

Programmatic Review



School of Informatics & Engineering

Peer-review panel report

9th December 2010

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1. Executive summary

- 1.1. The School of Informatics and Engineering, Institute of Technology Blanchardstown undertook a review of its programmes and activities during the academic year 2010-2011. The School is comprised of the Department of Engineering and Trades, Department of Informatics and the Centre for Multidisciplinary Studies¹. Staff of the School produced a self-evaluation report. An external peer-review panel was established by the Registrar. This panel met on the 23rd and 24th November 2010 to consider the self-evaluation report and to meet with staff of the School. This report identifies the findings of this peer-review panel.
- 1.2. The overall recommendation of the panel was that all proposed changes to existing syllabi and recommendations made in the self-evaluation report be accepted. The panel recommended that all the programmes be accredited for five years.
- 1.3. The panel was impressed by the depth of self analysis that was undertaken by the School, how the teaching processes accommodate the varied learning styles of students, the use of enquiry based learning in teaching pedagogies and the panel would like to commend the management and staff of the School for the quality of the documentation and the level of open and frank dialog throughout the various engagements during the visit.

2. Preamble

- 2.1. The School of Informatics and Engineering, Institute of Technology Blanchardstown undertook a review of its programmes and activities during the academic year 2010-2011. The process followed was that described in Institute policy 2MP15 “Monitoring and evaluation of academic programmes”. Staff of the School produced a self-evaluation report of activities as described in 2MP15.
- 2.2. An external peer-review panel was established by the Registrar following the procedures outlined in 2MP15. This panel met on the 23rd and 24th November 2010 to consider the self-evaluation report and to meet with staff of the School.
- 2.3. The peer-review group produced a report of their findings (this report) and this will be reported to the Academic Council of the Institute as per agreed quality assurance policy 2MP15.

¹ The Centre for Multidisciplinary Studies operated from September 2008 to September 2010 and has since been subsumed back into the other departments.

3. Programmes considered for re-validation

Department of Informatics Programmes

BN518	BN_KMSIT_R	Master of Science in Computing	NFQ Level 9 90 ECTS credits
BN517	BN_KMSIT_G	Postgraduate Diploma in Science in Computing	NFQ Level 9 60 ECTS credits
BN512	BN_KMSCI_R	Master of Science in Computing	NFQ Level 9 60 ECTS credits
BN509	BN_KCOMP_G	Higher Diploma in Science in Computing	NFQ Level 8 60 ECTS credits
BN104	BN_KCOMP_8	Bachelor of Science (Honours) in Computing	NFQ Level 8 240 ECTS credits
BN002	BN_KCOMP_C	Higher Certificate in Science in Computing in Information Technology	NFQ Level 6 120 ECTS credits
BN013	BN_KCOMP_7	Bachelor of Science in Computing in Information Technology	NFQ Level 7 180 ECTS credits
BN302	BN_KCOMP_D	Bachelor of Science in Computing in Information Technology	NFQ Level 7 60 ECTS credits
BN402	BN_KCOMP_B	Bachelor of Science (Honours) in Computing in Information Technology	NFQ Level 8 60 ECTS credits
BN120	BN_KISDF_8	Bachelor of Science (Honours) in Computing in Information Security and Digital Forensics	NFQ Level 8 240 ECTS credits
BN034	BN_KISDF_7	Bachelor of Science in Computing in Information Security and Digital Forensics	NFQ Level 7 180 ECTS credits
BN311	BN_KISDF_D	Bachelor of Science in Computing in Information Security and Digital Forensics	NFQ Level 7 60 ECTS credits
BN420	BN_KISDF_B	Bachelor of Science (Honours) in Computing in Information Security and Digital Forensics	NFQ Level 8 60 ECTS credits
BN116	BN_KCFSM_8	Bachelor of Science (Honours) in Computer Systems Management	NFQ Level 8 240 ECTS credits
BN027	BN_KCFSM_7	Bachelor of Science in Computer Systems Management	NFQ Level 7 180 ECTS credits
BN026	BN_KCFSM_C	Higher Certificate in Science in Computer Systems Management	NFQ Level 6 120 ECTS credits
BN308	BN_KCFSM_D	Bachelor of Science in Computer Systems Management	NFQ Level 7 60 ECTS credits
BN416	BN_KCFSM_B	Bachelor of Science (Honours) in Computer Systems Management	NFQ Level 8 60 ECTS credits
BN900	BN_KITSU_C	Higher Certificate in Science in Information Technology Support	NFQ Level 6 120 ECTS credits
BN900A	BN_KITSU_CA	Higher Certificate in Science in Information Technology Support	NFQ Level 6 (128 credits)
BN930	BN_KITSU_D	Bachelor of Science in Computing in Information Technology Support	NFQ Level 7 60 ECTS credits
BN950	BN_KCSMT_B	Bachelor of Science (Honours) in Computer Services Management	NFQ Level 8 60 ECTS credits

Department of Engineering and Trades Programmes

BN523	BN_EMSTE_R	Master of Science in Technology Entrepreneurship	NFQ Level 9 90 ECTS credits
BN524	BN_EMSTE_G	Postgraduate Diploma in Science in Technology Entrepreneurship	NFQ Level 9 60 ECTS credits
BN106	BN_EELTC_8	Bachelor of Engineering (Honours) in Computer Engineering	NFQ Level 8 300 ECTS credits
BN012	BN_EELTC_7	Bachelor of Engineering in Computer Engineering	NFQ Level 7 180 ECTS credits
BN001	BN_EELTC_C	Higher Certificate in Engineering in Electronics and Computer Engineering	NFQ Level 6 120 ECTS credits
BN301	BN_EELTC_D	Bachelor of Engineering in Computer Engineering	NFQ Level 7 60 ECTS credits
BN401	BN_EELTC_B	Bachelor of Engineering (Honours) in Computer Engineering	NFQ Level 8 120 ECTS credits
BN105	BN_EMECH_8	Bachelor of Engineering (Honours) in Mechatronics	NFQ Level 8 300 ECTS credits
BN009	BN_EMECH_D	Bachelor of Engineering in Mechatronics	NFQ Level 7 180 ECTS credits
BN407	BN_EMECH_B	Bachelor of Engineering (Honours) in Mechatronics	NFQ Level 8 120 ECTS credits
BN903	BN_EMECH_C	Higher Certificate in Engineering in Mechatronics	NFQ Level 6 120 ECTS credits
BN306	BN_EMECC_D	Bachelor of Engineering in Mechatronics	NFQ Level 7 60 ECTS credits
BN039	BN_ESECT_7	Bachelor of Science in Sustainable Electrical and Control Technology	NFQ Level 7 180 ECTS credits
BN035	BN_ESECT_C	Higher Certificate in Science in Electrical Technology	NFQ Level 6 120 ECTS credits
BN312	BN_ESECT_D	Bachelor of Science in Sustainable Electrical and Control Technology	NFQ Level 7 60 ECTS credits
BN417	BN_EBSEE_B	Bachelor of Science (Honours) in Entrepreneurship in Engineering	NFQ Level 8 60 ECTS credits
BN421	BN_EBSEI_B	Bachelor of Science (Honours) in Entrepreneurship in Information Technology	NFQ Level 8 60 ECTS credits
BN419	BN_EBSEH_B	Bachelor of Science (Honours) in Entrepreneurship in Horticulture	NFQ Level 8 60 ECTS credits
BN717	BN_EMECH_XME	Certificate in Engineering. Minor award of the Bachelor of Engineering in Mechatronics – Level 6	NFQ Level 6 25 ECTS credits
BN718	BN_EMECH_X3D	Certificate in Computer Aided Design and Manufacturing. Minor award of the Bachelor of Engineering (Honours) in Mechatronics - Level 8	NFQ Level 8 15 ECTS credits

Centre for Multidisciplinary Studies Programmes

BN112	BN_DDMED_8	Bachelor of Arts (Honours) in Creative Digital Media	NFQ Level 8 240 ECTS credits
BN021	BN_DDMED_7	Bachelor of Arts in Creative Digital Media	NFQ Level 7 180 ECTS credits
BN413	BN_DDMED_B	Bachelor of Arts (Honours) in Creative Digital Media	NFQ Level 8 60 ECTS credits
BN746	BN_DDMED_XWC	Certificate in Creative Web Communication. Minor award of the Bachelor of Arts (Honours) in Creative Digital Media - Level 6	NFQ Level 6 30 ECTS credits
BN748	BN_DDMED_XDI	Certificate in Creative Digital Imaging. Minor award of the Bachelor of Arts (Honours) in Creative Digital Media - Level 6	NFQ Level 6 20 ECTS credits
BN113	BN_SHTSC_8	Bachelor of Science (Honours) in Horticulture	NFQ Level 8 240 ECTS credits
BN022	BN_SHTSC_7	Bachelor of Science in Horticulture	NFQ Level 7 180 ECTS credits
BN406	BN_SHTSC_B	Bachelor of Science (Honours) in Horticulture	NFQ Level 8 60 ECTS credits
BN007	BN_SHORW_D	Bachelor of Science in Horticulture	NFQ Level 7 180 ECTS credits
BN008	BN_SHORB_D	Bachelor of Science in Horticulture	NFQ Level 7 180 ECTS credits
BN907	BN_SHORK_D	Bachelor of Science in Horticulture (Work based)	NFQ Level 7 180 ECTS credits
BN749	BN_SHTSC_XPS	Certificate in Plant Studies. Minor award of the Bachelor of Science (Honours) in Horticulture - Level 6	NFQ Level 6 20 ECTS credits

Special Purpose Awards

BN701	BN_KCCNA_Q	Certificate in CISCO-CCNA Level 6 20 ECTS credits
BN702	BN_KCCNP_Q	Certificate in CISCO-CCNP Level 7 40 ECTS Credits
BN703	BN_KITES_Q	Certificate in CISCO IT Essentials Level 6 10 ECTS credits
BN705	BN_KNSEC_Q	Certificate in CISCO Network Security 1 Level 7 10 ECTS credits
BN706	BN_KNPLUS_Q	Certificate in CompTIA Network + Level 6 5 ECTS credits
BN707	BN_KAPLUS_Q	Certificate in CompTIA A+ Level 6 10 ECTS credits
BN708	BN_KPCMN_Q	Certificate in PC Maintenance and Networking Level 6 15 ECTS credits
BN719	BN_KNSC2_Q	Certificate in Cisco Network Security 2 Level 8 10 ECTS Credits
BN720	BN_KEHAC_Q	Certificate in EC-Council Certified Ethical Hacker Level 6 10 ECTS Credits
BN724	BN_KCSVP_Q	Certificate in CompTIA Server+ Level 6 10 ECTS Credits
BN725	BN_KSCJP_Q	Certificate in Sun Certified Java Programmer Level 6 20 ECTS Credits
BN726	BN_KSCJD_Q	Certificate in Sun Certified Java Developer Level 7 10 ECTS Credits
BN727	BN_KCSCP_Q	Certificate in CompTIA Security+ Level 6 10 ECTS Credits
BN728	BN_KMCTS_Q	Certificate in Microsoft Certified Technology Specialist: .NET Framework Windows Applications Level 6 20 ECTS Credits
BN729	BN_KMCDA_Q	Certificate in Microsoft Certified Database Administrator Level 7 20 ECTS Credits
BN731	BN_EEDRT_Q	Certificate in Energy Efficient Domestic Retrofit Technology Level 6 25 ECTS credits
BN732	BN_EEEHS_Q	Certificate in Energy Efficient Heating Systems Level 6 20 ECTS credits
BN733	BN_ECEBL_Q	Certificate in Enquiry Based Learning Level 9 10 ECTS Credits
BN737	BN_KCNAS_Q	Certificate in CCNA Security Level 7 10 ECTS Credits
BN738	BN_KCNAV_Q	Certificate in CCNA Voice Level 7 10 ECTS Credits
BN739	BN_KCNAW_Q	Certificate in CCNA Wireless Level 7 10 ECTS Credits
BN740	BN_KDHTI_Q	Certificate in CEA-CompTIA Digital Home Technology Integrator Plus (DHTI+) Level 6 10 ECTS Credits

4. Peer-review panel

Dr. Dermot Douglas	Higher Education Consultant (Chair)
Dr. Deirdre Lillis	Head of School of Computing Dublin Institute of Technology
Mr. Denis McFadden	Head of School of Engineering Letterkenny Institute of Technology
Ms. Maria Kyne	Head of School of the Built Environment Limerick Institute of Technology
Mr. Simon Perkins	Multimedia Programme Leader Nottingham Trent University, UK
Ms. Louise Kane	Students' Union Deputy President Athlone Institute of Technology
Dr. Adam Winstanley	Head of Computer Science National University of Ireland, Maynooth
Mr. Martin Duffy	ASA Consulting

Also in attendance:

Dr. Diarmuid O'Callaghan	Registrar Institute of Technology Blanchardstown
Mr. Michael Keane	Quality Assurance Officer Institute of Technology Blanchardstown

Institutional Staff, Students and External Stakeholders Consulted

4.1. Management:

Dr. Mary Meaney	President
Dr. Larry McNutt	Head of School of Informatics and Engineering
Dr. Brian Nolan	Head of Department of Computing
Mr. Richard Gallery	Head of Department of Engineering
Mr. Damian Cox	Head of Centre for Multidisciplinary Studies
Mr. Liam Quirke	Head of Trades

4.2. Academic:

Dr. Matt Smith	Dr. Catherine Deegan	Dr. Anthony Keane
Mr. Daniel McSweeney	Mr. Tom Nolan	Mr. Michael Hagan
Mr. Niall Campbell	Mr. Cormac McMahon	Mr. Hugh McCabe
Mr. Mark Cummins	Ms. Orla McMahon	Ms. Frances Murphy
Ms. Geraldine Gray	Mr. Conn Cremin	Mr. Stephen Sheridan
Mr. Michael O'Donnell	Dr. Luke Raeside	Ms. Margaret Kinsella
Dr. Garret Brady	Dr. Simon McLoughlin	Ms. Niamh O'Hora
Mr. Gerard Duke	Mr. Niall Bell	Ms. Clodagh Lynch
Mr. John Kilcoyne	Mr. Gareth Curran	Ms. Sinéad Curran
Ms. Rachel Freeman	Dr. Arnulf Horn	Dr. Darren Lavelle
Dr. Markus Hofmann	Mr. Raymond Manley	Mr. John Massey
Mr. Fergus Maughan	Mr. Benjamin Toland	Mr. Derek Kerr
Mr. David Peyton	Mr. Shaun Ferns	Mr. Ivan Smyth
Ms. Ciarnad Ryan	Mr. David Carroll	Dr. Kevin Farrell
Dr. Barry Kirkpatrick	Mr. Paul Stacey	Ms. Aoife Fox
Mr. Arnold Hensman	Ms. Maria Brennan	Dr. James Duffy
Dr. Mohamad Saleh		

4.3. Students:

Mr. Conor McKay BN015 Y1	Mr. Gerard Morrissey BN306 Y1	Mr. Samoil Paun BN106 Y1
Mr. Obinna Nestra BN009 Y1	Mr. Francis Molloy BN039 Y1	Mr. Eamonn Doyle BN022 Y2
Ms. Mihaela Hamzu, BN104 Y2	Mr. Adrian Clarke BN306 Y2	Mr. Fran Gibson BN039 Y2
Mr. Darren Cloney, BN009 Y2	Mr. Karl Quinn BN903 Y2	Mr. Paul Sexton BN002 Y2
Ms. Grace Dunne BN301 Y3	Mr. Derek Joyce BN021 Y2	Mr. James Devon BN021 Y2
Mr. Andrew Ruiter BN007 Y3	Mr. Michael Brogan Postgraduate	Mr. Vincent McGrane BN417 Y4
Mr. Simon Murray Postgraduate	Mr. Sean Haughey Postgraduate	Mr. Chris Murphy Postgraduate

4.4. External stakeholders:

Mr. Michael Meagher Microsoft	Ms. Caoimhe Brennan Ericsson	Ms. Mary Bradshaw Damovo
Mr. Pat McCarthy Cork Institute of Technology	Mr. Pat O'Connor HEA	Mr. Niall Byrne Openet
Mr. William Dick Wavebob	Mr. Michael Brennan FÁS	Mr. Eoghan Glynn Red Hat
Mr Alan Moloney Hartstown Community School	Mr. Peter Luke Pearson VUE	Ms. Michelle Brady St. Philip The Apostle Senior National School Blanchardstown
Ms. Bernadette Garry Killester College	Ms. Colette Cleary Whitehall College	Mr. Michael Foley College of Further Education Dundrum

5. Timetable of review

5.1 Day I – 23rd November 2010

9.00 – 10.00	Panel session I: Private panel meeting <ul style="list-style-type: none">• Programmatic review in context• Issues arising from the self-evaluation report• The day ahead
10.00 - 11.15	Panel session II: Meeting with President, Head of School, Heads of Departments <ul style="list-style-type: none">• The Institutional context• School overview and strategic objectives• Departmental overviews
11.15 - 11.30	Coffee
11.30 – 13.15	Panel session III: Meeting with Head of School, Heads of Departments, senior lecturers and course coordinators <ul style="list-style-type: none">• The review process undertaken<ul style="list-style-type: none">○ Departmental level○ Programme level
13.15 – 14.00	Lunch
14.00 – 16.45	Panel session IV: Programme review meeting with Academic staff <ul style="list-style-type: none">• Review of all programmes• Proposed changes, rationale, benefits, effects etc.
16.45 – 18.30	Panel session V: Private panel meeting <ul style="list-style-type: none">• Initial feedback• Items requiring further analysis• Outstanding items
19.30	Panel dinner (Crowne Plaza Hotel, Blanchardstown)

5.2 Day II – 24th November 2010

9.00 – 10.00	Panel session VI: Private panel meeting <ul style="list-style-type: none">• Review of Day 1• The day ahead
10.00 - 11.15	Panel session VII: Stakeholder meeting <ul style="list-style-type: none">• External<ul style="list-style-type: none">○ Employers○ Industry leaders○ Feeder colleges
11.15 – 12.30	Panel session VIII: Stakeholder meeting <ul style="list-style-type: none">• Students<ul style="list-style-type: none">○ Undergraduate○ Postgraduate○ Alumni
12.30 – 13.15	Tour of facilities
13.15 – 14.00	Lunch
14.00 – 16.00	Panel session IX: Private panel meeting <ul style="list-style-type: none">• Review of stakeholder feedback• Summary analysis of review findings
16.00 – 16.30	Panel session X: Meeting with President, Head of School and Heads of Departments <ul style="list-style-type: none">• Decision of panel

6. Documentation submitted for consideration

6.1. The panel considered the following documentation:

- Volume I School overview;
- Volume II Departmental overview –
 - Engineering and Trades
 - Informatics
 - Centre for Multidisciplinary Studies;
- Volume III Programme review –
 - Engineering and Trades
 - Informatics
 - Centre for Multidisciplinary Studies;
- Programme schedules and syllabi outlining proposed amendments;
- Wiki workspace - <http://programmaticreview2010.pbworks.com>

7. Panel session I: Private panel meeting

- 7.1. The Registrar welcomed the panel re-iterating the importance of the work being undertaken, it's relevance within Institutional review and the retention of delegated authority.
- 7.2. It was noted that the programmatic review process is part of a suite of quality assurance processes agreed with HETAC and in accordance with the provisions of Section 28 of the Qualifications (Education and Training) Act 1999. This exercise takes place every 5 years and follows the process documented in Institute policy 2MP15 "Monitoring and evaluation of academic programmes". The main process involves self-study with recommendations of amendments to existing approved course schedules with associated justification.
- 7.3. As per agreed procedure, the Registrar acted as secretary to the group.
- 7.4. It was noted that the Academic Council has responsibility for ensuring that recommendations of this panel report are implemented.
- 7.5. The Chairman presented the context of the panel review and noted that the purpose of programmatic review is to:
 - Facilitate a reflective self-study within the School which allows critical evaluation of all activities, both current and proposed, with consideration of this self-study by a panel of peers drawn from education and industry;
 - Facilitate a review of all academic courses provided by the School indicating how they have been updated in light of changing environmental conditions and recent knowledge. Consider updated recommendations from course boards;
 - Issue recommendations for re-accrediting programmes for the next 5 years;
- 7.6. The roles and responsibilities of the panel as listed in Institute policy document 2MP17 "Roles and responsibilities of external experts on validation and review panels" were noted.

8. Panel session II: Meeting with President, Head of School and Heads of Departments

- 8.1. The President welcomed the panel, noted that this was the first programmatic review since the Institute was awarded delegated authority in June 2006 and outlined how IT Blanchardstown has evolved in the interim with a year on year exponential increase in student numbers, new and exciting offerings in information security and digital forensics, creative digital media, horticulture, mechatronics, entrepreneurship and postgraduate research opportunities.
- 8.2. The Head of School of Informatics and Engineering welcomed the panel and briefly described the approach taken for programmatic review within the School and the relationship between the activities of the School and the strategic plan of the Institute.
- 8.3. An overview of the challenges facing the School were presented including the declining number of apprentice students and the resultant retraining and up skilling of School staff in response to same. The development of new

undergraduate programmes and special purpose awards to address industry demand, rising student numbers and the need to up skill tradespeople due to the downturn in the construction sector were discussed. Heads of the various departments outlined to the panel efforts undertaken as a retention strategy and to enrich the first year experience for students. These included workshops/drop-in clinics on mathematics and programming, identification of student learning styles, the use of alternative delivery modes and assessment strategies with an increase in continuous assessment as opposed to a reliance on final exam. Challenges facing the School in the absence of funding from the Strategic Innovation Fund in relation to the provision of these additional student supports were also discussed.

- 8.4. It was noted that the current strategic plan runs from 2006 – 2011 and feedback from this programmatic review and Institutional review (Feb 2011) will assist in the development of a strategic plan for the next 5 years.

9. Panel session III: The review process - departmental overview

- 9.1. The Heads of the three departments briefly outlined the approach and process undertaken for programmatic review. The panel was informed of how the process was parsed into a series of stages as described in the Institute policy 2MP15². Programmes were reviewed by subject teams and changes considered by a steering group. A SWOT analysis was completed for each programme.
- 9.2. The panel heard how SWOT analysis was conducted at many levels. The School and Department analysis presented in volume 2 was based on the collective SWOT analyses completed at a programme level.
- 9.3. Stakeholder input into the SWOT analysis was also discussed with feedback reflected in strategic planning activities of each Department. The conclusions as to how Departments met their strategic goals were presented in volume 2 of the submission documents.
- 9.4. Student retention was discussed in the light of statistical information provided within the submission documents covering the period since the last programmatic review. The panel expressed concern at what appeared to be low progression rates in some programmes. Further analysis with remedial action to address same, where possible, was encouraged by the panel.
- 9.5. The issue of learning difficulties was discussed. The panel heard how a proactive approach to assessment of learning styles is taken with a feedback report provided to students. The course coordinator and lecturers also receive reports outlining any special learning needs with guidance on how to address any identified issues. Training in the area of learning styles is conducted as part of staff induction in September.
- 9.6. The use of the QA1³, QA2 and QA3 forms as an effective tool for obtaining feedback was considered. The panel was of the opinion that more productive feedback could be obtained by making the QA3 form available to students online. This opinion concurred with feedback received during student stakeholder discussions in panel session VIII.

² Policy on “Monitoring and evaluation of academic programmes”

³ Institutes of Technology Survey of Students by Lecturer

- 9.7. Reassurance was sought and received by the panel regarding recommendations emanating from peer review reports. The Quality Assurance Officer outlined the process employed by the Institute in how recommendations are logged, actioned, assigned, tracked and provided proof of closure.
- 9.8. The issue of termination of redundant courses was considered. Mechanisms to terminate delivery were discussed. See section titled “11.8 Retired programmes as part of this programmatic review”.
- 9.9. The panel heard how the Department of Engineering had recently completed a successful accreditation visit from Engineers Ireland and how the output from this provided valuable feedback on the engineering programmes which was used for programmatic review. Programmes recognised by Engineering Ireland include:
- | | |
|-------|---|
| BN009 | Bachelor of Engineering in Mechatronics |
| BN012 | Bachelor of Engineering in Computer Engineering |
- 9.10. A recurring theme of soft skills presented itself throughout the discussion. The panel suggested that a generic module may be a more efficient delivery method across multiple programmes and departments.
- 9.11. Assessment strategy was considered, and in particular, how assessments are linked to learning outcomes. The issue of over assessment was also discussed, particularly in the context of a semesterised programme with a considerable percentage of modules, in their entirety or part thereof, given to continuous assessment. The need for a timetabled matrix of assessments and the inclusion of same within course handbooks was raised, also clarification regarding what learning outcomes are assessed by continuous assessment as opposed to final exam. The issue of duplication of assessment of the learning outcomes across exam and continuous assessment was discussed. Endeavours by staff of the department of informatics to populate Coursebuilder⁴ were commended as the panel felt that it facilitated the linking of learning outcomes to assessments and provided a clear and transparent resource for students, both current and prospective on programme content and assessment breakdown. The panel strongly encouraged similar endeavours across all departments.

⁴ A curriculum management solution for managing the design, delivery, publication, and quality of information on educational programmes including indicative content, workload, learning outcomes, reading materials and assessment requirements.

10. Panel session IV(i): Review of programmes within the Department of Informatics (including the creative digital media suite of programmes)

Panel composition:

1. Dr. Adam Winstanley – Chair
2. Dr. Deirdre Lillis
3. Mr. Simon Perkins
4. Mr. Martin Duffy
5. Mr. Michael Keane, QA Officer ITB - Secretary

- 10.1. The panel complemented the staff on the clarity, presentation and readability of the documentation provided.

10.2. Computing - BN002, BN013 and BN104

It was noted that modules within the first two years of the following programmes are common: BN002, BN013 and BN104

Year 1 & 2

The web stream within the first two years of these programmes have been strengthened into a sequence of 4 modules, one module in each semester.

Credit allocation for ‘fundamentals of programming’ and ‘personal and professional development’ are being reduced to 5 credits to facilitate the introduction of a new module on ‘algorithmic problem solving’.

A New module ‘Web development 2’ will replace the ‘Databases’ module which is being moved to year 2 prompted by difficulties experienced by first year students in grasping database related topics which was found to be having a detrimental impact on project modules in later semesters. The module ‘Web Multimedia’ is being removed from year 2 to facilitate this.

The ‘Object Oriented Analysis and Design’ module is being moved from semester 4 back to semester 3 as a precursor to ‘Software Engineering and Testing’.

The ‘Switching Basics and Intermediate Routing’ module is being renamed to ‘LAN Switching and Wireless’.

The ‘Web Development (Server)’ module in semester 3 is being moved to semester 4 and renamed ‘Web Applications’ extending the content of the original offering to focus on the development of database-driven web applications whilst incorporating languages such as PHP.

Year 3 – BN302, BN013 and BN104

Credit allocation for all modules to be reduced to 5 credits with the exception of the ‘Project (Part 2)’ module worth 10 credits. This facilitates the

introduction of a new module 'Project Skills' to improve both the content and standard of project presentation.

The 'Remote Access and Wireless Networks' module is being replaced with 'Troubleshooting IP Networks' to consolidate learner's troubleshooting skills.

'Network Distributed Computing' is being moved from semester 5 to semester 6 to balance the number of end of term exams in each semester.

'XML Web Services' is being replaced with a new module 'Rich Web Applications' and will be delivered in semester 5.

'Object Oriented and Design Patterns' is being moved to semester 5 to reflect current and emerging technologies in web application development.

The 'Computer Graphics' and 'Data Mining' modules are being changed to 100% continuous assessment as they are delivered using enquiry based learning and require learners to engage in project work whereby their assessment is based entirely on the process and product that result from these activities.

'Rich Web Applications' and 'Troubleshooting IP Networks' are also to revert to 100% continuous assessment.

Year 4 – BN402 and BN104

Credit allocation for all modules will change from 6 to 5 credits with the exception of the project module which will increase to 10 credits. This will facilitate the introduction of a new module 'Research Skills' in semester 7.

In semester 7 learners will now take 5 mandatory modules, plus one elective from a choice of two.

The 'Web Services' module will be brought into semester 8 (previously year 3 level 7) with syllabus and assessment updated to reflect level 8 status.

Module title changes were also noted.

No major changes were proposed to other major/minor programmes including special purpose awards within the Department of Informatics. Specific minor amendments as proposed in the submission documents were supported.

10.3. Creative Digital Media – BN112, BN021

Credit allocation has been reduced to 5 credits for all modules with the exception of the final year project and work placement modules.

Changes proposed were presented in module streams according to the programme structure.

The content of the original offerings of 'Visual Language' and 'Design Principles and Practice' are being expanded to three modules namely 'Visual Creativity', 'Visual Communications 1' and 'Visual Communications 2'.

'Human Computer Interaction' and 'Universal Design' are being combined into a single offering and delivered as 'Universal Design' in semester 2.

'Working in Digital Media' will be moved from semester 2 to semester 5 with syllabus and assessments updated to reflect level 7 status.

The reduction in credit allocation for the group project modules in year 2 will facilitate the introduction of a new module 'Group Project Skills'.

The credit allocation for the 'Work Experience' module will be adjusted to 30 credits. This will be facilitated by dropping the 'Project Management' module the content of which will be covered within the 'Group Project Skills' module.

The 'Entrepreneurship' module in semester 7 is being moved to semester 8 with a new module 'Advanced Content Management Systems' being put in its place.

A second photography module 'Photography 2' has been added.

'Introduction to Digital Media' will revert to 100% continuous assessment.

'Digital Animation' will be moved to semester 4.

The module 'Music Technology' will be replaced by 'Post-production Techniques' in semester 8.

'Digital Marketing' will be moved to semester 5 to allow learners take advantage of this concept prior to going on placement.

11. Panel session IV(ii): Review of programmes within the Department of Engineering and Trades (including the horticulture suite of programmes)

Panel composition:

1. Dr. Dermot Douglas – Chair
2. Mr. Denis McFadden
3. Ms. Maria Kyne
4. Ms. Louise Kane
5. Dr. Diarmuid O’Callaghan, Registrar ITB – Secretary

11.1. Common 1st Year in Engineering

The panel was informed of how first year students are currently registered on either a computer engineering, mechatronics or common engineering programme and the resulting operational issues that arise as learners progress to second year. It is proposed that the first year modules on all engineering programmes are to be made common. To facilitate this:

‘Engineering Practices’ will be renamed and expanded across two modules ‘Workshop Practice 1’ in semester one and ‘Workshop Practice 2’ in the second semester.

‘Digital Electronics 1’ and ‘Digital Electronics 2’ will be combined as sufficient overlap exists in the module contents.

‘Electronic Computer Aided Design’ will be moved to year 2 semester 3

A new first year module ‘Introduction to Communications and Data Networks’ is being proposed as an introduction and support for the communications and networking modules in years two and three and to realise the standardisation of communication technology and devices throughout the manufacturing and process industries.

11.2. Computer Engineering Programmes Years 2 to 3 – BN001, BN012, BN301, BN106

‘Semiconductor Devices’ is being incorporated into third year, taken from the level 8 programme it will provide the foundation knowledge in this area necessary for further study at level 8.

In light of the recent Engineers Ireland evaluation it is proposed to review the content of ‘Software Engineering’ to reflect relevant ethical code of conduct for software engineers and rename the module ‘Object Oriented Programming’.

‘Manufacturing and Quality’ is being moved from semester 3 to semester 4 to accommodate ‘Electronic Computer Aided Design’.

The ‘Operating Systems and Computer Electronics’ module is being removed as the content will be covered in other modules.

The ‘System Architecture’ modules one and two will be combined. The content of the ‘Data Communication’ module will incorporate an introduction to digital signal processing with more emphasis being placed on wireless technologies.

Computer Engineering Programmes Years 4 and 5 – BN401, BN10?

No major changes were proposed at this time. However see section 11.8 titled “Retired programmes as part of this programmatic review”. The panel supported this initiative.

11.3. Mechatronic Programmes Years 2 to 3 – BN009, BN105

‘Electronic Computer Aided Design’ will be moved to year 2 semester 3 to allow it to be delivered in conjunction with computer engineering.

‘Electrical Power and Machines’ will move to semester 1 of year three.

‘Mechanics 1’ will be moved from year 1 to year 2 as will ‘Engineering Drawing’ with its new title ‘Computer Aided Design’. ‘Mechanics 2’ will be moved from year 1 to year 3.

The syllabi of ‘Engineering Science’, ‘Mechanics 1’, ‘Mechanics 2’ and ‘Mechanics 3’ will be reorganised with the resulting removal of ‘Mechanics 3’.

The ‘Computer Electronics’ module is being replaced with ‘Microcontrollers’ to allow for a better understanding of this technology and their application within the project module.

11.4. Mechatronic programmes years 4 and 5 – BN407, BN105

No major changes were proposed at this time. However see section 11.8 titled “Retired programmes as part of this programmatic review”. The panel supported this initiative.

11.5. BN903 – Higher Certificate in Mechatronics

The issue of adjusting the content of this programme to reflect the first two years of BN009 was discussed. The panel supported this proposal.

BN306 – Add on Bachelor of Engineering in Mechatronics

The issue of entry requirements and possible bridging modules arising from the proposal to modify the content of this programme to reflect year 3 of

BN009 were considered. The panel recommended that these be considered further in more detail.

11.6. BN039 – Bachelor of Science in Sustainable Electrical and Control Technology

No changes to module syllabi are proposed. However, the proposal to increase class contact hours in this programme was considered. The panel noted the significant increase in resources that this would require. Given other recommendations within this report relating to class contact hours the panel recommended that this proposal be revisited. The panel also heard how a one year add on honours degree is currently being developed and welcomed this progression route for existing students.

11.7. Horticulture Programmes – BN022, BN113

‘Plant Biology and Physiology’ will be brought forward into year 1 as it establishes the fundamentals of the science of horticulture. To facilitate this ‘Plant Propagation’ will be moved to year 2.

To ensure that all students learn the basic concepts of a number of different disciplines the following elective modules are being made mandatory. These include:

‘Turf grass Establishment and Maintenance 1’

‘Hard Landscape Construction’

‘Landscape Design 1’

‘Arboriculture 1’

‘Nursery Stock Production’ and ‘Protective Structures’ will be combined into a new offering that will also be mandatory.

The issue of students unable to gain/access work placement was considered and the panel recommended that a plan be developed to accommodate these to ensure that the necessary learning outcomes are met.

The issue of grading linked project modules was also discussed. The conflict between providing feedback to students in the first semester and the need to grade the overall project to determine a final grade was noted. The panel recommended that the mechanism of reporting grades to linked project modules be reviewed.

11.8 Retired programmes as part of this programmatic review

While no specific programme was terminated as part of this programmatic review the panel noted the intention to develop a new 1 year level 8 add on programme to replace the existing offerings in both computer engineering (BN401) and mechatronics (BN407). The current 2 year offerings will be

retained to accommodate existing and repeat students. Also the legacy horticulture programmes linked with the Botanic Gardens and Warrenstown College will be retained until the current student cohort has completed these programmes at which time they will be terminated. No more students will be registered on these programmes namely BN007 and BN008.

No major changes were proposed to other major/minor programmes including special purpose awards within the Department of Engineering and Trades. Specific minor amendments as proposed in the submission documents were supported.

12. Panel session V: Private panel meeting – review of day one

- 12.1. Having sub-divided into two discipline specific groups during the review of programmes the panel met to discuss their findings. Items of note include the following:

12.2. Work placement

The issue of learners being unable to gain work experience/placement was raised by the panel who recommended that a formalised plan be put in place to accommodate same.

12.3. Assessment

During discussion with the academic staff the panel sought clarification on the assessment strategy for project modules spanning across semesters and also the logic, reasoning and suitability of assessing modules 100% by continuous assessment. In relation to the re-assessment of modules with a continuous assessment component the panel recommended that an appropriate process be developed to similarly assess the learning outcomes of the continuous assessment component of the module in the repeat examination. This is to avoid unduly penalising students by forcing them to repeat the year in order to be re-assessed.

12.4. External examiners

The panel, through discussion, found engagement with external examiners relating to modules incorporating continuous assessment to be fragmented and recommended that a formal process of engagement should be established across all departments.

12.5. Rescheduling of modules

The effect of moving modules resulting from implementing changes as proposed in this review was discussed in detail. The panel was of the opinion that an implementation plan needs to be developed to accommodate same.

12.6. Online delivery

The panel also encouraged further exploration as to how online delivery may be used in a way that might allow flexibility in dealing with resource pressures while fostering student learner autonomy.

12.7. Contact hours

Class contact hours across all programmes were reviewed by the panel and considered to be excessive and not to reflect the increasing levels of independent effort/learning a student will employ as they progress from year 1 to year 4.

The panel supported the programmatic changes as proposed in the submission documents.

13. Panel session VI – Private panel meeting

The panel met on the morning of day two prior to the stakeholder meetings to discuss items outstanding/requiring further analysis from day one.

14. Panel session VII – External stakeholder meeting

The chair welcomed the industry panel members, thanked them for giving their time, outlined the purpose of the review and introduced the programmatic review panel.

Each industry stakeholder briefly introduced themselves and identified the input they had in relation to the review of programmes and their relationship with the Institute. It became evident from the discussion with the external stakeholders of the high standing ITB has not only as an educational provider, but also as a solution provider in meeting the needs of local industry. The graduate profile was discussed with weaknesses identified in the areas of mobile computing and Microsoft technologies such as .net development. System level programming skills were also identified as a potential weakness with the recent move from C++ to Java. Graduates were found to have balanced skillsets, adaptability, and good communication skills. Recommendations from the industry panel included the use of graduate portfolios as they felt they provided a better reflection of acquired skillsets. The panel also recommended that students be encouraged to participate in open source projects and competitions to broaden their exposure and increase their knowledge. The external stakeholders interviewed by the panel also encouraged ITB to further interface with small industry and explore joint applications to Science Foundation Ireland for funding. On the issue of a gap analysis on IT skills the industry panel recommended introducing a consolidated module on software engineering practice and procedures. Overall the industry panel was of the opinion that ITB is an innovative institution with professional and engaging staff producing graduates of a high calibre.

15. Panel session VIII – Student stakeholder meeting

The chair welcomed the students, thanked them for giving their time, outlined the purpose of the review and introduced the programmatic review panel.

Student involvement in the Institute's quality assurance processes was discussed. Feedback suggested a fragmented participation of student representatives at course board meetings. Some students expressed concerns relating to the current practice of providing student feedback through QA1 forms with many students professing a preference for an online alternative.

Feedback on student/staff interaction was positive. Students welcomed the changes in assessment strategy to incorporate more continuous assessment as opposed to over reliance on a final end of term exam. The issue of over assessment, the need to be cognisant of the work/life balance challenge facing mature students when timetabling assignments, plagiarism, industry accreditations and student life in general at ITB were discussed. Students expressed their dissatisfaction at the reduction/lack of student supports for problematic subjects such as mathematics and programming. Students responded positively to the idea of introducing work placements/internships. The assessment of student learning styles in first year and the alternative delivery styles such as EBL and PBL employed by academics were commended. Students noted that there was greater demands on facilities due to the rising number of students these included access to pc's, labs, library material and car parking. Overall the students reported that ITB experience was rewarding within a supportive environment.

16. Tour of facilities

The Institutes e-learning coordinator gave a presentation to the panel on the moodle virtual learning environment and Adobe Connect virtual classroom system used to deliver distance and part-time education on a range of programmes throughout the Institute. The creative digital media team presented to the panel a range of state-of-the-art equipment, including two fully equipped Mac labs complete with industry standard audio, video, multimedia and graphics software, SLR digital cameras, high definition camcorders and a range of audio and video hardware. The panel was also presented with a broad range of student projects from the Creative Digital Media showcase website <http://www.creativedigitalmedia.ie/> including stop-motion animated movies, photography portfolios, graphic design projects, short-film assignments, web-design projects, animations and digital imaging pieces.

17. Panel session IX: Stakeholder feedback analysis/review findings

The panel reviewed the stakeholder feedback and were impressed with the membership of both stakeholder groups complementing the broad spectrum of industry representatives who took time out of their busy schedules to contribute. The findings of the panel were summarised by the chair and opened for final discussion.

18. Panel session X: Decision of the panel

The chair welcomed the President, Head of School and Heads of Departments, thanked them on behalf of the panel for the hospitality they had received and the professional manner in which the review was conducted. The panel commended the high quality of the documentation submitted for review, the open and frank dialog and enthusiasm of both staff and students and the dedication of staff to the ethos of continuous improvement.

The panel recommended all proposed changes for approval for a period of 5 years subject to the following specific recommendations:

18.1. Class contact hours

The panel was of the opinion that contact hours as presented were too high and do not reflect sector or international norms and the increasing levels of independent effort/learning a student will employ as they progress from year 1 to year 4.

The contact hours column on the all approved course schedules should be parsed to reflect:

- Staff/student contact hours
- Total student workload

This is to illustrate how the student is intended to take ownership of their learning as they progress throughout the programme.

18.2. Continuous assessment

The panel welcomed the more creative and varied forms of assessment in the new curriculum provided but recommended the following:

- Clearly articulate learning outcomes assessed by specific pieces of continuous assessment and the final exam.
- Develop appropriate processes to accommodate students repeating the continuous assessment component in Autumn repeats.
- Formalise the process of engagement with external examiners in relation to modules with significant component of continuous assessment to identify and provide deliverables to external examiner for inspection.

18.3. Retention rates

The panel identified this as an issue of concern particularly within first year and recommend further analysis, monitoring and remedial action.

18.4. Course boards

With regard to course boards the panel found the approach taken, in some cases, to be inconsistent with Institute policy and recommended the following:

- External examiner reports should be forwarded to course boards and discussed with recommendations where feasible adopted.
- Disseminate scheduling and timetable of course board meetings to all stakeholders.
- Class representative attendance should be mandatory.
- Develop and implement a mechanism to provide feedback to students relating to issues raised at course boards.

18.5. Online learning

The panel was of the opinion that a school strategy for online learning be developed and recommended that at least one online module, where feasible, be offered for each year of every programme by the time of the next programmatic review.

18.6. Work placement/internship

Promote and explore the opportunity to offer work placement/internships within honours degree programmes across all departments. Where work placement is embedded in a programme the panel identified the need to formalise a backup alternative to accommodate students unable to access/partake in work placement to ensure that the necessary learning outcomes are met.

18.7. Assessment strategy

Devise an assessment strategy per programme incorporating a varied and creative assessment approach taking into consideration the workload and work-life balance of the varied student cohorts. Promote the use of 'Coursebuilder' to link learning outcomes to assessments and include a matrix of the assessment schedule in course handbooks given to students. Further clarification to be provided to students on the assessment breakdown of cross semester modules including projects was also recommended.

18.8. Quality assurance – student feedback

Extend the spread of good practice in terms of the use of the QA forms. To encourage greater feedback the panel recommended that "QA3 Institutes of Technology Department Survey of Students" be made available to students for completion online.

18.9. Industry accreditation

Promote and further explore how students may access opportunities for industry accreditation in parallel with their programmes of study. Review

curriculum against international benchmarking for the purpose of professional accreditation. The panel recommended that potential professional certification existing within programmes be made more visible.

18.10. Module rescheduling on course schedules

Develop an implementation plan to cater for modules being rescheduled from one academic term/year to another in order to facilitate existing students.

18.11. Student supports

Electronic resources developed throughout the Institute need to be made available to all students experiencing difficulties in problematic subjects such as mathematics.

18.12. Industrial liaison board

The panel recommended that the establishment of an industrial liaison board with local industry be considered.

18.13. Plagiarism

Promote student use of “Turn it in” to enhance their awareness of and to discourage plagiarism.

18.14. The strategic student

Develop the concept of the “strategic student” within the overall programme experience. Support the student in determining who they are and where they fit in their programme in preparation for employment. The programme material could include potential career trajectories with support to make sense of various options as student progress through their programmes (“scaffold the knowledge”).

18.15. Titles of special purpose awards

Remove the NFQ level and ECTS credits from the title of special purpose awards.

18.16. Issues identified by the panel that require further clarification and consideration

The panel recommended that these be reconsidered and responded to including:

- BN306 (see section 11.5)
- BN039 (see section 11.6)
- How marks are allocated to linked project modules
- Generic common module on soft skills

19. Panel observations

The panel complimented staff on the following:

- Enthusiastic and constructive commitment and participation in this review by students and staff;
- Quality of documentation provided to the review group, including a comprehensive self-evaluation with strong swot analysis;
- Successful industry links;
- Interdepartmental cooperation and collaboration between staff;
- High level of research activity.

20. Panel signatures**Chairperson**

Dr. Dermot Douglas _____ Date _____

Secretary

Dr. Diarmuid O'Callaghan _____ Date _____

Appendix

Programmes re-certified for a further five years:

Department of Informatics

BN518	BN_KMSIT_R	Master of Science in Computing	NFQ Level 9 90 ECTS credits
BN517	BN_KMSIT_G	Postgraduate Diploma in Science in Computing	NFQ Level 9 60 ECTS credits
BN512	BN_KMSCI_R	Master of Science in Computing	NFQ Level 9 60 ECTS credits
BN509	BN_KCOMP_G	Higher Diploma in Science in Computing	NFQ Level 8 60 ECTS credits
BN104	BN_KCOMP_8	Bachelor of Science (Honours) in Computing	NFQ Level 8 240 ECTS credits
BN002	BN_KCOMP_C	Higher Certificate in Science in Computing in Information Technology	NFQ Level 6 120 ECTS credits
BN013	BN_KCOMP_7	Bachelor of Science in Computing in Information Technology	NFQ Level 7 180 ECTS credits
BN302	BN_KCOMP_D	Bachelor of Science in Computing in Information Technology	NFQ Level 7 60 ECTS credits
BN402	BN_KCOMP_B	Bachelor of Science (Honours) in Computing in Information Technology	NFQ Level 8 60 ECTS credits
BN120	BN_KISDF_8	Bachelor of Science (Honours) in Computing in Information Security and Digital Forensics	NFQ Level 8 240 ECTS credits
BN034	BN_KISDF_7	Bachelor of Science in Computing in Information Security and Digital Forensics	NFQ Level 7 180 ECTS credits
BN311	BN_KISDF_D	Bachelor of Science in Computing in Information Security and Digital Forensics	NFQ Level 7 60 ECTS credits
BN420	BN_KISDF_B	Bachelor of Science (Honours) in Computing in Information Security and Digital Forensics	NFQ Level 8 60 ECTS credits
BN116	BN_KCFSM_8	Bachelor of Science (Honours) in Computer Systems Management	NFQ Level 8 240 ECTS credits
BN027	BN_KCFSM_7	Bachelor of Science in Computer Systems Management	NFQ Level 7 180 ECTS credits
BN026	BN_KCFSM_C	Higher Certificate in Science in Computer Systems Management	NFQ Level 6 120 ECTS credits
BN308	BN_KCFSM_D	Bachelor of Science in Computer Systems Management	NFQ Level 7 60 ECTS credits
BN416	BN_KCFSM_B	Bachelor of Science (Honours) in Computer Systems Management	NFQ Level 8 60 ECTS credits
BN900	BN_KITSU_C	Higher Certificate in Science in Information Technology Support	NFQ Level 6 120 ECTS credits
BN900A	BN_KITSU_CA	Higher Certificate in Science in Information Technology Support	NFQ Level 6 (128 credits)
BN930	BN_KITSU_D	Bachelor of Science in Computing in Information Technology Support	NFQ Level 7 60 ECTS credits
BN950	BN_KCSMT_B	Bachelor of Science (Honours) in Computer Services Management	NFQ Level 8 60 ECTS credits

Department of Engineering and Trades

BN523	BN_EMSTE_R	Master of Science in Technology Entrepreneurship	NFQ Level 9 90 ECTS credits
BN524	BN_EMSTE_G	Postgraduate Diploma in Science in Technology Entrepreneurship	NFQ Level 9 60 ECTS credits
BN106	BN_EELTC_8	Bachelor of Engineering (Honours) in Computer Engineering	NFQ Level 8 300 ECTS credits
BN012	BN_EELTC_7	Bachelor of Engineering in Computer Engineering	NFQ Level 7 180 ECTS credits
BN001	BN_EELTC_C	Higher Certificate in Engineering in Electronics and Computer Engineering	NFQ Level 6 120 ECTS credits
BN301	BN_EELTC_D	Bachelor of Engineering in Computer Engineering	NFQ Level 7 60 ECTS credits
BN401	BN_EELTC_B	Bachelor of Engineering (Honours) in Computer Engineering	NFQ Level 8 120 ECTS credits
BN105	BN_EMECH_8	Bachelor of Engineering (Honours) in Mechatronics	NFQ Level 8 300 ECTS credits
BN009	BN_EMECH_D	Bachelor of Engineering in Computer Engineering	NFQ Level 7 180 ECTS credits
BN407	BN_EMECH_B	Bachelor of Engineering (Honours) in Mechatronics	NFQ Level 8 120 ECTS credits
BN903	BN_EMECH_C	Higher Certificate in Engineering in Mechatronics	NFQ Level 6 120 ECTS credits
BN306	BN_EMECC_D	Bachelor of Engineering in Mechatronics	NFQ Level 7 60 ECTS credits
BN039	BN_ESECT_7	Bachelor of Science in Sustainable Electrical and Control Technology	NFQ Level 7 180 ECTS credits
BN035	BN_ESECT_C	Higher Certificate in Science in Electrical Technology	NFQ Level 6 120 ECTS credits
BN312	BN_ESECT_D	Bachelor of Science in Sustainable Electrical and Control Technology	NFQ Level 7 60 ECTS credits
BN417	BN_EBSEE_B	Bachelor of Science (Honours) in Entrepreneurship in Engineering	NFQ Level 8 60 ECTS credits
BN421	BN_EBSEI_B	Bachelor of Science (Honours) in Entrepreneurship in Information Technology	NFQ Level 8 60 ECTS credits
BN419	BN_EBSEH_B	Bachelor of Science (Honours) in Entrepreneurship in Horticulture	NFQ Level 8 60 ECTS credits
BN717	BN_EMECH_XME	Certificate in Engineering. Minor award of the Bachelor of Engineering in Mechatronics – Level 6 25 ECTS credits	NFQ Level 6 25 ECTS credits
BN718	BN_EMECH_X3D	Certificate in Computer Aided Design and Manufacturing. Minor award of the Bachelor of Engineering (Honours) in Mechatronics - Level 8 15 ECTS credits	NFQ Level 8 15 ECTS credits

Centre for Multidisciplinary Studies

BN112	BN_DDMED_8	Bachelor of Arts (Honours) in Creative Digital Media	NFQ Level 8 240 ECTS credits
BN021	BN_DDMED_7	Bachelor of Arts in Creative Digital Media	NFQ Level 7 180 ECTS credits
BN413	BN_DDMED_B	Bachelor of Arts (Honours) in Creative Digital Media	NFQ Level 8 60 ECTS credits
BN746	BN_DDMED_XWC	Certificate in Creative Web Communication. Minor award of the Bachelor of Arts (Honours) in Creative Digital Media - Level 6	NFQ Level 6 30 ECTS credits
BN748	BN_DDMED_XDI	Certificate in Creative Digital Imaging. Minor award of the Bachelor of Arts (Honours) in Creative Digital Media - Level 6	NFQ Level 6 20 ECTS credits
BN113	BN_SHTSC_8	Bachelor of Science (Honours) in Horticulture	NFQ Level 8 240 ECTS credits
BN022	BN_SHTSC_7	Bachelor of Science in Horticulture	NFQ Level 7 180 ECTS credits
BN406	BN_SHTSC_B	Bachelor of Science (Honours) in Horticulture	NFQ Level 8 60 ECTS credits
BN007	BN_SHORW_D	Bachelor of Science in Horticulture	NFQ Level 7 180 ECTS credits
BN008	BN_SHORB_D	Bachelor of Science in Horticulture	NFQ Level 7 180 ECTS credits
BN907	BN_SHORK_D	Bachelor of Science in Horticulture (Work based)	NFQ Level 7 180 ECTS credits
BN749	BN_SHTSC_XPS	Certificate in Plant Studies. Minor award of the Bachelor of Science (Honours) in Horticulture - Level 6	NFQ Level 6 20 ECTS credits

Special Purpose Awards

BN701	BN_KCCNA_Q	Certificate in CISCO-CCNA
BN702	BN_KCCNP_Q	Certificate in CISCO-CCNP
BN703	BN_KITES_Q	Certificate in CISCO IT Essentials
BN705	BN_KNSEC_Q	Certificate in CISCO Network Security 1
BN706	BN_KNPLUS_Q	Certificate in CompTIA Network +
BN707	BN_KAPLUS_Q	Certificate in CompTIA A+
BN708	BN_KPCMN_Q	Certificate in PC Maintenance and Networking
BN719	BN_KNSC2_Q	Certificate in Cisco Network Security 2
BN720	BN_KEHAC_Q	Certificate in EC-Council Certified Ethical Hacker
BN724	BN_KCSVP_Q	Certificate in CompTIA Server+
BN725	BN_KSCJP_Q	Certificate in Sun Certified Java Programmer
BN726	BN_KSCJD_Q	Certificate in Sun Certified Java Developer
BN727	BN_KCSCP_Q	Certificate in CompTIA Security+
BN728	BN_KMCTS_Q	Certificate in Microsoft Certified Technology Specialist: .NET Framework Windows Applications
BN729	BN_KMCDA_Q	Certificate in Microsoft Certified Database Administrator
BN731	BN_EEDRT_Q	Certificate in Energy Efficient Domestic Retrofit Technology
BN732	BN_EEEHS_Q	Certificate in Energy Efficient Heating Systems
BN733	BN_ECEBL_Q	Certificate in Enquiry Based Learning
BN737	BN_KCNAS_Q	Certificate in CCNA Security
BN738	BN_KCNAV_Q	Certificate in CCNA Voice
BN739	BN_KCNAW_Q	Certificate in CCNA Wireless
BN740	BN_KDHTI_Q	Certificate in CEA-CompTIA Digital Home Technology Integrator Plus (DHTI+)

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