



**Bachelor of Technology  
in  
Mechatronics Technology**

**Student Handbook**

**Faculty of Industrial & Vocational Technology  
University of Vocational Technology**

**March 2015**

## **Rationale for the Mechatronics Degree:**

Mechatronics has become a key to many different products and process. Modern systems have reached a level of sophistication, which would have been hard to imagine using traditional methods. Mechatronics integrates the classical fields of mechanical engineering, electrical & electronics engineering, computer engineering and information technology to establish basic principles for a contemporary engineering design methodology. A Mechatronics concentration area in the engineering curriculum would support the synergistic integration of precision mechanical engineering, electronics control and systems thinking into the design, the commissioning, the operation, the maintenance and the repair of “intelligent” products and processes.

The importance of Mechatronics will further increase due to consumer demands, which will yield excellent job opportunities for skilled workers, technicians and engineers.

## **Admission Requirements:**

- i. NVQ level 5 in the relevant technology area (Mechatronics, Electrical, Electronics, Mechanical, Production, Automobile, Bio-Medical)  
or
- ii. HNDE, NDT, NDES, NDET or equivalent qualification in the relevant technology area specified below and acceptable to the Academic Council of the University of Vocational Technology  
or
- iii. Any other qualification which the Tertiary and Vocational Education Commission has accepted to be equivalent to NVQ level 5 or 6

Exemptions may be granted in relevant modules after a proper evaluation for those who have NVQ level 6 or equivalent qualifications. Preference will be given to those applicants having post diploma industrial experience of at least one year.

## **Student Selection:**

Eligible candidates are required to sit for aptitude test. Selection is done based on the marks obtain by the candidates.

## **Registration:**

Registration is the acceptance of the selected applicant as a student in the University. Prior to registration the applicant is issued with an offer letter for a particular academic programme along with a voucher to pay the relevant course fee, of which following may be the constituents:

- a) Registration fee – To be paid at the first registration and subsequently at re-registrations
- b) Tuition fee
- c) Facility fee
- d) Library deposit (Refundable)
- e) Library fees (nonrefundable)
- f) Laboratory fee if applicable (nonrefundable)

The letter calling for registration will request the applicant to produce the original documents of the following:

- a) School leaving certificate
- b) National Identity Card or Passport
- c) Birth Certificate
- d) Certificates of all educational qualifications
- e) Documents requested to be obtained from the employer
- f) Any other documents depending on the study programme
- g) Documentary evidence for the payment of the Registration fees, course fees, Library fees, etc.

University has no obligations to refund the above fees in case of a disqualification of an applicant for reasons due to lapse/s from the part of the applicant at the registration stage. The applicant who is duly registered for an academic programme shall become a student of the University and will receive a Student number and a Student Identification Card.

The selected candidate shall personally appear before the registration desk for registration, unless the provision is available for online registration.

## **Credit system and the Duration:**

The course structure is based on module system. Each module has been assigned a Credit Value, depending upon the number of notional hours required to achieve the outcome of the module. Notional hours include directed learning as well as self-directed learning. This system is benchmarked with the European Credit Transfer and Accumulation System (ECTS).

Duration of the degree program is 3 academic years. One academic year consists of two semesters. One semester may consist of 15 weeks for weekday programmes and 22 weekends for weekend programmes. Total notional hours per semester, is 750. A total of 25 notional hours is equal to 01 credit. Total number of credits per semester is 30.

B. Tech. in Mechatronics degree is a 3 year full time course. However, when it is conducted in part time basis it takes about 4 ½ years to complete, the degree.

## **Course Structure:**

### **Module Code:**

EE10501	-	EE	-	Department offering the module
		1	-	Semester
		04	-	Number of Credits
		01	-	Serial number of the module

### **Module Type:**

The degree consists of Compulsory (C) modules, Elective (E) modules and Optional (O) modules. Core compulsory modules and Elective modules designated as GPA modules will be used to calculate the grade point averages.

C	-	Compulsory
E	-	Elective
O	-	Optional
G	-	GPA
NG	-	Non GPA

Module Code	Module Title	Type	Credits	Year I		Year II		Year III	
				S-I	S-II	S-I	S-II	S-I	S-II
SM10480	Engineering Mathematics I	C/G	4	√					
SM10381	Engineering Physics	C/G	3	√					
EE10401	Theory of Electricity	C/G	4	√					
LS10308	Communication Skills I	C/NG	3	√					
MF10501	Workshop Technology	C/G	5	√					
EE10402	Principles of Electronics	C/G	4	√					
MF10580	Engineering Drawing	C/G	5	√					
EE10203	Software Applications	C/G	2	√					
SM20480	Engineering Mathematics II	C/G	4		√				
MF20401	Thermodynamics	C/G	4		√				
MF20402	Strengths of Materials	C/G	4		√				
EE20401	Electrical Technology	C/G	4		√				
IT20410	Computer Programming C++	C/G	4		√				
LS20308	Communication Skills II	C/NG	3		√				
MF20403	Engineering Mechanics	C/G	4		√				
EE20302	Electronics	C/G	3		√				
SM30480	Engineering Mathematics III	C/G	3			√			
MF30501	Machine Design	C/G	5			√			
MF30402	Pneumatic and Hydraulic Systems	C/G	4			√			
EE30401	Control Systems	C/G	4			√			
EE30402	Introduction to Robotics & Vision Systems	C/G	4			√			
EE30303	Introduction to communication systems	C/G	3			√			
EE30304	Sensors and Actuators	C/G	3			√			
EE30405	Electrical Machines and Drives	C/G	4			√			
SM40380	Research Methods	C/G	3				√		
EE40481	Presentation of Engineering Information	C/G	4				√		
MS40415	Industrial Economics & Management	C/G	4				√		
EE40501	PLC Programming	C/G	5				√		
EE40402	Modeling and Simulation	C/G	4				√		
EE40403	Energy Management	C/G	4				√		
EE40304	Mechanical and Electrical Measurements	C/G	3				√		
EE40405	Power Electronics	O/NG	4				√		
MS30412	Entrepreneurship Development	E/NG	2				√		
ET40290	Meditation & Stress Management	E/NG	2				√		
EE51890	Work Based/Industrial Training	C/G	18					√	
EE50201	CAD/CAM Solid modeling of components	C/G	2					√	
EE61891	Final Year Project *	C/G	18						√
EE60601	Computer Aided Design and Manufacturing	C/G	6						√
EE60302	Quality Management	C/G	3						√
EE60303	Microprocessor based systems	C/G	3						√
EE60404	Industrial Communication Systems	C/G	4						√
EE60505	Design Automated Systems	C/G	5						√
EE60306	Digital Control Systems	C/G	3						√
IT60290	Photography	E/NG	2						√
MF60204	Occupational Health and Safety	C/G	2						√

## **Work Based / Industrial Training:**

Fifth semester of the study programme is dedicated to this component of the degree. Purpose of this module is to enable students to apply competencies required through the academic programme to workplace experiences.

Students studying the degree during weekdays will be placed in various industrial establishments/worksites related to their fields of studying for a period of six months through National Apprentice and Industrial Training Authority (NAITA) under undergraduate in plant training scheme.

Those who are studying during weekends are required to undertake work based training in their places of work, under supervision of a senior officer. Work undertaken during this period should be different from the normal routine work which he/she is supposed to attend in his/her job.

## **Final Year Project:**

This module is given in the sixth semester. This is a group project, which provides opportunity for the students to enhance their ability in problem solving, team work and leadership competencies acquired, throughout the undergraduate career.

To successfully complete this module students are expected to design and implement a challenging engineering project applying realistic constraints and engineering standards within a given timeframe and present technical ideas in written and oral form effectively.

## **Course Assessment System:**

The performance of each student in each module will be evaluated by continuous assessments and a semester-end examination.

The weightings assigned for the continuous assessment component and the semester - end examination of a module will be as follows.

- \* Continuous Assessment      40% - 70%
- \* Semester - End Examination   60% - 30%

- The continuous assessment may consist of assignments, quizzes, laboratory work, practical, tutorials, demonstrations, presentations, projects, oral tests and mid semester tests. Weightings of each of these components used in the determination of the final grade for each module should be clearly conveyed in writing to the students at the commencement of each module along with the outline of the module.
- The students should maintain 80% of attendance and satisfy the requirements specified in each module descriptor to be eligible to sit for the semester-end examination.
- All Candidates should obtain at least 30% of the marks allocated for continuous assessment to get qualified to sit for the semester - end examination.

### **Grading System and Computation of Grade Point Average (GPA):**

A letter grade shall be awarded to each module. The cut-off marks for each grade and the corresponding grade points are given below.

<b>Grades</b>	<b>Marks</b>	<b>Grade Point</b>
A+	90 or above	4.00
A	80 – 89	3.70
B+	70 – 79	3.30
B	60 – 69	3.00
C+	50 – 59	2.70
C	40 – 49	2.00
D	30 – 39	1.00
E	01 – 29	0.00
F	0	0.00

1. Grade D or above is required to earn credits for a module.
2. A minimum 30% should be obtained from continuous assessment for eligibility to sit for the end semester exam.
3. A minimum requirement of 30% should be obtained from the semester - end Examination in order to obtain a grade D or above for a module.

4. A student satisfying continuous assessment requirements and getting between 1 - 29 marks for the semester end examination receives a symbol as E(ET) while a student getting 0 for the semester end examination receives symbol F(ET). A student satisfying semester end examination requirements and getting between 1 and 29 marks for the continuous assessment receives a symbol as E(CA) a student getting 0 for the continuous assessment receives symbol as F(ET). A student getting between 1 and 29 marks for both the semester end examination & the continuous assessment receives the Grade E while a student getting 0 for both the semester end examination & continuous assessment receives the Grade F. A student must repeat the part of the module examination/complete module examination having Grade E or F & must improve up to Grade D or C. The modules having Grade D are allowed to repeat only when the Semester Grade Point Average (SGPA) of a particular semester is less than 2.00. By repeating only the semester end examination/continuous assessment or both, the Grades F, E or D can be improved only up to a C grade and considered for calculating Grade Point Average (GPA). Repeating continuous assessment or semester end examination is considered as repeating the whole module.

#### **Academic Concession:**

Academic Concession may be granted to a student with the approval of the Faculty Board, in the event that a student is unable to sit for the semester-end examination due to illness or other compelling reason. In such instances the student must notify the Dean of the faculty within 48 hours of the cause. Further, the student should make an appeal with supporting documents to the Dean for an Academic Concession within one week from the date of the examination. The continuous assessment component can be carried forward to the next examination as the first attempt.



## **Semester Grade Point Average (SGPA):**

The calculation of the Semester Grade Point Average will be based on the Grade Points earned for all modules registered in a semester (except those awarded with academic concession) weighted according to number of credits. The SGPA is rounded to the nearest second decimal place. The SGPA is reported on transcripts and Statement of Results that may be issued for each semester.

The formula for calculating SGPA is given below.

$$\text{Semester GPA (SGPA)} = \frac{\Sigma (\text{Number of Credits for a semester module} \times \text{Grade point obtained for the module})}{\text{Total number of credits for the Semester}}$$

## **Final Grade Point Average (FGPA):**

The Final Grade Point Average is the absolute academic standing of the student calculated on the basis of SGPA. The FGPA will be calculated using the following formula.

$$\text{Final GPA (FGPA)} = \frac{\Sigma (\text{Semester GPA})}{\text{Number of Semesters}}$$

## **Unsatisfactory Standing on Academic Performance:**

If the student's SGPA falls between 1.99 and 1.50 the student will be placed on Academic Warning.

A student who falls into one of the following categories of the SGPA will not be permitted to register for a new module until the SGPA is upgraded to 2.00 or more.

- i. SGPA < 1.50 in any two semesters
- ii. SGPA < 1.50 in any semester and  $1.50 \leq \text{SGPA} < 2.00$  in any two semesters
- iii.  $1.50 \leq \text{SGPA} < 2.00$  in any three semesters

## **Graduation Requirements:**

### **Credit Requirements:**

A student should satisfy the following requirements in order to be admitted to the Bachelor of Technology in Mechatronics Technology.

- (i) A minimum total of 180 credits from modules specified.
- (ii) A minimum Final Grade Point Average (FGPA) of 2.00
- (iii) Any other mandatory requirement specified by the Academic Council

### **Key to Final Results (FGPA – Final Grade Point Average):**

#### **FGPA**

#### **Final Results**

3.7 or Above	First Class
3.30 – 3.69	Second Upper
2.70 – 3.29	Second Lower
2.00 – 2.69	Ordinary Pass
Below 2.00	Incomplete

