the new Semester 7 in industry.

The introduction of the proposed semester 7 Work Placement / Engineering Industrial Project would change the award year ratio of Project and Work Placement based learning to formal standard academic modules from 25/35 in the current schedule to 40/20 under the proposed schedule. If the derogation requested above was applied this ratio would be 32.5/27.5. The course Board is of the opinion that the introduction of the requested weighting would rebalance the award and would introduce an additional motivational factor to third year.

University College Dublin operate a 30/70 third year/forth year weighting, while University of Limerick have a 20/40/40 weighting on 2/3/4 year to determine the award classification.

Finally we believe that the introduction of this weighting would introduce a beneficial inertia to the programme and give a better overall measurement of the achievement of the Programme Outcomes by graduates of the programme.

2.2 Master of Engineering in Chemical and Biopharmaceutical Engineering

The Course Board of the Higher Certificate in Science in Good Manufacturing Practice and Technology and Bachelor of Science in Good Manufacturing Practice and Technology welcomes the Programmatic Panel report on the above programme.

We would like to respond to the Requirements, Recommendations and Commendations.

2.2.2 Requirements, Recommendations and Commendations

1. Following a review of programme documentation, the Panel **approves** the changes to programmes and modules proposed by the department overall and **recommends to Academic Council that the Masters of Engineering in Chemical and Biopharmaceutical Engineering be revalidated** for a period of five years or until the next Programmatic Review, whichever is sooner, subject to implementation of any panel requirements and successful completion of the module moderation process, and with all due regard for a timely implementation of the individual panel recommendations set out below.

Response: Welcomed by Course Board

2. The panel **requires** that a draft schedule for the programme be created on Akari Document reflect the proposed elective changes.

Response: Accepted. Draft schedule are completed

3. The panel **requires** that the reading lists associated with modules of the programme be updated.

Response: Accepted

2.3 Special Purpose Awards

2.3.1 Certificate in Biopharmaceutical Manufacturing Operations

The principal aim of this programme is to enhance the student's knowledge and skills base to improve their prospects when applying for employment in the pharmaceutical or biopharmaceutical sector at technician level in production, quality assurance or validation roles within leading pharmaceutical, biopharmaceutical, medical device or food manufacturing companies. The programme is at level 6 on the National Framework of Qualifications and attracts 55 ECTS credits.

The changes proposed in this programmatic review include:

1. CRAF6016 Fluids and Gases will replace CHEP7010 Transfer Processes 1. CHEP7010 Transfer Processes 1 and CRAF6016 Fluids and Gases cover similar content but the experience of

delivering this module has shown that a level 6 module is more appropriate to the mathematical skills of the student intake cohort.

2. BIOM6003 Cleanroom Management will move from Semester 2 to Semester 1 to facilitate co-delivery with another cohort group.

2.3.2 Diploma in Biopharmaceutical Manufacturing Operations

This special purpose award provides an accredited qualification for people wishing to work in production, quality assurance or validation roles within Pharmaceutical/Biopharmaceutical manufacturing companies. Key topics addressed include GMP and Quality Assurance, Lean Manufacturing, Validation, Manufacturing Technology, Technology Transfer, Biopharmaceutical Upstream and Downstream operations. The programme is at level 7 on the National Framework of Qualifications and attracts 60 ECTS credits.

The changes proposed in this programmatic review include:

1. Technology Transfer (MGMT7047) – It is proposed to a) amend the learning outcomes, b) update the indicative content to and reduce the level of overlap with the Validation Science module (MANU7007), c) include a presentation in the assessment regime.

2.3.3 Certificate in Food Manufacturing Operations

This special purpose award provides an accredited qualification for people wishing to work in production, quality assurance or food safety management roles within Food manufacturing companies. Key topics addressed include GMP and Quality Assurance, Essential Mathematical Skills, Cells and Biomolecules, Transfer Processes, Thermofluids, Quality Assurance in Food Manufacturing and Food Processing. This programme is at level 6 on the National Framework of Qualifications and attracts 50 ECTS credits.

This programme is in its first year of delivery and no changes are proposed.

2.3.4 Postgraduate Certificate in Professional Practice

This programme is in its first year of delivery and no changes are proposed.

2.3.5 Certificate in Biopharmaceutical Processing

The principal aim of this programme is to upskill Bachelor of Engineering, Bachelor of Science and Higher Certificate graduates in the area of Biopharmaceuticals focusing on both upstream and downstream processing. This certificate will allow students to attain a knowledge and understanding of the principles of Biopharmaceutical processing and its underpinning science. The programme is at level 7 on the National Framework of Qualifications and consists of two 5 ECTS credit modules.

The changes proposed in this programmatic review include:

1. Modules (BIOT7005 and BITO7006) are updated to incorporate Single Use Technology/PAT and other recent trends.

2.3.6 *Certificate in Chemical Process Safety*

The programme is at level 8 on the National Framework of Qualifications and consists of two 5 ECTS credit modules, namely Chemical Process Safety (CHEP8023) and Chemical Safety Applications (CHEP8024).

No changes are proposed to this programme.

2.3.7 *Certificate in Chemical and Biopharmaceutical Process Operations*

This programme is at level 8 on the National Framework of Qualifications and attracts 60 ECTS credits. The programme provides an opportunity for level 6 graduates in engineering and science to take a suite of modules from the early stages of the Chemical and Biopharmaceutical (Honours) degree programme and the second year of the Higher Certificate in Science in Good Manufacturing Practice & Technology. This programme differs in content from the department's 'Good Manufacturing Practice' Level 6 offering as it immerses students in engineering concepts and technical aspects of manufacturing operations (fluid mechanics, heat transfer, biotechnology, manufacturing, solvent separation, process design etc). These modules serve to enhance the student's prospects when applying for employment as a process operator or process supervisor in the pharmachem or biopharma sector. In exceptional circumstances graduates may progress to Stage 2 of the B.Eng. (Hons) Chemical & Biopharmaceutical Engineering Programme.

The changes proposed in this programmatic review include:

1. Updating the content of programme modules to ensure currency, reflecting new trends.
2. Updating the resource list to keep this information current.

2.3.8 *Certificate in Process Industries Advancements and Innovation*

This programme is designed to broaden and deepen the knowledge and skill base of graduates of a level 8 degree in an engineering or science discipline. This is a Postgraduate level award which develops 'Transition Skills' for process development. Engineering graduates have shown particular interest in enhancing their knowledge of issues such as Emerging Technologies in Biopharma-Processing, Process Technology Transfer and Lean Manufacturing. Modules have been designed specifically to meet these requirements. This programme is at level 9 on the National Framework of Qualifications and attracts 35 ECTS credits.

No changes are proposed for this programme.

2.3.9 *Requirements, Recommendations and Commendations*

1. Following a review of programme documentation, the Panel **approves** the changes to programmes and modules proposed by the department overall and **recommends to Academic Council that the**

Certificate in Biopharmaceutical Manufacturing Operations
Diploma in Biopharmaceutical Manufacturing Operations
Certificate in Food Manufacturing Operations
Certificate in Biopharmaceutical Processing
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Postgraduate Certificate in Professional Practice

be revalidated for a period of five years or until the next Programmatic Review, whichever is sooner, subject to implementation of any panel requirements and successful completion of the module moderation process, and with all due regard for a timely implementation of the individual panel recommendations set out below.

Response: Welcomed by department.