

## Bachelor of Technology (Hons) in Electronics (BTEL)

### New Programme Structure and Table of Equivalency of Courses (effective January 2014 Semester)

#### Important Notes:

- This document contains the new Programme Structure (page 2 – 6) for BTEL programme which will be implemented effective January 2014 semester.
- All new BTEL students (from January 2014 intake onwards) are required to follow the new programme structure.
- All continuing students (from January 2007 till July 2013 intakes) are required to follow the programme structure as described below:

#### Mata Pelajaran Wajib (MPW) Courses

- Continuing students have till July 2015 semester to complete their MPW courses, failing which they may have to take **all** Mata Pelajaran Pengajaran Umum (MPU) courses instead.

#### University Compulsory Courses

- Continuing students have till July 2015 semester to complete their University Compulsory courses in the old structure failing which they may have to take the University Compulsory courses in the new programme structure instead.

#### Basic Major, Core Major and Elective Courses

- Continuing students are required to follow the new programme structure.
- However, continuing students who have taken and passed courses in previous semesters based on the old programme structure will not be disadvantaged as you will be accorded courses that are deemed equivalent in the new structure. The same will apply to those who have obtained course exemptions.

- The table of Equivalency of Courses is shown in page 7 – 13.

### Summary of the Old and New BTEL Programme Structure

#### a) Total Number of Courses

Total number of courses in the old programme structure : 26 courses

Total number of courses in the new programme structure: 28 courses

#### b) Total Credit hours

Total number of credits required to be completed in the old programme structure : 120 / 123 credits

Total number of credits required to be completed in the new programme structure: 124 credits

#### c) Graduation requirements

Total number of credits required for graduation : 120 credits (for students from the January 2007 till January 2010 intakes)

Total number of credits required for graduation : 123 credits (for students from the July 2010 till July 2013 intakes)

Total number of credits required for graduation : 124 credits (for students from the January 2014 intake onwards)

## A) BTEL – Programme Structure

### 1) MPW / MPU COURSES

- All students who joined beginning January 2014 intake are required to take MPU courses (and not MPWs).
- Students prior to January 2014 intake have till July 2015 semester to complete their MPW courses, failing which they may have to take **all** MPU courses instead.

Total number of credits required to be completed in old programme structure (MPW courses) : 9 credits

Total number of credits required to be completed in new programme structure (MPU courses) : 14 credits

The table below only shows the MPU courses in the new programme structure as compared to MPW courses in the old structure.

OLD Programme Structure				NEW Programme Structure			
Course Code	Course Title	Credits	Advisory Pre-requisite	Course Code	Course Title	Credits	Advisory Pre-requisite
WLA101/03 WLA102/03	Bahasa Kebangsaan A <b>or</b> Bahasa Kebangsaan B	3	None		<b>Removed from the new structure</b>		
WLA103/03	Malaysian Studies	3	None		<b>Removed from the new structure</b>		
WLA104/03 WLA105/03	Pengajian Islam <b>or</b> Pendidikan Moral	3	None		<b>Removed from the new structure</b>		
-	-	-	-	MPU3213/03 MPU3223/03	Bahasa Kebangsaan A (for candidates without credit in BM at SPM), <b>or</b> Decision Making Skills (for candidates with credit in BM at SPM)	3	None
-	-	-	-	MPU3113/03	Hubungan Etnik	3	None
-	-	-	-	MPU3123/03	Tamadun Islam dan Tamadun Asia	3	None
-	-	-	-	MPU3313/03 MPU3323/03 MPU3333/03	Comparative Religions, <b>or</b> Parenting and Family Issues, <b>or</b> Human Rights	3	None
-	-	-	-	MPU3412/02	Co-Curriculum	2	None

## A) BTEL – Programme Structure

### 2) UNIVERSITY COMPULSORY COURSES (Take All)

- All students who joined beginning January 2014 intake are required to take the University Compulsory courses in the new structure.
- Students prior to January 2014 intake have till July 2015 semester to complete their University Compulsory courses in the old structure failing which they may have to take the University Compulsory courses in the new structure instead.

Total number of credits required to be completed in old programme structure : 24 credits

Total number of credits required to be completed in new programme structure : 20 credits

The table below only shows the University Compulsory courses in the new programme structure as compared to the old structure. However, to check for equivalency, please refer to the table of equivalency separately.

OLD Programme Structure				NEW Programme Structure			
Course Code	Course Title	Credits	Advisory Pre-requisite	Course Code	Course Title	Credits	Advisory Pre-requisite
-	-	-	-	WUC107/03	Workplace Communication Skills	3	None
WUC106/05	Communication Skills for the Workplace	5	None		<b>Removed from the new structure</b>		
WUC111/03	Foundation Mathematics	3	None	WUC111/03	Foundation Mathematics	3	None
WUC114/05	University Mathematics A	5	WUC111/03	WUC114/05	University Mathematics A	5	WUC111/03
WUC121/03 or WUC117/03	Basic Computing and the Internet, or Introduction to Computing and Internet	3	None	WUC117/03	Introduction to Computing and Internet	3	None
WUC131/03	Learning Skills for University Studies	3	None	WUC131/03	Learning Skills for University Studies	3	None
WUC202/05	Advanced Writing Skills for University Studies	5	None		<b>Removed from the new structure</b>		
-	-	-	-	WUC203/03	Writing Skills for University Studies	3	None

## A) BTEL – Programme Structure

### 3) BASIC MAJOR COURSES (Take All)

Total number of credits required to be completed in old programme structure : 45 credits

Total number of credits required to be completed in new programme structure : 40 credits

The table below only shows the Basic Major courses in the new programme structure as compared to the old structure. However, to check for equivalency, please refer to the table of equivalency separately.

OLD Programme Structure				NEW Programme Structure			
Course Code	Course Title	Credits	Advisory Pre-requisite	Course Code	Course Title	Credits	Advisory Pre-requisite
-	-	-	-	TCC238/05	Structured Programming	5	None
TCC121/05	Programming Fundamentals with Java	5	WUC121/03 or WUC117/03		<b>Removed from the new structure</b>		
TCC221/05	Computer Organisation	5	TCC121/05		<b>Removed from the new structure</b>		
TEE101/05	Engineering Mathematics I	5	WUC114/05	TEE101/05	Engineering Mathematics I	5	WUC114/05
TEE103/05	Logic Circuits	5	WUC114/05		<b>Removed from the new structure</b>		
TEE202/05	Engineering Mathematics II	5	WUC114/05	TEE202/05	Engineering Mathematics II	5	WUC114/05
TEE204/05	Electronics Principles	5	WUC114/05	TEE201/05	Electrical Circuits and Power	5	WUC114/05
TEE205/05	Digital Design	5	TEE103/05 & TEE204/05	TEE206/05	Digital Electronics	5	WUC114/05
TEE207/05	Analog Circuits	5	TEE204/05	TEE208/05	Analog Electronics	5	TEE201/05
-	-	-	-	TEE209/05	Field Theory	5	TEE101/05
TEE301/05	Signals and Systems	5	TEE202/05	TEE301/05	Signals and Systems	5	TEE202/05

## A) BTEL – Programme Structure

### 4) CORE MAJOR COURSES (Take All)

Total number of credits required to be completed in old programme structure : 35 credits

Total number of credits required to be completed in new programme structure : 40 credits

The table below only shows the Core Major courses in the new programme structure as compared to the old structure. However, to check for equivalency, please refer to the table of equivalency separately.

OLD Programme Structure				NEW Programme Structure			
Course Code	Course Title	Credits	Advisory Pre-requisite	Course Code	Course Title	Credits	Advisory Pre-requisite
TCC238/05	Structured Programming	5	None		<b>Offered as Basic Major in the new structure</b>		
-	-	-	-	TEE314/05	Microelectronics	5	TEL204/05
-	-	-	-	TEL202/05	Power Electronics and Drives	5	TEE201/05 & TEE208/05
TEL301/05	Solid State Semiconductor Devices	5	TEE101/05 or TEE203/05	TEL204/05	Semiconductor Device Physics	5	TEE101/05 & TEE209/05
TEL302/05	Control Systems	5	TEE301/05	TEL302/05	Control Systems	5	TEL203/05 & TEE301/05
TEL303/05 or TEL203/05	Instrumentation and Measurement Techniques or Process Control and Instrumentation	5	TEE101/05, TEE202/05, TEE204/05 & TEE207/05	TEL203/05	Process Control and Instrumentation	5	TEE101/05, TEE202/05, TEE201/05 & TEE208/05
TEL304/05	Microprocessor	5	TEE205/05	TEL305/05	Microprocessor and Microcontroller	5	TEE206/05
TEL309/10	EL Project	10	Completed 90 Credits	TEL309/10	EL Project	10	Completed 90 Credits

## A) BTEL – Programme Structure

### 5) ELECTIVE COURSES (Take any 2 courses)

Total number of credits required to be completed in old programme structure : 10 credits

Total number of credits required to be completed in new programme structure : 10 credits

The table below only shows the Elective courses in the new programme structure as compared to the old structure. However, to check for equivalency, please refer to the table of equivalency separately.

OLD Programme Structure				NEW Programme Structure			
Course Code	Course Title	Credits	Advisory Pre-requisite	Course Code	Course Title	Credits	Advisory Pre-requisite
TCC222/05	Operating Systems	5	None		Removed from the new structure		
TCC239/05	Problem Solving with Object in Java	5	TCC121/05		Removed from the new structure		
TEE203/05	Discovering Physics and Chemistry	5	None		Removed from the new structure		
TEE209/05	Field Theory	5	TEE101/05		Offered as Basic Major in the new structure		
TEE210/05	Electronics Technology	5	None		Removed from the new structure		
TEE211/05	Quality and Reliability	5	None		Removed from the new structure		
TEE212/05	Information Theory	5	None		Removed from the new structure		
TEE314/05	Microelectronics	5	TEL301/05		Offered as Core Major in the new structure		
TEE315/05	VLSI Design	5	TEL301/05 & TEE314/05	TEE315/05	VLSI Design	5	TEL204/05 & TEE314/05
-	-	-	-	BBM103/05	Principles and Practice of Management	5	None
-	-	-	-	BBM210/05	Entrepreneurship Development	5	None
-	-	-	-	TMT305/05	Fundamentals of Multimedia Technology	5	None
-	-	-	-	TIC301/05	Digital Communications	5	TEE301/05

## B) BTEL – Table of Equivalency of Courses

### 1) MPW/MPU COURSES

- All students who joined beginning January 2014 intake are required to take MPU courses (and not MPWs).
- Students prior to January 2014 intake have till July 2015 semester to complete their MPW courses, failing which they may have to take **all** MPU courses instead. You are strongly encouraged to take and pass the MPW courses by the year 2015.
- Please note that MPW courses are not allowed to be taken as equivalence to MPU courses.

### 2) UNIVERSITY COMPULSORY COURSES

- All students who joined beginning January 2014 intake are required to take the University Compulsory courses in the new structure.
- Students prior to January 2014 intake have till July 2015 semester to complete their University Compulsory courses in the old structure failing which they may have to take the University Compulsory courses in the new structure instead. You are strongly encouraged to take and pass the University Compulsory courses by the year 2015.

## B) BTEL – Table of Equivalency of Courses

## 3) BASIC MAJOR COURSES

If you have been exempted and/or taken and passed the following courses in the OLD Programme Structure			You are exempted from these courses that are deemed equivalent in the NEW Programme Structure			Remarks
Course Code	Course Title	Credits	Course Code	Course Title	Credits	
TCC121/05	Programming Fundamentals with Java	5	TCC238/05	Structured Programming	5	<ul style="list-style-type: none"> <li>TCC238/05 is previously a core major course in the old programme structure but it is now offered as a <b>basic major</b> in the new programme structure.</li> <li>TCC121/05 will no longer be offered in the new programme structure.</li> <li>Students who have been exempted or have taken and passed TCC121/05 in the old programme structure are not required to take TCC238/05 in the new programme structure.</li> </ul>
TCC221/05	Computer Organisation	5	TEE209/05	Field Theory	5	<ul style="list-style-type: none"> <li>TEE209/05 is previously an elective course in the old programme structure but it is now offered as a <b>basic major</b> in the new programme structure.</li> <li>TCC221/05 will no longer be offered in the new programme structure.</li> <li>Students who have been exempted and/or have taken and passed TCC221/05 are not required to take TEE209/05 in the new programme structure.</li> <li>Students who have not been exempted from and/or have not taken TCC221/05 but have taken TEE209/05 as an elective in the old programme structure are not required to take TEE209/05 again. However, they are required to take another elective course in the new programme structure as replacement.</li> </ul>
TEE103/05	Logic Circuits	5	-	-	-	<ul style="list-style-type: none"> <li>TEE103/05 will no longer be offered in the new programme structure.</li> <li>Students who have been exempted from and/or taken and passed TEE103/05 in the old structure are exempted from taking TEL202/05 (core major) in the new programme structure.</li> </ul>
TEE204/05	Electronics Principles	5	TEE201/05	Electrical Circuits and Power	5	<ul style="list-style-type: none"> <li>TEE204/05 is revised into TEE201/05 in the new programme structure.</li> <li>Students who have been exempted and/or taken and passed TEE204/05 in the old programme structure are not required to take TEE201/05.</li> </ul>



## B) BTEL – Table of Equivalency of Courses

## 3) BASIC MAJOR COURSES (continued)

If you have been exempted and/or taken and passed the following courses in the OLD Programme Structure			You are exempted from these courses that are deemed equivalent in the NEW Programme Structure			Remarks
Course Code	Course Title	Credits	Course Code	Course Title	Credits	
TEE205/05	Digital Design	5	TEE206/05	Digital Electronics	5	<ul style="list-style-type: none"> <li>• TEE103/05 and TEE205/05 are revised into TEE206/05 in the new programme structure.</li> <li>• Students who have been exempted and/or taken and passed TEE103/05 and TEE205/05 in the old programme structure are not required to take TEE206/05.</li> <li>• Students who have been exempted and/or taken and passed TEE103/05 in the old programme structure, but have not taken and passed TEE205/05 are required to take TEE206/05 in the new programme structure.</li> <li>• Students who have been exempted and/or taken and passed TEE205/05 in the old programme structure, but have not taken and passed TEE103/05 are not required to take TEE206/05 in the new programme structure. However, they are required to take TEL202/05 (core major) in the new programme structure.</li> </ul>
TEE207/05	Analog Circuits	5	TEE208/05	Analog Electronics	5	<ul style="list-style-type: none"> <li>• TEE207/05 is revised into TEE208/05 in the new programme structure.</li> <li>• Students who have been exempted and/or taken and passed TEE207/05 in the old programme structure are not required to take TEE208/05.</li> </ul>

## B) BTEL – Table of Equivalency of Courses

## 4) CORE MAJOR COURSES

If you have been exempted and/or taken and passed the following courses in the OLD Programme Structure			You are exempted from these courses that are deemed equivalent in the NEW Programme Structure			Remarks
Course Code	Course Title	Credits	Course Code	Course Title	Credits	
-	-	-	TEL202/05	Power Electronics and Drives	5	<ul style="list-style-type: none"> <li>TEL202/05 is a new course introduced into the new programme structure.</li> <li>Students who have been exempted from and/or taken and passed TEE103/05 in the old programme structure are exempted from taking TEL202/05.</li> </ul>
TCC238/05	Structured Programming	5	TEE314/05	Microelectronics	5	<ul style="list-style-type: none"> <li>TEE314/05 is previously an elective course in the old programme structure but it is now offered as a <b>core major</b> in the new programme structure.</li> <li>Students who have been exempted and/or taken and passed TCC238/05 and TCC121/05 (basic major) in the old programme structure are not required to take TEE314/05 in the new programme structure.</li> <li>However, students who have not been exempted from and/or have not taken TCC121/05 (basic major) but have been exempted and/or taken and passed TCC238/05 in the old programme structure are required to take TEE314/05 in the new programme structure.</li> <li>Students who have been exempted and/or taken and passed TEE314/05 as an elective in the old programme structure are not required to take TEE314/05 in the new programme structure. However, students are required to take another elective from the new programme structure as replacement.</li> </ul>
TEL303/05	Instrumentation and Measurement Techniques	5	TEL203/05	Process Control and Instrumentation	5	<ul style="list-style-type: none"> <li>TEL303/05 is revised into TEL203/05 in the new programme structure.</li> <li>Students who have been exempted and/or taken and passed TEL303/05 in the old programme structure are not required to take TEL203/05 in the new programme structure.</li> </ul>
TEL301/05	Solid State Semiconductor Devices	5	TEL204/05	Semiconductor Device Physics	5	<ul style="list-style-type: none"> <li>TEL301/05 is revised into TEL204/05 in the new programme structure.</li> <li>Students who have been exempted and/or taken and passed TEL301/05 in the old programme structure are not required to take TEL204/05 in the new programme structure.</li> </ul>
TEL304/05	Microprocessor	5	TEL305/05	Microprocessor and Microcontroller	5	<ul style="list-style-type: none"> <li>TEL304/05 is revised into TEL305/05 in the new programme structure.</li> <li>Students who have been exempted and/or taken and passed TEL304/05 in the old programme structure are not required to take TEL305/05 in the new programme structure.</li> </ul>

## B) BTEL – Table of Equivalency of Courses

### 5) ELECTIVE COURSES

For the elective courses selection, please follow the following instructions:-

1. Students who **have not been exempted and/or have not taken and passed** any electives in the old programme structure are required to take two electives from the new programme structure.
2. Students who **have been exempted and/or taken and passed one** elective (except for TEE209/05 or TEE314/05) in the old programme structure are required to take the second elective from the new programme structure.
3. Students who **have been exempted and/or taken and passed** two electives (except for TEE209/05 and TEE314/05) in the old programme structure are not required to take anymore electives from the new programme structure.
4. Students who **have been exempted and/or taken and passed** TEE209/05 and/or TEE314/05 as electives in the old programme structure are required to take elective(s) from the new programme structure as replacement. This is because TEE209/05 and TEE314/05 are now offered as basic major and core major respectively in the new programme structure.

## B) BTEL – Table of Equivalency of Courses

## 5) ELECTIVE COURSES

If you have been exempted and/or taken and passed the following courses in the OLD Programme Structure			You are exempted from these courses that are deemed equivalent in the NEW Programme Structure			Remarks
Course Code	Course Title	Credits	Course Code	Course Title	Credits	
TCC222/05	Operating Systems	5	-	-	-	These courses are previously offered as elective in the old programme structure. However, these courses will no longer be offered as elective in the new programme structure.
TCC239/05	Problem Solving with Object in Java	5	-	-	-	
TEE203/03	Discovering Physics and Chemistry	5	-	-	-	
TEE210/05	Electronics Technology	5	-	-	-	
TEE211/05	Quality and Reliability	5	-	-	-	
TEE212/05	Information Theory	5	-	-	-	
TEE209/05	Field Theory	5	-	-	-	<ul style="list-style-type: none"> <li>• TEE209/05 is previously offered as an elective in the old programme structure. However, it is now offered as a <b>basic major</b> in the new programme structure.</li> <li>• Students who have been exempted and/or taken and passed TEE209/05 as an elective in the old programme structure are not required to take TEE209/05 (basic major) in the new programme structure. However, they are required to take another elective course from the new programme structure as replacement.</li> </ul>
TEE314/05	Microelectronics	5	-	-	-	<ul style="list-style-type: none"> <li>• TEE314/05 is previously offered as an elective in the old programme structure. However, it is now offered as a <b>core major</b> in the new programme structure.</li> <li>• Students who have been exempted and/or taken and passed TEE314/05 as an elective in the old programme structure are not required to take TEE314/05 (core major) in the new programme structure. However, they are required to take another elective course from the new programme structure as replacement.</li> </ul>
TEE315/05	VLSI Design	5	TEE315/05	VLSI Design	5	Students who have been exempted and/or taken and passed TEE315/05 in the old programme structure are not required to take this course again in the new programme structure.

## B) BTEL – Table of Equivalency of Courses

## 5) ELECTIVE COURSES (continued)

If you have been exempted and/or taken and passed the following courses in the OLD Programme Structure			You are exempted from these courses that are deemed equivalent in the NEW Programme Structure			Remarks
Course Code	Course Title	Credits	Course Code	Course Title	Credits	
-	-	-	BBM103/05	Principles and Practice of Management	5	These courses are new electives offered in the new programme structure.
-	-	-	BBM210/05	Entrepreneurship Development	5	
-	-	-	TMT305/05	Fundamentals of Multimedia Technology	5	
-	-	-	TIC301/05	Digital Communications	5	