



**BANGLADESH TECHNICAL EDUCATION BOARD**

**Agargaon, Sher-E-Bangla Nagar**

**Dhaka-1207.**

**04-YEAR DIPLOMA IN ENGINEERING CURRICULUM**

**COURSE STRUCTURE & SYLLABUS**

**(PROBIDHAN-2022)**

**COMPUTER SCIENCE & TECHNOLOGY TECHNOLOGY**

**TECHNOLOGY CODE: 85**

**3<sup>rd</sup> SEMESTER**

**(Effective from 2022-2023 Academic Sessions)**

## DIPLOMA IN ENGINEERING CURRICULUM COURSE STRUCTURE

(PROBIDHAN-2022)

**TECHNOLOGY NAME: COMPUTER SCIENCE & TECHNOLOGY (85)**

(3<sup>RD</sup> SEMESTER)

Sl. No.	Subject		Period Per Week		Credit	Marks Distribution						Grand Total
						Theory Assessment			Practical Assessment			
	Code	Name	Theory	Practical		Continuous	Final	Total	Continuous	Final	Total	
1	25811	Social Science	2	-	2	40	60	100	-	-	-	100
2	25922	Physics -II	3	3	4	60	90	150	25	25	50	200
3	25931	Mathematics-III	3	3	4	60	90	150	25	25	50	200
4	28531	Application Development Using Python	2	3	3	40	60	100	25	25	50	150
5	28532	Computer Graphics Design-II	-	3	1	-	-	-	25	25	50	50
6	28533	IT Support Services	2	6	4	40	60	100	50	50	100	200
7	26831	Digital Electronics-I	2	3	3	40	60	100	25	25	50	150
<b>Total</b>			<b>14</b>	<b>21</b>	<b>21</b>	<b>280</b>	<b>420</b>	<b>700</b>	<b>175</b>	<b>175</b>	<b>350</b>	<b>1050</b>

Subject Code	Subject Name	Period per Week		Credit
28531	Basic Application Development in Python	T	P	C
		2	3	3

Rationale	To provide knowledge, skills, attitude, innovation and development of application software for the field of database, accounting, inventory control, sales management, communication management etc. using python programming language.
Learning Outcome (Theoretical)	<p>After undergoing the subject, students will be able to:</p> <ul style="list-style-type: none"> <li>• Write program using python functions</li> <li>• Write program using python file operations</li> <li>• Create modules and packages.</li> <li>• Write programs using OOP features of python.</li> <li>• Explain four pillars of OOP.</li> <li>• Write programs using pillars of OOP.</li> <li>• Write programs using python iterators, generators and decorators.</li> <li>• Describe exception &amp; error handling in python.</li> <li>• Write programs using python exception &amp; error handling.</li> <li>• State logging in python.</li> <li>• Describe unit testing of python.</li> <li>• Describe python regex.(Regular Expression).</li> <li>• Describe the usage and function of application software.</li> </ul>
Learning Outcome (Practical)	<p>After undergoing the subject, students will be able to:</p> <ul style="list-style-type: none"> <li>• Write and execute programs using functions in python.</li> <li>• Perform file operation for input and output operations in python.</li> <li>• Create python iterators, generators and decorators.</li> <li>• Write and execute programs using exceptions and errors occur in python.</li> <li>• Create module and package in python.</li> <li>• Write and execute programs using functions and OOP features of python.</li> <li>• Develop application software using functions and OOP features of python.</li> <li>• Develop database application software using python.</li> </ul>

## Detailed Syllabus (Theory)

Unit	Topics with Contents	Class (1 Period)	Final Marks
1	<b>PYTHON FUNCTIONS</b> 1.1 Define function. 1.2 Distinguish between library and users define functions. 1.3 State the procedure to call a function. 1.4 Explain passing by reference versus passing by value in function. 1.5 Describe function arguments. 1.6 Mention the uses of date and time function. 1.7 Write program using user define functions.	4	6
2	<b>FILE OPERATION IN PYTHON</b> 2.1 State file operation. 2.2 Describe the file opening mode. 2.3 Describe the file opening and closing functions. 2.4 Explain the file reading and writing functions. 2.5 Write programs using file input and output operations.	2	4
3	<b>MODULE, PACKAGE AND APPLICATION SOFTWARE</b> 3.1 Define application software. 3.2 Classify application software. 3.3 State use of application software. 3.4 Define module & package. 3.5 Describe importance of modules and packages. 3.6 Write program to create module. 3.7 Write program to create package.	2	4
4	<b>BASICS OF OOP (Object Oriented Programming)</b> 4.1 Define OOP. 4.2 State the importance of OOP. 4.3 Mention the features of OOP. 4.4 Describe classes & objects with example. 4.5 Describe basic structure of class. 4.6 Write a programs using class.	3	6
5	<b>FOUR PILLARS OF OOP</b> 5.1 Mention the four pillars of OOP. 5.2 Explain the importance of four pillars. 5.3 State inheritance with example. 5.4 Explain encapsulation with example. 5.5 Explain polymorphism with example. 5.6 Define abstraction with example. 5.7 Write programs using inheritance, polymorphism and encapsulation.	5	9
6	<b>PYTHON ITERATOR, GENERATOR AND DECORATORS</b> 6.1 Define iterator, generator and decorators 6.2 Explain the working procedure of iterator. 6.3 Describe the working procedure of generator. 6.4 Illustrate the working procedure of decorators. 6.5 Write a programs using iterator, generator and decorators.	2	4
7	<b>EXCEPTION &amp; ERROR HANDLING IN PYTHON</b> 7.1 Define exceptions in python. 7.2 Mention the built in exceptions in python. 7.3 Describe the raising an exception in python. 7.4 Explain the try and except block in python. 7.5 Illustrate else and finally clause in python. 7.6 Write programs for exception and error handling.	4	7

8	<b>LOGGING IN PYTHON</b> 8.1 Define logging in python. 8.2 Illustrate the circumstances of logging. 8.3 Mention levels of logging. 8.4 Describe the working procedure of logging. 8.5 Describe configuration and output formatting of logging.	3	5
9	<b>UNIT TESTING (unit test)</b> 9.1 Define unit testing (unit test) in python. 9.2 Describe the importance of unit testing (unit test) in python. 9.3 Explain the structure of unit testing (unit test). 9.4 Describe unit testing procedure using python built in unit test (unit test) library. 9.5 Mention requirements of the unit test to write and execute the code in python.	3	6
10	<b>PYTHON REGEX. (REGULAR EXPRESSION)</b> 10.1 Define regular expression (RegEx) in python. 10.2 Mention the built in methods in python RegEx. 10.3 Illustrate RegEx, meta characters and sequence. 10.4 Describe the working procedure of RegEx in python. 10.5 Write a programs using RegEx for searching specific word in a sentence or paragraph.	2	4
11	<b>APPLICATION SOFTWARE</b> 11.1 Define application software with example 11.2 Mention the types of application software 11.3 Illustrate the features of application software 11.4 Describe the usage of application software 11.5 Explain the function of application software	2	5
<b>Total</b>		<b>32</b>	<b>60</b>

### **Detailed Syllabus (Practical)**

Sl.	Experiment Name with Procedure	Class (3 Period)	Continuous Marks
1	<b>PREPARE INVENTORY MANAGEMENT FOR FRUITS ITEM</b> 1.1 Setup Environment 1.2 Take item data from the user. (Like fruits name, unit price, quantity and total price etc.) 1.3 Store items data into CSV(comma-separated values) file 1.4 Print fruits items summary data from stored CSV file	3	4
2	<b>GENERATE PDF REPORT FROM CSV FILE</b> 2.1 Setup Environment. 2.2 Store Student basic information into CSV file. (Student_Id, Name, Roll, Semester, Shift, Department, Date of birth, Phone no.) 2.3 Generate PDF report for all of the students from information CSV file. Example: In the report table, show students basic information.	3	4
3	<b>QR CODE &amp; BARCODE GENERATOR AND DECODING</b> 3.1 Setup Environment 3.2 Take student Id and name 3.3. Create QR and Barcode from given student Id and name (like student ID and name) 3.4 Decode QR Code and Barcode data	2	4

	3.5 Print decoded data		
4	<b>WEB SCRAPING</b> 4.1 Setup Environment 4.2 Get html source code from given any site URL (example: https://www.rokomari.com/book) 4.3 Extract some basic data (like, book name, writer name and price) from source HTML data 4.4 Save extracted data into CSV file.	3	4
5	<b>WEATHER REPORT</b> 5.1 Setup Environment 5.2 Connect with Open Weather API (url: https://openweathermap.org/api) 5.3 Take the location name from the user. like(location: Dhaka or other city name) 5.4 Get weather data from open weather api of given location name 5.5 Print basic weather data from collected weather information	2	4
6	<b>DATABASE DESIGN AND DEVELOPMENT</b> 6.1 Setup Environment 6.2 Design a simple form 6.3 Insert fields to the form 6.4 Add command buttons to the form 6.5 Write code for input, save and search data.	3	5
<b>Total</b>		<b>16</b>	<b>25</b>

### Necessary Resources (Tools and Equipment):

Sl	Item Name	Quantity
01	Computer System	50 set
02	Python Software	Installed in 50 set
03	Scanner	2 set
04	Printer	2 set

### Recommended Books: –

Sl	Book Name	Writer Name
01	পাইথন দিয়ে প্রোগ্রামিং শেখা (পেপারব্যাক)	তামিম শাহরিয়ার সুবিন
02	পাইথন দিয়ে প্রোগ্রামিং শেখা ২য় খণ্ড অবজেক্ট ওরিয়েন্টেড প্রোগ্রামিং ও ওয়েব ক্রলিং (পেপারব্যাক)	তামিম শাহরিয়ার সুবিন
03	সহজ ভাষায় পাইথন ৩ (হার্ডকভার)	মাকসুদুর রহমান ম্যাটিন
04	Hands-On Software Engineering with Python: Move Beyond basic programming and construct reliable and Efficient software with complex code	Brian Allbee

### Website References:

Sl	Web Links	Remarks
01	<a href="https://www.w3schools.com/python/">https://www.w3schools.com/python/</a>	
02	<a href="https://www.tutorialspoint.com/python/index.htm">https://www.tutorialspoint.com/python/index.htm</a>	
03	<a href="https://www.w3resource.com/python-exercises/">https://www.w3resource.com/python-exercises/</a>	
04	<a href="https://www.geeksforgeeks.org/python-programming-language/">https://www.geeksforgeeks.org/python-programming-language/</a>	
05	<a href="https://www.programiz.com/python-programming">https://www.programiz.com/python-programming</a>	