



BANGLADESH TECHNICAL EDUCATION BOARD
AGARGAON , DHAKA-1207.

4-YEARS DIPLOMA IN AGRICULTURE CURRICULUM
COURSE STRUCTURE & SYLLABUS
(PROBIDHAN-2022)

CURRICULUM CODE: 23

FIRST SEMESTER
(Effective from 2021-2022 Academic Sessions)

DIPLOMA IN AGRICULTURE (23)
COURSE STRUCTURE
PROBIDHAN-2022

1st SEMESTER

Sl. No	Subject		Period per Week		Credit	Marks Distribution						
						Theory Assessment			Practical Assessment			Grand Total
	Code	Name	Theory	Practical		Continuous	Final	Total	Continuous	Final	Total	
1	22311	Introduction to Bangladesh Agriculture	2	3	3	40	60	100	25	25	50	150
2	25711	Bangla-I	2	0	2	40	60	100	-	-	-	100
3	25712	English-I	2	0	2	40	60	100	-	-	-	100
4	25812	Physical Education and Life skills development	0	3	1	-	-	-	25	25	50	50
5	25911	Mathematics-I	3	3	4	60	90	150	25	25	50	200
6	25912	Physics-I	3	3	4	60	90	150	25	25	50	200
7	25914	Chemistry-I	2	3	3	40	60	100	25	25	50	150
8	25915	Biology-I	2	3	3	40	60	100	25	25	50	150
Total			16	18	22	320	480	800	150	150	300	1100

DIPLOMA IN AGRICULTURE (23)
SYLLABUS
PROBIDHAN-2022

1st SEMESTER

SUBJECT CODE	SUBJECT NAME	PERIOD/WEEK		CREDIT
22311	Introduction of Bangladesh Agriculture (বাংলাদেশের কৃষি পরিচিতি)	T	P	C
		2	3	3

Rationale	<p>Bangladesh is an agriculture-based country. About 70-80% peoples are dependent as directly or indirectly on agriculture. Agriculture sector contribute about 14% on GDP in Bangladesh economy. In agriculture sector, major components are crop, livestock, fisheries and forestry etc. Moreover, those sectors are classified as different aspects like agricultural education, research, extension, inputs supplier organization. So, diploma level student should have to know about the conceptual knowledge of those various organization in Bangladesh. Consequently, after the completion of this course, the student will be able to explore the acquired knowledge in their personal, real and professional life.</p>
Learning Outcome (Theoretical)	<p>After the completion of the theoretical course's student will be able to:</p> <ul style="list-style-type: none"> • Describe about the concept of agriculture and its chronological development, geographical position. • Describe the importance and necessity of agriculture • Discuss the effect of weather and climate on agriculture • Illustrate unfavorable eco-system like Hill, drought, heat, salinity, water logging, flood, haor and char, coastal agriculture of Bangladesh • Explain the classification and its development of crops, livestock, fisheries and forest resources of Bangladesh. • Describe the agricultural education institutions. • Discuss the activities, development and its continuity of Agricultural inputs suppliers' organizations in Bangladesh. • Describe development and its continuity of agricultural research Institutes in Bangladesh. • Elaborate activities, development and its continuity of different extension services organizations in Bangladesh.
Learning Outcome (Practical)	<p>After the completion of the practical course's student will be able to:</p> <ul style="list-style-type: none"> • Draw a bar graph • Draw a pie graph • Prepare a report • Know the Organogram of DAE

DETAILED SYLLABUS (THEORY)

Unit	Topics with Contents	Class (1 Period)	Final Marks
1.	Agriculture in Bangladesh 1.1 Define Agriculture. 1.2 State the importance of Agriculture. 1.3 Describe the development process of Agriculture. 1.4 Mention the Geographical Location of Bangladesh. 1.5 Mention the Land uses of Bangladesh. 1.6 Define Climate. 1.7 State the Climate effect on Agriculture. 1.8 Define Promising Crops. 1.9 List the Promising Crops in Bangladesh.	4	8
2.	Crops, Livestock, Fisheries and Forests in Bangladesh 2.1 Define Crops. 2.2 Classify Crops. 2.3 State the Development Process of Crops in Bangladesh. 2.4 Define livestock and Fisheries. 2.5 Classify livestock and Fisheries. 2.6 State the Development Process of Livestock in Bangladesh. 2.7 State the Development Process of fisheries in Bangladesh. 2.8 Define Forest resources. 2.9 Classify Forest resources. 2.10 State the Development Process of forest resources in Bangladesh.	4	8
3	Food production situation in Bangladesh 3.1 Define Graphs. 3.2 Describe different types of Graphs. 3.3 State the importance and uses of Graphs. 3.4 Describe Food grains status of Bangladesh since Independent to till. 3.5 Describe import and export of food grain status of Bangladesh since Independent to till. 3.6 Describe production of livestock status of Bangladesh since Independent to till. 3.7 Describe import and export of livestock status of Bangladesh since Independent to till. 3.8 Describe production of fisheries status of Bangladesh since Independent to till. 3.9 Describe import and export of fisheries status of Bangladesh since Independent to till. 3.10 Describe production of Forest Resource status of Bangladesh since Independent to till.	2	2
4	Multiple crops agricultural research institutes 4.1 List Multiple crops Agricultural research institutes 4.2 Mention the activities of BARI, BINA 4.3 Mention the activities of BSRI, BLRI, 4.4 Mention the activities of BFRI, BWMRI. 4.5 State the Development and continuity of BARI, BINA 4.6 State the Development and continuity of BSRI, BLR	3	6
5	Mono crop agricultural research institutes 5.1 Define Mono Crop Research institute 5.2 List Mono crops Agricultural Research institutes 5.3 State the development and continuity of BARC 5.4 List the activities of BRRI, BJRI, BTRI, SRDI 5.5 List the activities of BSRI, CDB, BARC	3	6

6	Agricultural Universities of Bangladesh 6.1 List the Public Agricultural Universities 6.2 State the development and continuity of Public Agricultural Universities 6.4 State the activities of Public Agricultural Universities 6.5 List the Agriculture related other public University 6.6 State the activities Agriculture related other public University 6.7 State the Development and continuity of agriculture related other public University 6.8 List the Veterinary Public Universities 6.9 State the activities of Veterinary Public Universities	4	8
7	Agricultural Institutes of Bangladesh 7.1 List the Diploma level Public Agricultural Training Institutes 7.2 List the Diploma level Private Agricultural Institutes (Agricultural Diploma) 7.3 List down of Fisheries Diploma Institutions. 7.4 List down of Livestock Diploma Institutions. 7.5 List down of Government and Non- Government Agricultural Vocational Education Institutions. 7.6 List down of agricultural educational institutions at secondary and higher secondary level.	3	6
8	Agricultural extension Institution 8.1 List of the agricultural extension Institution 8.2 Introduce DAE and Livestock Services 8.3 State the activities of DAE and Livestock Services 8.4 Introduce the Department of Fisheries 8.5 State the activities of Department of Fisheries 8.6 Introduce the Department of Forest Resources Extension Organization 8.7 State the activities of Department of Forest Resources Extension Organization 8.8 Define NGO 8.9 List down of Agriculture related NGOs 8.10 State the activities of Agriculture related NGOs	4	6
9	Agricultural commodity Supplier organizations. 9.1 Define Agricultural Commodity Supplier Organizations. 9.2 State the role of Bangladesh Agriculture Development Corporation (BADC) as Agricultural commodity Supplier organizations. 9.3 State the activities and contribution of Privately owned seed organization 9.4 State the activities and contribution of Privately owned pesticides 9.5 State the role of mechanization and irrigation management of Privately Owned Agricultural Machinery Manufacturers and Supplier 9.6 List of the Organizations Distributing Agricultural Loans 9.7 State the brief activities of Organizations Distributing Agricultural Loans 9.8 List of Fertilizer manufacturers in Bangladesh 9.9 State the contribution of fertilizer manufacturers in Agriculture 9.10 List down machineries using post harvest technology and Biotechnology	3	6

10	Agricultural practices in adverse conditions in Bangladesh 10.1 Location of Hilly areas in Bangladesh 10.2 Cropping system of Hilly areas in Bangladesh 10.3 State the Barriers of Hilly agriculture 10.4 Define Haor and Baor 10.5 State the problem of Haor and Baor Agriculture 10.5 Define flood and Water logging condition 10.6 State the problem of Agriculture in flood and water logging condition. 10.7 Define Drought and Heat stress. 10.8 State the adaptation in drought and heat condition. 10.9 Define Salinity 10.10 State the adaptation in salinity condition.	2	4
Total		32	60

DETAILED SYLLABUS (PRACTICAL)

Sl.	Experiment name with procedure	Class (3 Period)	Marks (Continuous)
1.	Draw a bar graph of annual rainfall and temperature based on the region of Bangladesh. 1.1 Collect necessary Tools and Equipment. 1.2 Draw a Bar Graph according to information Sheet. 1.3 Maintain the Record of Performed Task.	1	2.5
2	Prepare a table of land use in Bangladesh. 1.4 Collect necessary Tools and Equipment. 1.5 Prepare a Table according to information sheet. 1.6 Maintain the Record of Performed Task.	1	2.5
3	Draw a bar graph using data of land size and production of crops planted in Bangladesh 3.1 Collect necessary Tools and Equipment. 3.2 Prepare a bar graph according to information sheet. 3.3 Maintain the Record of Performed Task.	2	2.5
4	Draw a pie graph using the amount and contribution of animal resources in Bangladesh. 4.1 Collect necessary Tools and Equipment. 4.2 Prepare a pie graph according to information sheet. 4.3 Maintain the Record of Performed Task.	2	2.5
5	Draw a pie graph of the amount and contribution of fisheries resources in Bangladesh 5.1 Collect necessary Tools and Equipment. 5.2 Prepare a pie graph according to information sheet. 5.3 Maintain the Record of Performed Task.	2	2.5
6	Draw a bar graph using data of the amount of cultivated land and production of food grains in Bangladesh. 6.1 Collect necessary Tools and Equipment. 6.2 Prepare a bar graph according to information sheet. 6.3 Maintain the Record of Performed Task.	2	2.5

7	Visit to different Agricultural Institutions (Educational institutes/ research Institutes/ horticulture center). 7.1 Explore the resources in the visited institution. 7.2 Know the different technologies in the center. 7.3 Prepare a report on your findings.	2	5
8	Prepare a chart of organizational structure (Organogram) of the Department of Agricultural Extension. 8.1. Know the manpower of DAE 8.2 Categories the manpower of DAE. 8.3.Explore the activities of officers at every levels of DAE	2	2.5
9	Draw a Pie graph of Name and Number of Irrigation Machines Used in Bangladesh. 9.1 Collect necessary Tools and Equipment. 9.2 Prepare a pie graph according to information sheet. 9.3 Maintain the Record of Performed Task.	2	2.5
Total		16	25

NECESSARY RESOURCES (TOOLS, EQUIPMENT'S AND MACHINERY):

SI	Item Name	Quantity
01	Graph Papers, Art Papers, Pencil, Rubber, Scale, etc.	

Required Chemicals:

SI	Item Name (Consumables Materials)	Quantity
01		

RECOMMENDED BOOKS:

SI	Book Name	Writer Name	Publisher Name & Edition
01	Agriculture Extension Manual	DAE	DAE
02	Year Book of Agriculture Statistics	BBS	BBS

WEBSITE REFERENCES:

SI	Web Link	Remarks
01	www.youtube.com	Search here with topics
02	www.google.com	Search here with topics

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SUBJECT CODE	SUBJECT NAME	PERIOD/WEEK		CREDIT
25711	Bangla-1 (বাংলা-১)	T	P	C
		2	0	2

উদ্দেশ্য:

বাংলা সাহিত্য পঠন পাঠনে ডিপ্লোমা পর্যায়ের শিক্ষার্থীদের জাতীয় চেতনাবোধ, দেশপ্রেম, মুক্তিযুদ্ধের চেতনা, মানবিকতা, অসাম্প্রদায়িক চেতনা, শুদ্ধাচার, নৈতিক মূল্যবোধ এবং দেশের সংস্কৃতি ও ঐতিহ্য সম্পর্কে সম্যক ধারণা পাবে।

শিখনফল:

- দেশপ্রেম ও মাতৃভাষার প্রতি মমত্ববোধ এবং ভাষা আন্দোলনের ইতিহাস জানা যাবে।
- সামাজিক মূল্যবোধ, মানবিকতা ও অসাম্প্রদায়িক জীবনবোধ জাগ্রত হবে।
- বাংলাদেশের মানুষ ও প্রকৃতি সম্পর্কে ধারণা লাভ করবে।
- নতুন শপথে আত্মপ্রত্যয়ী হয়ে এগিয়ে যাওয়ার ধারণা লাভে আনুপ্রানিত হবে।
- সকল মানুষের সম মর্যাদা অর্থাৎ নারী শিক্ষা ও নারীর ক্ষমতায়ন সম্পর্কে ধারণা লাভ করবে।
- ইতিহাস ও ঐতিহ্য সম্পর্কে ধারণা লাভ করতে পারবে।
- বাংলাদেশের গ্রামীণ জীবন চিত্র ও ঐতিহ্য সম্পর্কে ধারণা লাভ করবে।

বাংলা কবিতা	ক্লাস	নম্বর
১। বঙ্গভাষা – মাইকেল মধুসূদন দত্ত।	৩	২০
১.১ মাতৃভাষার প্রতি মমত্ববোধ জাগ্রত করা।		
১.২ সনেট সম্পর্কে ধারণা লাভ।		
১.৩ অমিত্রাক্ষর ছন্দের প্রয়োগ।		
২। সোনার তরী – রবীন্দ্রনাথ ঠাকুর।	২	
২.১ রূপক কবিতা সম্পর্কে ধারণা।		
২.২ মানব জীবনের গভীর সত্যকে উপলব্ধি করতে পারা।		
৩। সাম্যবাদী – কাজী নজরুল ইসলাম।	৩	
৩.১ বৈষম্যহীন সমাজ গঠনের ধারণা।		
৩.২ অসাম্প্রদায়িক চেতনার মাধ্যমে মানবতাবাদ প্রতিষ্ঠা।		
৩.৩ কথায়, আচরণে ও কাজে অসাম্প্রদায়িক মনোভাবের বহিঃপ্রকাশ ঘটানো।		
৪। আঠারো বছর বয়স – সুকান্ত ভট্টাচার্য।	২	
৪.১ মানব জীবনে বয়স উত্তরণ কালীন পর্যায়ে অন্যদের ওপর নির্ভরশীলতা পরিহার করে নিজের পায়ে দাঁড়ানোর শিক্ষা সম্পর্কে ধারণা।		
৪.২ নতুন শপথে আত্মপ্রত্যয়ী হয়ে এগিয়ে যাওয়ার ধারণা লাভে আনুপ্রানিত করা।		
৫। স্বাধীনতা, এই শব্দটি কিভাবে আমাদের হলো – নির্মলেন্দু গুণ।	২	
৫.১ স্বাধীনতার পটভূমি সম্পর্কে ধারণা।		
৫.২ ঐতিহাসিক ৭ই মার্চের ভাষণের তাৎপর্য ব্যাখ্যা।		

গদ্যাংশ (ছোট গল্প)		১২
৬। অপরিচিতা – রবীন্দ্রনাথ ঠাকুর।	৩	
৬.১ বাংলা ছোটগল্প সম্পর্কে ধারণা।		
৬.২ সমকালীন সমাজ জীবনের জটিল-কুটিল রূপ সম্পর্কে জানা।		
৬.৩ বাল্য বিবাহ ও পণপ্রথার কু-প্রভাব সম্পর্কে সচেতনতা।		
৭। একুশের গল্প – জহির রায়হান।	২	
৭.১ একুশে ফেব্রুয়ারির বাস্তব সত্য ঘটনাটি কীভাবে শিল্প সত্যে উত্তীর্ণ হলো তা জানা।		
৭.২ ভাষার জন্য আত্মত্যাগের কাহিনী জানা।		
৮। বিলাসী - শরৎচন্দ্র চট্টোপাধ্যায়।	২	
৮.১ সমাজের শ্রেণি বৈষম্য আলোচনা।		
৮.২ চরিত্রের মধ্যেও আত্মত্যাগের দৃষ্টান্ত।		
প্রবন্ধ		১০
৯। জাগো গো ভগিনী – বেগম রোকেয়া সাখাওয়াত হোসেন।	৩	
৯.১ নারী শিক্ষা সম্পর্কে সচেতনতা।		
৯.২ নারী শিক্ষা ও নারীর ক্ষমতায়ন সম্পর্কে জানা।		
১০। জাদুঘরে কেন যাব – আনিসুজ্জামান।	৩	
১০.১ বর্তমান এবং ভবিষ্যত প্রজন্মের জন্য সানন্দে জ্ঞান ও কৌতুহল সৃষ্টি।		
১০.২ মানব সভ্যতা ও সংস্কৃতির বৈচিত্র্যপূর্ণ নিদর্শনের মাধ্যমে মানব জাতির আল্পপরিচয় সম্পর্কে জ্ঞান লাভ।		
উপন্যাস		১০
১১। জননী সাহসিনী ১৯৭১ – আনিসুল হক।	৪	
১১.১ মুক্তিযুদ্ধ সম্পর্কে ধারণা।		
১১.২ মুক্তিযুদ্ধে নারীদের অংশগ্রহণ ও অবদান সম্পর্কে আলোচনা।		
১১.৩ বীরাজ্ঞানাদের জীবন চিত্র সম্পর্কে জানা।		
নাটক		০৮
১২। মানুষ – মুনীর চৌধুরী।	৩	
১২.১ একাঙ্কিকা নাটক সম্পর্কে ধারণা।		
১২.২ উপমহাদেশে সাম্প্রদায়িক দাঙ্গা সম্পর্কে ধারণা।		
১২.৩ সাম্প্রদায়িকতার উর্ধ্বে মানবতার বিজয়।		
মোটঃ	৩২	৬০

সহায়ক গ্রন্থ:

- ১। বঙ্গভাষা ‘চতুর্দশপদী কবিতাবলী’ - মাইকেলমধুসূদনদত্ত।
- ২। সোনারতরী ‘সোনারতরী’ - রবীন্দ্রনাথ ঠাকুর।
- ৩। সাম্যবাদী ‘সাম্যবাদী’ - কাজী নজরুল ইসলাম।
- ৪। আঠারো বছর বয়স –সুকান্ত ভট্টাচার্য, ছাড়পত্র, কাব্যগ্রন্থ।
- ৫। স্বাধীনতা, এই শব্দটি কিভাবে আমাদের হলো ‘চাষাভূষার কাব্য’ - নির্মলেন্দু গুণ।
- ৬। অপরিচিতা ‘গল্পগুচ্ছ’ - রবীন্দ্রনাথ ঠাকুর।
- ৭। একুশের গল্প ‘জহির রায়হানের রচনাবলী ২য় খন্ড’।
- ৮। বিলাসী ‘শরৎচন্দ্র চট্টোপাধ্যায়ের ১ম প্রকাশ ‘ভারতী’ পত্রিকা ১৩২৫ বঙ্গাব্দ ১৯১৮খ্রি.’ বৈশাখ সংখ্যা।
- ৯। জাগো গো ভগিনী - বেগম রোকেয়া সাখাওয়াত হোসেন - ‘রচনাবলী’।
- ১০। জাদুঘরে কেন যাব - আনিসুজ্জামান। স্মারক পুস্তিকা, সংকলিত।
- ১১। জননী সাহসিনী ১৯৭১ - আনিসুল হক রচিত।
- ১২। মানুষ (নাটক) - মুনীর চৌধুরী রচনা সমগ্র।
- ১৩। উচ্চ মাধ্যমিক বাংলা সংকলন - জাতীয় শিক্ষাক্রম ও পাঠ্যপুস্তক বোর্ড।
- ১৪। বাংলা ব্যাকরণ ও নির্মিতি - জাতীয় শিক্ষাক্রম ও পাঠ্যপুস্তক বোর্ড।

বিঃদ্রঃ বোর্ড প্রয়োজনে পাঠ্যসূচি ইউনিট ভিত্তিক নম্বরে কম বেশি করতে পারবে।

প্রণয়নেঃ

১. কৃষিবিদ মোঃ মোস্তফা কামাল, কারিকুলাম বিশেষজ্ঞ (কৃষি), বাংলাদেশ কারিগরি শিক্ষা বোর্ড, ঢাকা।
২. কনকেন্দু ভৌমিক, ইন্সট্রাক্টর (বাংলা), সিরাজগঞ্জ পলিটেকনিক ইন্সটিটিউট।
৩. শহিদা বিনতে বারী, ইন্সট্রাক্টর (বাংলা), রংপুর পলিটেকনিক ইন্সটিটিউট।
৪. ওমর খালেদ, ইন্সট্রাক্টর (বাংলা), দিনাজপুর টেক্সটাইল ইন্সটিটিউট।
৫. মোঃ আমিরুল ইসলাম, ইন্সট্রাক্টর (বাংলা), এমএস জোহা কৃষি কলেজ, আলমডাঙ্গা, চুয়াডাঙ্গা।
৬. হমা আফরোজ, জুনিয়র ইন্সট্রাক্টর (বাংলা), ঢাকা মহিলা পলিটেকনিক ইন্সটিটিউট।

Subject Code	Subject Name	Period per Week		Credit
25712	ENGLISH-I	T	P	C
		2	0	2

Rationale	The main aim of this syllabus is to provide an opportunity for the learners to use English for different situations. Every chapter of the syllabus is based on reading text and a range of tasks and activities, designed to enable the learners to practice the different skills, sometimes individually and sometimes in pairs or groups. This syllabus is allowing grammar to be used in a more meaningful role in learning language. Thus, the students develop their language skills by practicing language activities and not merely knowing the rules of the language.
Learning Outcomes	<p>After the completion of the course, learners will be able to:</p> <ul style="list-style-type: none"> • Develop Reading, Writing, Listening & Speaking Skills • Develop creative writing • Acquire grammatical accuracy • Communicate effectively

Unit Description:

Unit	Topics with Contents	Class (1 Period)	Final Marks
1. People or Institutions Making History	<p>THE UNFORGETTABLE HISTORY</p> <p>1.1. Read, know and share the history of war of independence</p> <p>1.2. Know about the historical speech of Bangabandhu</p> <p>1.3. Understand the meaning of confusing words</p> <p>Listening Practice (Only for contentious assessment)</p> <p>Follow the link (please play 2/3 minutes customized video):</p> <p>https://www.youtube.com/watch?v=K2guj3hhvNU</p>	1	15
2. Greatest Scientific Achievements	<p>SOME OF THE GREATEST SCIENTIFIC ACHIEVEMENTS OF THE LAST 50 YEARS</p> <p>2.1. Participate in conversations and debates</p> <p>2.2. Present information in a chart</p> <p>2.3. Infer meaning from the context</p> <p>2.4. surf the net</p> <p>https://www.youtu.be/7hU_iPFGTLI</p>	1	
3. Art and Music	<p>CRAFTS AT OUR TIME</p> <p>3.1. Describe the history of crafts and cultures</p> <p>3.2. Participate in discussion</p> <p>3.3. Narrate something in writing</p> <p>https://www.youtu.be/f90p_sdxW9o</p>	1	
4. Adolescence	<p>THE STORM AND STRESS AT ADOLESCENCE</p> <p>4.1.1. Identify the several sages of life</p> <p>4.1.2. Know the storm and stress of adolescence</p>	1	

	THE STORY OF SHILPI 4.2.1. Think about the adverse effects of child marriage 4.2.2. Know the activities of the NGOs	1	
5. Peace and Conflict	WHAT IS CONFLICT ? 5.1.1. Define conflict 5.1.2. Identify the reason of conflict 5.1.3. Follow lectures and take notes	1	
	THE PEACE MOVEMENT 5.2.1. Define peace 5.2.2. Ask for and give opinion regarding peace	1	
6. Tours and Travels	TRAVELLING TO A VILLAGE IN BANGLADESH 6.1. Infer meaning from the context 6.2. narrate something in writing	1	
7. Environment and Nature	WATER, WATER EVERYWHERE 7.1. Know the importance of water and resources of water 7.2. Know how the rivers are polluted 7.3. Ask for and give suggestions and opinions (listening, speaking and writing)	1	
8. Food Adulteration	EATING HABIT AND HAZARDS 8.1. Describe the eating hazards 8.2. Know the importance of eating habits 8.3. Kescribe people, places and their food habits	1	
9. Grammar	9.1 Parts of Speech 9.1.1. Utilize the words properly in the sentence	2	15
	9.2 Word Formation 9.2.1.1. Prefixes 9.2.2. Suffixes 9.2.3. Synonyms 9.2.4. Antonyms	1	
	9.3 Study of Verbs 9.3.1. Learn different kinds of verbs utilize the verbs properly in the sentence 9.3.2. Transitive and intransitive verbs 9.3.3. Infinitives, gerund, participles 9.3.4. Modals	2	
	9.4 The Sentence 9.4.1. Types of Sentence (affirmative, negative, interrogative, imperative, optative, exclamatory) 9.4.2. Components of sentences (subject, appositive, object, complement) 9.4.3. Modifiers (pre-modifiers and post-modifiers) 9.4.4. Questions (with WH words)	3	
	9.5 Use of Tenses 9.5.1. Learns all kinds of tenses 9.5.2. Use tense in different context	3	
	9.6 Adverbs and Adverbials	1	
10. Composition	Letters 1. Formal and Informal letters 2. Inquiry letter 3. Cancelation letter	3	30

	Paragraphs 1. Paragraph answering question 2. Paragraph with clues/without clues 3. Paragraph Comparing and contrasting	3	
	Greetings and Farewell	1	
	Describing situation	1	
	CV & Cover Letter	2	
	Total	32	60

Recommended Books:

SI	Book Name	Writer Name	Publisher Name & Edition
01	English For Today Classes XI – XII & Alim	QuaziMustainBillah FakrulAlam M Shahidullah ShamsadMortuza ZulfeqarHaider Goutam Roy	NATIONAL CURRICULUM AND TEXT BOOK BOARD, BANGLADESH

Website References:

SI	Web Link	Remarks
01	www.nctb.gov.bd	

Marks Distribution (100)	
Attendance	05
Class Test(Listening Test)	06
Quiz Test (Speaking)	04
Presentation and Assignment	05
Midterm	20
Final	60
Total	100

Assessment:**1. Test Items: Students will be evaluated on the basis of following criteria.**

Skills	Total Marks	Test Items	Notes
Listening	06	MCCQ, Gap filling, Matching	Test items must be newly prepared for each test by the question setters themselves on their own.
Speaking	04	Describing/narrating answering questions based on everyday familiar topics/events/situations such as family, school, home city/village, books, games and sports, movie/TV show, recent events and incidents etc. MCCQ Answering questions (open ended and close ended questions) Gap filling without clues Substitution tables Information transfer	Five to ten sentences used coherently with acceptable English with understandable pronunciation

2. Grammar Test Items:

- Identification of parts of speech
- Gap filling activities without clues
- Cloze test with/without clues
- Substitution tables
- Identify sentence
- Sentence analyzes
- Table matching

3. Composition Test Items:

- Writing process
- Completing an incomplete story
- Writing dialogue on a given situation
- Preparing an attractive poster on a given topic and describing it
- Preparing report on given context
- Describing a given graph/chart (descriptive, analyzing, analytic)
- Writing summary (given seen comprehension) with title

N.B: If BTEB desires “Number Distribution” of unit can changed.

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Subject code	Subject Name	Period per Week		Credit
25812	PHYSICAL EDUCATION AND LIFE SKILLS DEVELOPMENT	T 0	P 3	C 1

Rationale	To enhance body fitness by regular exercise that promotes strong muscles and bones. It will help students to develop as patriotic citizen by acquiring knowledge about liberation war and different national days. It will also increase the unity, patience, obedience, discipline and punctuality of students through regular physical exercise. Student will be able to acquaint with the common games, sports and make aware of first aid procedure and develop life skill.
Learning outcome	<p>After undergoing the subject, students will be able to:</p> <ul style="list-style-type: none"> ➤ Perform daily assemble & National Anthem in the right way. ➤ Apply different technique of exercise for developing body fitness. ➤ Identify the various kinds of physical exercise and practice properly. ➤ Select correct equipment of exercise and use them for particular physical Development.

Detailed Syllabus (Practical)

SL	Experiment Name & procedure	Class (3 Period)	Marks (continuous)
1.	<p>PERFORM ASSEMBLY</p> <p>1.1 Lifting National Flag according to Rules of measurement. 1.2 Perform Line, File and Squad Drill. 1.3 Perform assembly. 1.4 Recite national anthem. 1.5 Recite National anthem in music.</p>	1	2
2.	<p>PERFORM WARM-UP WITH PICTORIAL</p> <p>2.1 Perform Spot running (Slow, Medium & Fast), Neck rotation and Hand rotation of general Warm-up. 2.2 Perform Side twisting, Toe touching, Hip rotation, Ankle twisting, Sit up and Upper body bending (Front & Back) of general Warm-up. 2.3 Perform Legs raising one by one, Leg raising in slanting position, Knee bending and nose touching of Specific warm up. 2.4 Perform Heels rising, toes touching (standing and laying position), Hand stretch breathing (Tad asana, Horizontal, Vertical) of Specific warm up. 2.5 Perform Hand rising, Side twisting, Front and Back bending, Front curl of Mass physical Exercise. 2.6 Perform Straight arm curl two hand, Hands rising overhead and Push up of Mass physical Exercise.</p>	2	2

<p>3.</p>	<p>PERFORM YOGA</p> <p>3.1 Perform Dhyanasan, Shabasan, Padmasan, Gomukhasan, Sharbangan, Shashangan, Shirshan.</p> <p>3.2 Perform Shasthyasan, Halasan, Matshasan, PabanMuktasan, Ustrasan.</p> <p>3.3 Perform Prana and Pranyama, NadisuddhiPranayama, coolingpranayama(Sitali pranayama, Sitkaripramayama, Sadanta pranayama),Ujjayi Pranayama.</p>	<p>1</p>	<p>2</p>
<p>4.</p>	<p>DEVELOP MUSCLE</p> <p>4.1 Practice Dumbbell Front curl, Hand sidewise, stretches, Arms raising overhead.</p> <p>4.2 Practice Front press, Leg press and owing motion by using Barbell.</p> <p>4.3 Practice Straight way climbing, Leg rising climbing of Rope climbing.</p> <p>4.4 Practice Chinning the bar with front grip, Chinning the bar with wide back grip by using Horizontal bar.</p> <p>4.5 Practice Slow Medium and Fast running by using TradeMill.</p> <p>4.6 Practice Sit up by using Sit up bench.</p> <p>4.7 Perform Push-up with Push-up Bar.</p> <p>4.8 Perform Dips behind the back with Flat Bench or Iron Stolls.</p>	<p>1</p>	<p>2</p>
<p>5.</p>	<p>PERFORM GAMES AND SPORTS</p> <p>5.1 Perform Kabadi</p> <p>5.2 Perform Football</p> <p>5.3 Perform Cricket</p> <p>5.4 Perform Volleyball</p> <p>5.5 Perform Badminton</p> <p>5.6 Perform Athletics</p> <p>5.7 Perform Swimming.</p>	<p>1</p>	<p>3</p>
<p>6.</p>	<p>PRACTICE SPORTS SCIENCE</p> <p>6.1 Demonstrate Exercise physiology</p> <p>6.2 Identify Function of muscles.</p> <p>6.3 Define work, Energy and power.</p> <p>6.4 Mention Effect of exercise on Heart and Circulatory system.</p> <p>6.5 Mention the Motor components for physical fitness.</p> <p>6.6 Define Sports Biomechanics.</p> <p>6.7 Define Sports Psychology.</p> <p>6.8 Define Nutrition, Diet and Balanced diet.</p> <p>6.9 Define Test, Measurement and Evaluation.</p>	<p>1</p>	<p>2</p>
<p>7.</p>	<p>CELEBRATE LIBERATION WAR AND NATIONAL DAYS OF BANGLADESH</p> <p>7.1 Liberation war of Bangladesh(Short History).</p> <p>7.2 Celebrate Martyr’s Day (21 February).</p> <p>7.3 Celebrate Birth day of Bangabandhu (17 March).</p> <p>7.3 Celebrate Independence Day (26 March).</p> <p>7.4 Celebrate Bangali New Year Day(1st Boishakh).</p> <p>7.5 Celebrate National Mourning Day(15 August).</p> <p>7.6 Celebrate Victory Day(16 December).</p>	<p>1</p>	<p>2</p>

	7.7 Celebrate Martyred Intellectual Day(14 December). 7.8 Celebrate Others Historical Days selected by government.		
8.	APPLY FIRST AID 8.1 Identify tools of First Aid. 8.2 Apply First Aid. 8.3 Identify Responsibilities of a First Aider. 8.4 Identify Different types of Equipment of First Aid. 8.5 Apply Muscle Cramp-Ice Application (Remedy). 8.6 Apply Dislocation-Ice Application (Remedy).	2	2
9.	MAINTAIN HUMAN RELATION AND PERFORM SOCIAL WORK 9.1 Maintain Family Relation 9.2 Maintain Relation with neighbor. 9.3 Provide Humanitarian Service. 9.4 Provide Service for handicapped(Intelligent, Physical, Social 9.5 Provide Service for Orphan/Patient 9.6 Perform Tree plantation 9.7 Perform Blood Donation, Campus Cleaning, recycling, Gardening, Green Campus of Community Service 9.8 Perform Rover Scout 9.9 Perform Sanitation and Pure Drinking Water 9.10 Perform Social Culture.	3	4
10 .	CONTROL STRESS MANAGEMENT AND PRACTICE INTERVIEW TECHNIQUE 10.1 Identify Habit to be a man of Humor 10.2 Keep Brain Always Cool. 10.3 Practice Positive Thinking. 10.4 Identify Factors that Determine our Attitude 10.5 Identify benefits of a Positive Attitude. 10.6 Identify Steps to Building a Positive Attitude. 10.7 Prepare Mentally and physically to face an interview 10.8 Select Dress for interview 10.9 Practice Introduce myself to the interview 10.10 Practice Coping Interview.	3	4
	Total	16	25

Necessary Resources (Tools, Equipments, machinery)

SL	Items	Quantity
01	Football	
02	Volleyball	
03	Volleyball Net	
04	Badminton Racket	
05	Badminton Shuttle Cork	
06	Badminton Net	
07	Cricket Ball	
08	Cricket Bat	
09	Cricket Stamp	

10	Push-up Bar	
11	Adjustable Dumbbell	
12	Adjustable Barbell	
13	Thick Rope for Climbing with Hanging Set-up	
14	Horizontal Bar (Custom Made)	
15	Flat Bench/Tool With Foam Sit	
16	Sit-up Bench	

Recommended Books:

Sl	Book Name	Writer Name	Publisher Name & Edition
1.	Modern Yoga	KanyLal Shah	
2.	Rules of games and Sports	Kazi Abdul Alim	
3.	Yoga	Sobita Mallick	
4.	Iron Man	Nilmoni Dass	

Subject Code	Subject Name	Period per Week		Credit
25911	MATHEMATICS-I	T	P	C
		3	3	4

Rationale	Mathematics is the study of order, relation and pattern. Essential Mathematics provides students with the mathematical knowledge, skills and understanding to solve problems in real contexts, in a range of workplace, personal, further learning and community settings. Beside Mathematics help students to develop creativity and the ability to think, communicate, and solve problems. To resolve those Mathematics-I subject added in this curriculum. This subject will cover determinants and matrix, polynomial, quadratic equations, permutation and combination, measurement of angles, area of circle and equation of straight lines.
Learning Outcome (Theoretical)	<p>After undergoing the subject, students will be able to:</p> <ul style="list-style-type: none"> ➤ Solve determinants & matrix. ➤ Explain polynomial. ➤ Solve quadratic equations. ➤ Explain permutation and combination. ➤ Determine measurement of angles. ➤ Find area of circle. ➤ Find equation of straight lines.
Learning Outcome (Practical)	<p>After undergoing the subject, students will be able to:</p> <ul style="list-style-type: none"> ➤ Solve related to algebra problems. ➤ Solve related to trigonometry problems. ➤ Solve related to geometrical problems.

Detailed Syllabus (Theory)

Unit	Topics with Contents	Class (1 Period)	Final Marks
1.	<p>ALGEBRA (Determinants)</p> <p>1.1 Explain a third order determinant. 1.2 Define minor and co-factors. 1.3 State the properties of determinants. 1.4 Solve the problems of determinants. 1.5 Apply Cramer's rule to solve the linear equation.</p>	3	4
2.	<p>ALGEBRA (Matrix)</p> <p>2.1 Define matrix, null matrix, unit matrix, square matrix. column matrix, row matrix, inverse matrix, transpose matrix, adjoin matrix, rank of a matrix, singular matrix. 2.2 Explain equality, addition and multiplication of matrix. 2.3 Find the rank of a matrix (2×3,3×2,3×3 order Matrix). 2.4 Solve the problems of the following types: i) Solve the given set of linear equations with the help of matrix. ii) Find the transpose, adjoin and inverse matrix of a given matrix.</p>	3	5
3.	<p>ALGEBRA (Polynomial and Polynomials Equations)</p> <p>3.1 Define polynomials and polynomial equation.</p>	4	8

	3.2 Explain the roots and co-efficient of polynomial equations. 3.3 Find the relation between roots and co-efficient of the polynomial equations. 3.4 Determine the roots and their nature of quadratic polynomial equations. 3.5 Form the equation when the roots of the quadratic polynomial equations are given. 3.6 Find the condition of the common roots of quadratic polynomial equations. 3.7 Solve the problems related to the above.		
4.	ALGEBRA (Complex numbers) 4.1 Define complex numbers. 4.2 Perform algebraic operation (addition, subtraction, multiplication, division, square root) with complex number of the form $a + ib$. 4.3 Find the cube roots of unity. 4.4 Apply the properties of cube root of unity in solving problems.	2	4
5.	ALGEBRA (Permutation) 5.1 Explain permutation. 5.2 Find the number of permutations of n things taken r at a time when, i) Things are all different. ii) Things are not all different. 5.3 Solve problems related to permutation: i) Be arranged so that the vowels may never be separated.	3	5
6.	ALGEBRA (Combination) 6.1 Explain combination. 6.2 Find the number of combinations of n different things taken r at a time. 6.3 Explain n_{C_r} , n_{C_0} , n_{C_n} 6.4 Find the number of combinations of n things taken r at a time in which p particular things i) Always occur ii) never occur. 6.5 Establish i) $n_{C_r} = n_{C_{n-r}}$ ii) $n_{C_r} + n_{C_{r-1}} = n_{C_r} + 1_{C_r}$ 6.6 Solve problems related to the combination. Exp: From 10 men and 6 women a committee of 7 is to be formed. In how many ways can this be done so as to include at least two women in the committee.	3	5
7.	TRIGONOMETRY (Associated Angles): 7.1 Define associated angles. 7.2 Find the sign of trigonometrical function in different quadrants. 7.3 Calculate trigonometrical ratios of associated angle. 7.4 Solve the problems using above.	3	5
8.	TRIGONOMETRY (Trigonometrical Ratios) 8.1 Define compound angles. 8.2 Establish the following relation geometrically for acute angles. i) $\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$. ii) $\cos(A \pm B) = \cos A \cos B \pm \sin A \sin B$. 8.3 Deduce formula for $\tan(A \pm B)$, $\cot(A \pm B)$. 8.4 Apply the identities to work out the problems: i) Find the value of $\sin 75^\circ$, $\tan 75^\circ$. ii) Show that $\frac{\sin 75^\circ + \sin 15^\circ}{\sin 75^\circ - \sin 15^\circ} = \sqrt{3}$	4	5

	<p>iii) if $\alpha + \beta = \theta$, $\tan \alpha + \tan \beta = b$, $\cot \alpha + \cot \beta = a$, Show that $(a - b) = ab \cot \theta$.</p>		
9.	<p>TRIGONOMETRY (Transformation of formulae):</p> <p>9.1 Express sum or difference of two sines and cosines as a product and vice-versa</p> <p>9.2 Solve problems of the Following types:</p> <p>i) Show that, $\sin 55^\circ + \cos 55^\circ = \sqrt{2} \cos 10^\circ$</p> <p>ii) Prove that, $\cos 80^\circ \cos 60^\circ \cos 40^\circ \cos 20^\circ = \frac{1}{16}$</p>	4	4
10.	<p>TRIGONOMETRY (Multiple Angles)</p> <p>10.1 State the identities for $\sin 2A$, $\cos 2A$ and $\tan 2A$.</p> <p>10.2 Deduce formula for $\sin 3A$, $\cos 3A$ and $\tan 3A$.</p> <p>10.3 Solve the problems of the following types.</p> <p>i) express $\cos 5\theta$ in terms of $\cos \theta$.</p> <p>ii) if $\tan \alpha = 2 \tan \beta$, show that, $\tan(\alpha + \beta) = \frac{3 \sin 2\alpha}{1 + 3 \cos 2\alpha}$</p>	4	8
11.	<p>TRIGONOMETRY (Inverse circular function)</p> <p>11.1 Explain the term inverse circular function and principal value of a trigonometrical ratio.</p> <p>11.2 Deduce mathematically the fundamental relations of different circular functions.</p> <p>11.3 Convert a given inverse circular function in terms of other functions.</p> <p>11.4 Prove mathematically</p> <p>i) $\tan^{-1} x + \tan^{-1} y = \tan^{-1} \frac{x + y}{1 - xy}$.</p> <p>ii) $\tan^{-1} x + \tan^{-1} y + \tan^{-1} z = \tan^{-1} \frac{x + y + z - xyz}{1 - xy - yz - zx}$</p> <p>iii) $\sin^{-1} x + \sin^{-1} y = \sin^{-1} \left(x\sqrt{1 - y^2} + y\sqrt{1 - x^2} \right)$</p> <p>iv) $2 \tan^{-1} x = \sin^{-1} \frac{2x}{1 + x^2} = \cos^{-1} \frac{1 - x^2}{1 + x^2} = \tan^{-1} \frac{2x}{1 - x^2}$</p> <p>11.5 Solve problems of the following types.</p> <p>a) $2 \tan^{-1} \frac{1}{3} + \tan^{-1} \frac{1}{4} = \frac{\pi}{4}$</p> <p>b) $\cos \tan^{-1} \cot \sin^{-1} x = x$.</p>	3	8
12.	<p>TRIGONOMETRY (Trigonometrical Properties of triangles)</p> <p>12.1 Prove the followings identities:</p> <p>i) $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} = 2R$.</p> <p>ii) $a^2 = b^2 + c^2 - 2bc \cos A$</p> <p>iii) $a = b \cos C - c \cos B$.</p> <p>iv) $\Delta = \frac{1}{2} bc \sin A$.</p> <p>12.2 Establish the followings.</p> <p>a) $\tan \frac{A}{2} = \sqrt{\frac{(s-b)(s-c)}{s(s-a)}}$</p> <p>b) $\tan \frac{B-C}{2} = \frac{b-c}{b+c} \cot \frac{A}{2}$, c) $\Delta = \frac{abc}{4R}$</p> <p>12.3 Solve the problems of the following types:</p>	2	8

	<p>Prove $\cos(B - C) + \cos A = \frac{bc}{2R}$</p> <p>12.4 An object experiences two forces F_1 and F_2 of magnitude 9 and 13 Newtons with an angle 100° between their directions. Find the magnitude of the resultant R.</p>		
13.	<p>CO-ORDINATE GEOMETRY (Co-ordinates to find lengths and area)</p> <p>13.1 Explain the co-ordinates of a point.</p> <p>13.2 State different types of co-ordinates of a point.</p> <p>13.3 Find the distance between two points (x_1, y_1) and (x_2, y_2).</p> <p>13.4 Find the co-ordinates of a point which divides the straight line joining two points in certain ratio.</p> <p>13.5 Find the area of a triangle whose vertices are given.</p> <p>13.6 Solve problems related to co-ordinates of points and distance formula.</p>	2	5
14.	<p>GEOMETRY(The equation of straight lines in calculating various Parameter)</p> <p>14.1 Define straight line.</p> <p>14.2 Find the locus of a point.</p> <p>14.3 Solve problems for finding locus of a point under certain conditions.</p> <p>14.4 Describe the Equation $x=a$ and $y=b$ and slope of a straight line.</p> <p>14.5 Find the slope of a straight line passing through two point (x_1, y_1) and (x_2, y_2).</p> <p>14.6 Find the equation of straight lines:</p> <p>(i) Point slope form. (ii) Slope Intercept form.</p> <p>(iii) Two points form. (iv) Intercept form.</p> <p>(v) Perpendicular form.</p> <p>14.7 Find the point of intersection of two given straight lines.</p> <p>14.8 Find the angle between two given straight lines.</p> <p>14.9 Find the condition of parallelism and perpendicularity of two given straight lines.</p> <p>14.10 Find the distances of a point from a line.</p> <p>14.11 Solve problems related to above.</p>	4	8
15.	<p>CO-ORDINATE GEOMETRY (Circle)</p> <p>15.1 Define circle, center and radius.</p> <p>15.2 Find the equation of a circle in the form:</p> <p>(i) $x^2 + y^2 = a^2$</p> <p>(ii) $(x - h)^2 + (y - k)^2 = a^2$</p> <p>(iii) $x^2 + y^2 + 2gx + 2fy + c = 0$</p> <p>15.3 Find the equation of a circle described on the line joining (x_1, y_1) and (x_2, y_2).</p> <p>15.4 Define tangent and normal.</p> <p>15.5 Find the condition that a straight line may touch a circle.</p> <p>15.6 Find the equations of tangent and normal to a circle at any point.</p> <p>15.7 Solve the problems related to equations of circle, tangent and normal.</p>	4	8
	Total	48	90

Detailed Syllabus (Practical)

Sl.	Experiment name with procedure	Class (3 Period)	Marks (Continuous)
1	Solve problems related to Determinants. 1.1 Solve determinants Problems as per instruction. 1.2 Maintain the record of performed job.	2	3
2	Solve problems related to Matrix	2	2
3	Solve problems related to polynomials and polynomials equations.	2	3
4	Solve problems related to Complex numbers	1	2
5	Solve problems related to permutation	2	2
6	Solve problems related to Combination	2	3
7	Solve problems related to Associated Angles	1	2
8	Solve problems related to Trigonometrical Ratios of Compound angle.	1	2
9	Solve problems related to Multiple angles	2	3
10	Solve problems related to Inverse circular functions	1	3
	Total	16	25

Necessary Resources (Tools, equipment's and Machinery):

Sl	Item Name	Quantity
01	Scale	1 no
02	Geometric Box	1 no

Recommended Books:

Sl	Book Name	Writer Name	Publisher Name & Edition
5.	Companion to basic Maths	G. V. Kumbhojkar	Phadke Prakashan
6.	Co-ordinate Geometry & Vector Analysis	Rahman & Bhattacharjee	H.L. Bhattacharjee
7.	Higher Mathematics	Md. Nurul Islam	Akshar Patra Prakashani
8.	Mathematics for Polytechnic Students	S. P Deshpande	Pune Vidyarthi Graha Prakashan
9.	Mathematics for Polytechnic Students (Volume I)	H. K. Das	S.Chand Prakashan
10.	Engg. Maths Vol I & II	Shri Shantinakaran	S.Chand & Comp
11.	Higher Mathematics	Dr. B M Ekramul Haque	Akshar Patra Prakashani
12.	Differential & Integral Calculus	Md. Abu Yousuf	Mamun Brothers
13.	Higher Mathematics	Ashim Kumar Saha	Akshar Patra Prakashani
14.	Higher Mathematics	S.U Ahamed & M A Jabbar	Alpha Prakashani

Website References:

Sl	Web Link: www.YouTube.com	Remarks
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Subject Code	Subject Name	Period per Week		Credit
25912	PHYSICS-I	T	P	C
		3	3	4

Rationale	Physics is the basic science for all engineering students as well as diploma engineering students. To develop a foundation in scientific principle and processes for the understanding and application of various technology. It will help the students to study in technical subject of diploma engineering students and it is also pre-requisite of physics-2. This subject will cover quantities, Motion, mass, weight, force, pressure, wave, sound, velocity of sound, work, power and energy, elasticity of matter, behavior of fluids, and gas.
Learning Outcome (Theoretical)	<p>After undergoing the subject, students will be able to:</p> <ul style="list-style-type: none"> Describe Various types of quantities Enumerate Motion, mass, weight, force, pressure, wave, sound, velocity of sound, work, power and energy, elasticity of matter, behavior of fluids, and gas. Describe measurement of various quantities. Explain different techniques for improving the knowledge of matter.
Learning Outcome (Practical)	<p>After undergoing the subject, students will be able to:</p> <ul style="list-style-type: none"> Determine the diameter and area of cross section of wire. Measure thickness of glass plate. Verify the law of parallelogram of forces Determine the value of "g" and student will can draw $L - T^2$ graph. Calculate the Young's modulus of a steel wire. Determine the specific gravity of solid. Calculate the moment of inertia. Determine unknown frequency of tuning fork.

Detailed Syllabus (Theory)

Unit	Topics with Contents	Class (1 Period)	Final Marks
1.	<p>PHYSICAL WORLD AND MEASUREMENT</p> <p>1.1 Mention the Scope and excitement of physics. 1.2 Describe relation between Physics and other knowledge of technological world. 1.3 Describe Principle of measurement. 1.4 Relate units of Fundamental and derived quantities. 1.7 Describe the errors of measuring instrument. 1.8 Describe Slide calipers, Screw gauge and Spherometer.</p>	2	2
2.	<p>VECTOR QUANTITIES</p> <p>2.1 Describe vector and scalar quantities. 2.2 Prove the various representations of the vector quantities; and representation of a vector by unit vector. 2.3 Explain the resultant of two vectors in different directions.</p>	3	8

	<p>2.4 Resolve a vector into horizontal and vertical component.</p> <p>2.5 Explain the dot and cross product of two vectors.</p> <p>2.6 Define laws of triangle and parallelogram of Vector.</p> <p>2.7 Solve the problems related with vector.</p>		
3.	<p>MOTION AND EQUATIONS OF MOTION</p> <p>3.1 Define rest and motion.</p> <p>3.2 Mention the Classification of motion.</p> <p>3.3 Explain different motion.</p> <p>3.4 Deduce equations of motion.</p> <p>3.5 Explain the laws of falling bodies and mention the equation of motion of a body when it is projected vertically upwards or downwards.</p> <p>3.6 Solve the problems related with Motion.</p>	3	5
4.	<p>CIRCULAR MOTION</p> <p>4.1 Define circular motion and projectile motion.</p> <p>4.2 Deduce Equation of motion of a freely moving body thrown obliquely vertically upward or motion of a projectile.</p> <p>4.3 Define angular velocity and linear velocity with their units.</p> <p>4.4 Deduce the relation between angular velocity and linear velocity.</p> <p>4.5 Define centripetal and centrifugal force with examples.</p> <p>4.6 Prove that centrifugal force $F = \frac{mv^2}{r}$.</p> <p>4.7 Define moment of inertia, torque and angular momentum.</p> <p>4.8 Deduce the relation between moment of inertia, angular momentum and angular velocity.</p> <p>4.9 Deduce the relation between torque and angular acceleration.</p> <p>4.9 Explain the law of conservation of angular momentum.</p> <p>4.10 Solve the problems related with Circular Motion.</p>	5	8
5.	<p>FORCE AND FRICTION</p> <p>5.1 Define force, constant force, Variable force, conservative and non-conservative force.</p> <p>5.2 State Newton's law of motion and Prove that $F=ma$; from Newton's second law of motion.</p> <p>5.3 Describe different units of force, unit correlation and dimension of force.</p> <p>5.4 Derive the resultant of parallel forces.</p> <p>5.6 State and prove the principles of conservation of momentum.</p> <p>5.7 Describe friction.</p> <p>5.8 Define the co-efficient of static friction.</p> <p>5.9 Prove that the co-efficient of static friction is equal to the tangent of angle of repose.</p> <p>5.10 Mention the merits and demerits of friction.</p> <p>4.10 Solve the problems related with Force and Friction.</p>	3	8

6.	GRAVITY AND GRAVITATION 6.1 Explain the Kepler's law. 6.2 Define gravity and gravitation. 6.3 Explain Newton's law of gravitation. 6.4 Find out the relation between acceleration due to gravity (g) and gravitational constant (G). 6.5 State acceleration due to gravity 'g' with units and dimension. 6.6 Discuss the variation of 'g' at different places. 6.7 Define mass and weight. 6.8 Mention the units and dimension of mass and weight. 6.9 Describe escape velocity. 6.10 Solve the problems related with Force and Friction.	3	8
7.	SIMPLE HARMONIC MOTION 7.1 Describe periodic and simple harmonic motion (SHM). 7.2 Mention the characteristics of SHM. 7.3 Describe a simple pendulum. 7.4 Define effective length, amplitude, phase, complete oscillation, period of oscillation and frequency. 7.5 State the laws of simple pendulum. 7.6 Describe Motion of simple pendulum. 7.7 Deduce the differential equation of SHM. 7.8 Solve the problems related with SHM.	3	5
8.	WORK, POWER AND ENERGY 8.1 Define work, power, and energy. 8.2 State the units and dimensions of work, power and energy. 8.3 Prove the principle of conservation of energy for freely falling body. 8.4 Explain potential energy (PE) and kinetic energy (KE). 8.5 Derive work energy theorem. 8.6 Deduce the equation of potential and kinetic energy. 8.7 Recognize that the useful work can be found from: $\text{Efficiency} = \frac{\text{output work}}{\text{input work}} \times 100\%$ 8.8 Solve the problems related with work, power and energy.	5	8
9.	ELASTICITY 9.1 Define Elasticity and elastic limit. 9.2 Define perfectly elastic body and perfectly rigid body. 9.3 Explain stress and strain. 9.4 Explain the hook's law. 9.5 Describe various kinds of modulus of elasticity. 9.6 Define and explain Poisson's ratio. 9.7 Prove that the potential energy per unit volume is equal to $\frac{1}{2} \times \text{stress} \times \text{strain}$. 9.8 Solve the problems related with elasticity.	3	5
10.	SURFACE TENSION AND VISCOSITY 10.1 Describe cohesive and adhesive force. 10.2 Discuss the molecular theory of surface tension. 10.3 Define surface tension, surface energy and angle of contact. 10.4 Explain theory of capillarity. 10.5 Define viscosity and co-efficient of viscosity. 10.6 Mention necessity of viscosity. 10.7 Solve the problems related with surface tension and viscosity.	3	5

11.	PRESSURE AND CHARACTERISTICS OF PRESSURE 11.1 Discuss density and pressure as force per unit area and state that it is measured in N/m^2 or pascal. 11.2 Mention characteristics of liquid pressure. 11.3 Establish the pressure at a point in a fluid depend upon the density of the fluid, the depth in the fluid and acceleration due to gravity. 11.4 Solve the problems related with pressure.	2	3
12.	WAVE 12.1 Explain wave and wave motion. 12.2 Mention some definition of relating waves. 12.3 Describe the principle of super position. 12.4 Mention characteristics of progressive and stationary waves. 12.5 Derive the equation of progressive wave. 12.6 Define beats. 12.7 Describe the mathematical analysis of beats. 12.8 Solve the problems related with wave.	3	8
13.	SOUND AND VELOCITY OF SOUND 13.1 Explain sound and production of sound. 13.2 Describe that sound can be produced of different frequencies and that the human ear has an audible frequency range covering approximately 20Hz to 20KHz. 13.3 State the approximately frequency for Infrasonic sound and Ultrasonic sound. 13.4 Describe the practical uses of echo sounding devices. 13.5 Explain resonance, free vibration and forced vibration. 13.6 Derive the equation for velocity of sound, $v = \lambda f$. 13.7 Explain intensity and intensity level of sound. 13.8 Mention the effects of pressure, temperature, and humidity on the velocity of sound in air. 13.9 Solve the problems related with sound.	4	6
14.	IDEAL GAS AND KINETIC THEORY OF GASES 14.1 Define Ideal gas. 14.2 Describe the laws of gas. 14.3 Define absolute zero temperature 14.4 Define STP or NTP. 14.5 Describe fundamental postulates of gas molecules. 14.5 Explain the kinetic theory of gas molecules. 14.6 Prove that the ideal gas equation is $PV = nRT$ 14.7 Solve the problems related with theory of gases.	3	8
15.	HUMIDITY 15.1 Explain Humidity, Absolute Humidity, Relative Humidity and Dew point. 15.2 Derive relation between vapor pressure and air pressure. 15.3 Determine humidity by wet and dry Bulb Hygrometer. 15.4 Explain few phenomena related to hygrometry. 15.5 Solve the problems related with humidity.	3	3
	Total	48	90

Detailed Syllabus (Practical)

Unit	Topics with Contents	Class (3 Period)	Marks (Continuous)
1.	Determine accurate diameter of an object using slide calipers. 1.1 Collect sample of an object and slide calipers. 1.2 Check and set the slide calipers. 1.3 Measure small length of any object. 1.4 Measure diameter of any small cylinder. 1.5 Calculate the volume of any spherical body. 1.6 Maintain the record of performed Job.	1	3
2.	Measure the area of cross section of a wire by using screw gauge. 2.1 Collect sample of a wire and screw gauge. 2.2 Check and set screw gauge. 2.3 Measure diameter of any narrow wire. 2.4 Calculate cross section of any object. 2.5 Maintain the record of performed Job.	1	2
3.	Determine the thickness of a glass plate by Spherometer. 3.1 Collect sample of a glass plate and spherometer. 3.2 Check and set screw gauge. 3.3 Level the spherometer by adjusting screw. 3.3 Measure narrow thickness of any object. 3.4 Calculate radius of curvature of lens. 3.5 Maintain the record of performed Job.	1	3
4.	Verify the law of parallelogram of forces by a force board. 4.1 Collect a force board. 4.2 Check and set a force board. 4.3 Observe and record the direction of resultant force. 4.4 Maintain the record of performed Job.	1	2
5.	Determine the co-efficient of static friction. 5.1 Collect necessary tools and materials. 5.2 Check and set the equipment. 5.3 Select two experimental object. 5.5 Set the object and weight each object by using horizontal table 5.6 Prevent excessive sliding of any things on a sloped surface. 5.7 Calculate the static friction by using formula 5.8 Maintain the record of performed Job.	1	3
6.	Determine the value of "g" by using a simple pendulum and draw $L - T^2$ graph. 6.1 Collect necessary tools and materials. 6.2 Check and set a simple pendulum. 6.3 Measure the acceleration of gravity different places. 6.4 Measure the weight of any bodies by knowing the value of "g". 6.5 Calculate the Time period of any oscillated body by knowing the value of "g". 6.6 Maintain the record of performed Job.	3	2
7.	Determine the Young's modulus of a steel wire by Searle's apparatus or by using Vernier method. 7.1 Collect necessary tools and materials. 7.2 Check and set Searle's apparatus using Vernier method. 7.3 Measure length of a steel wire.	2	3

	7.4 Set the test specimen of a steel wire into the Searle's apparatus. 7.5 Verify elastic properties of any body. 7.6 Maintain the record of performed Job.		
8.	Determine the specific gravity of solid heavier than insoluble in water by Hydrostatic balance. 8.1 Collect necessary tools and materials. 8.2 Check and set Hydrostatic balance. 8.3 Set the test specimen in hydrostatic balance. 8.4 Measure the weight of a solid particle. 8.5 Measure the weight of a solid particle keeping under water. 8.6 Measure the temperature of water by thermometer. 8.7 Calculate specific gravity of solid. 8.8 Calculate specific gravity of solid repeatedly and calculate average value. 8.9 Check and justify the accuracy various type of solid by knowing value of specific gravity. 8.10 Maintain the record of performed Job.	2	2
9.	Determine the specific gravity of liquid by specific gravity bottle. 9.1 Collect necessary tools and materials. 9.2 Check and set specific gravity bottle. 9.3 Measure the weight of empty bottle. 9.4 Measure the weight of bottle with water. 9.5 Measure the weight of bottle with specimen liquid as same amount of water 9.6 Repeat the task of 8.6 three time. 9.7 Record the data in the table of above task. 9.8 Calculate the specific gravity of liquid 9.9 Maintain the record of performed Job.	2	3
10.	Determine Velocity of sound resonance method. Collect necessary tools and materials. 10.1 Check and set resonance air column. 10.2 Fill up pipe of resonance pipe of column by water. 10.3 Strike the resonance device on a pad. 10.4 Measure the wave length of sound. 10.5 Repeat the task of 9.5 three time. 10.6 Record the data in the table of above task. 10.7 Calculate the frequency and velocity of sound 10.8 Maintain the record of performed Job.	2	2
	Total	16	25

Necessary Resources (Tools, equipment's):

Sl	Item Name	Quantity
1	Slide calipers	15
2	Screw gauge	15
3	Spherometer	15
4	Simple pendulum	10
5	Searle, s apparatus	5
6	Hydrostatic balance	5
7	Fly wheel	5
8	Tuning fork	10

Recommended Books:

SI	Book Name	Writer Name	Publisher Name & Edition
1.	Higher secondary physics (First part)	Dr. ShahjahanTapan Ishak Nurunnabi Prof. Golam Hossain Pramanik	
2.	A Text Book of properties of matter	N Subrahmanyam and Brijlal	
3.	A Text Book of Sound	N Subrahmanyam and Brijlal	

Website References:

SI	Web Link:	Remarks
1	www.Youtube.com	Search here

Subject Code	Subject Name	Period per Week		Credit
25914	CHEMISTRY-I	T	P	C
		2	3	3

Rationale	Chemistry is the branch of science that deals with study of matter, its composition, physical and chemical properties and applications. It is important for diploma engineers to have knowledge of chemistry as those may face problems in fields as diverse as design and development of new materials, quality control and environmental engineering that are basically chemistry oriented in nature. Chemistry is the backbone in designing and understanding the nature of various engineering materials. Many advances in engineering and technology either produce a chemical demand. The subject covers atomic structure, chemical reaction, ionic equilibrium, organic and vocational chemistry to understanding and application. The emphasis will be more on teaching practical aspect rather than theory.
Learning Outcome (Theoretical)	<p>After undergoing the subject, students will be able to:</p> <ul style="list-style-type: none"> ➤ Describe Atomic Structure. ➤ Describe Symbol, valency and radical. ➤ Describe Properties of gas and its law. ➤ Different types of bonds. ➤ Define Acid, base and salt. ➤ Describe Buffer solution, pH and its application. ➤ State Different types of reaction and catalyst. ➤ Calculate oxidation and reduction number. ➤ Describe Hardness of water and its removing process. ➤ Illustrate Electrolysis process.
Learning Outcome (Practical)	<p>After undergoing the subject, students will be able to perform:</p> <ul style="list-style-type: none"> ➤ Use laboratory equipment's and safety measure. ➤ Perform Preparation of various strength of solution. ➤ Calculate the strength of unknown solution. ➤ Identify Nature of different type of solution. ➤ Perform Qualitative analysis of radicals and salt. ➤ Perform Preparation of vinegar and sanitizer.

Detailed Syllabus (Theory)

Unit	Topics with Contents	Class (1 Period)	Final Marks
1.	<p>ATOMIC STRUCTURE</p> <p>1.1 Define Element, atoms and molecules.</p> <p>1.2 Define molecular mass, atomic number, mass number, mole and Aveogadro's number.</p> <p>1.3 Distinguish between atom and molecule.</p> <p>1.4 Describe Fundamental particle of atom.</p> <p>1.5 Define isotope, isobar and isotone.</p> <p>1.6 Define Orbit and Orbital.</p> <p>1.7 Explain Quantum number.</p>	6	7

	1.8 Describe Electronic configuration based on Aufbau principle, Hund's rule and Pauli's exclusion principle.		
2.	SYMBOL, VALENCY AND FORMULA 2.1 Define Symbol, Valency and formula. 2.2 Discuss the variations of valency. 2.3 Describe active and latent valency. 2.4 Describe Radicals.	3	6
3.	GAS 3.1 Define gas and vapor. 3.2 Mention the Characteristic of gas. 3.3 Distinguish between gas and vapor. 3.4 Define STP, NTP and Absolute temperature. 3.5 Mention the Boyle's, Charles's and Avogadro's law. 3.6 Establish the ideal gas equation ($PV=nRT$)	3	6
4.	CHEMICAL BOND 4.1 Define Chemical Bond. 4.2 Define Octet rule. 4.3 Explain Ionic bond, Covalent bond and Coordinate covalent bond. 4.4 Mention the Characteristic of ionic and covalent compound. 4.5 Differentiate between ionic and covalent compounds.	3	6
5.	ACID, BASE AND SALT 5.1 State Modern concept of Acid and Base. 5.2 List the properties of acid and base. 5.3 Classify Salt 5.4 Explain Basicity of an acid and acidity of a base.	3	6
6.	IONIC EQUILIBRIUM 6.1 Explain pH and pH scale. 6.2 Define Normality, Molarity and Molality. 6.3 Define Primary and Secondary Standard Substances. 6.4 Define Standard Solution, Titration and Indicator. 6.5 Define Buffer Solution and Its Mechanism. 6.6 Describe Importance of pH in Agriculture and Chemical Industries.	3	6
7.	CHEMICAL REACTION 7.1 Define Exothermic and endothermic reaction. 7.2 Define Chemical Reaction 7.3 Classify Chemical Reaction. 7.3 Describe Catalyst and Catalysis. 7.5 Mention the uses of Catalyst in Industries.	3	6
8.	OXIDATION AND REDUCTION 8.1 Describe Modern concept of Oxidation and Reduction. 8.2 Define Oxidizing agent and Reducing agent. 8.3 Describe Simultaneous process of Oxidation and Reduction. 8.4 Explain the Oxidation number / state. 8.5 Distinguish Between Oxidation number and Valency.	3	6
9.	WATER 9.1 Define Hard and Soft water. 9.2 Define Hardness of water. 9.2 Describe permutit process to removal the hardness of water. 9.3 Mention the Advantage and disadvantage of Soft and Hard water. 9.4 Describe Reverse Osmosis process.	3	6

10.	ELECTRO-CHEMISTRY 10.1 Define Electrolyte, Electrolysis and Electrode. 10.2 State the Mechanism of Electrolysis process. 10.3 Mention the Process of Chrome Electro-plating. 10.4 Define Galvanizing. 10.5 Mention the importance of Galvanizing.	3	5
	Total	32	60

Detailed Syllabus (Practical)

Sl.	Experiment name with procedure	Class (3 Period)	Marks (Continuous)
1	Safe Use of Laboratory and Familiar with instrument 1.1 Follow Laboratory Rules and OSH. 1.2 Wear Apron, Safety Glass, Mask and Gloves. 1.3 Use of Conical flask, Wash bottle, Burette, Pipette. 1.3 Use Flammable substance according to instruction. 1.4 Importance of minimum use of chemical. 1.5 Use of Fast aid box 1.6 Follow DO's or Don't in laboratory	2	2
2	Perform Preparation of decimolar (0.1M) Na ₂ CO ₃ Solution	1	2
3	Determine the strength of H ₂ SO ₄ Solution by decimolar (0.1M)	1	2
4	Perform Preparation of decimolar (0.1M) NaOH Solution.	1	2
5	Determine the strength of Hydrochloric acid (HCl) Solution by decimolar (0.1M) NaOH Solution	1	2
6	Measure the pH value of unknown solution using pH meter and paper.	1	3
7	Identify Radicals : Cu ²⁺ , Al ³⁺ , Fe ²⁺ , Fe ³⁺ , Ca ²⁺ , Zn ²⁺ , NO ₃ ⁻ , Cl ⁻ , SO ₄ ²⁻ , CO ₃ ²⁻	3	4
8	Identify salt: (Cu(NO ₃) ₂ , AlCl ₃ , FeSO ₄ , FeCl ₃ , CaCO ₃ , ZnCl ₂)	4	4
9	Perform Preparation of vinegar from Acetic acid	1	2
10	Perform Preparation of Sanitizer using Isopropyl Alcohol	1	2
	Total	16	25

Necessary Resources (Apparatus and equipment's):

SI	Item Name	Quantity
01	Test tube, Test tube holder, Test tube Stand, Test tube brush, Bunsen burner , Cork borer, Spatula, Dropper, Clamp	
02	Beaker, Conical flask, Round bottomed flask, Volumetric flask, Distillation flask , Pneumatic trough	
03	Porcelain basin, Crucible, Mortar and pestle	
04	Thistle funnel, Buchner funnel, Common funnel, Dropping funnel	
05	Woulfs bottle, Wash bottle, Reagent bottle,	
06	Retort, Gas jar, Gas chamber, War gauge, Watch glass, Capillary tube, Platinum wire, Copper wire,	
07	Tripod stand, Burette stand, Ring stand, Crucible tong, Gas generator/ Gas Cylinder	
08	Burette, Pipette, Measuring cylinder, Glass rod	
09	Digital balance, Analytical balance, Weight box, pH meter, pH paper, Litmus paper,	

	Filter paper, Kipp's apparatus	
10	Safety glass, Gloves, Apron, Mask, Fire estighguser, First aid box	

Required Chemicals:

SI	Item Name (Consumables Materials)	Quantity
01	Distilled water, Petrol, Grease etc	
02	Different type of acid : HCl, H ₂ SO ₄ , HNO ₃ , H ₃ PO ₄ , CH ₃ COOH etc.	
03	Different type of base such as NaOH, KOH, Ca(OH) ₂ , Al(OH) ₃ , NH ₄ OH, etc	
04	Different type of salt : [Cu(NO ₃) ₂ , AlCl ₃ , FeSO ₄ , FeCl ₃ , CaCO ₃ , ZnCl ₂ , NH ₄ Cl etc]	
05	Different type of indicator	
06	Different type of reagent such as Potassium Ferro cyanide, Potassium iodide , Nessler's solution, Potassium pyroantimonate solution, Ammonium oxalate solution, etc	

Recommended Books:

SI	Book Name	Writer Name	Publisher Name & Edition
01	Higher secondary chemistry	Dr. Sarozkantishnghazari	Hasan book house
02	Higher secondary chemistry	Mahbubhasnlinkon	Akharpatro
03	Engineering chemistry	Uppal	Khanna publishers
04	Chemistry practical	Dr. Sarozkantishnghazari	Hasan book house

Website References:

SI	Web Link	Remarks
01	www.researchgate.net	

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N.B: IF REQUIRED BTEB CAN CHANGE PER UNIT OF MARKS.

SUBJECT CODE	SUBJECT NAME	PERIOD/WEEK		CREDIT
25915	BIOLOGY-I	T	P	C
		2	3	3

Rationale	<p>Biology is the basic life science. It includes plant, animal, and nature. Main objectives of biology education are gaining theoretical and practical knowledge from life. This blended syllabus emphasized on the applied side of that knowledge. Through studying it, students can solve various realistic life related problems by applying latest technologies. It also plays positive role to ensure and upgrade their socio economic condition. Side by side, it creates better scope to enroll them in higher education. Through lab work, their knowledge must be practical based. So that, by studying this syllabus students would be more skilled, logical, talented therefore self-dependent, which leads them to be entrepreneur. Thus, they will be more capable to enter in upcoming forth-global industrial revolution.</p>
Learning Outcome (Theoretical)	<p>After undergoing the subject, students will be able to</p> <ol style="list-style-type: none"> 1. Describe the basic concept of biology and differentiate between non-living and living, plant-animal. (Ch:1) 2. Detail branches and classification of plant with examples. (Ch:02) 3. Narrate various types of fruits with Agricultural importance. (Ch:03) 4. Define and describe plant and animal cell structure with comparison. (Ch:4) 5. Mention types of cell division with characteristics. (Ch:5) 6. Discuss root, stem and leaf in detail. (Ch:6) 7. Define and describe different types of flower and inflorescence with function. (Ch:7) 8. Illustrate and detail fruit and seed. (Ch:8) 9. Explain the various physiological activities of plant. (Ch:09) 10. Explain the various biological process of plant. (Ch:10)
Learning Outcome (Practical)	<p>After undergoing the subject, students will be able to</p> <ol style="list-style-type: none"> 1. Observe and operate simple and compound microscope.. (Practical: 1) 2. Observe, identify and illustrate plant and animal cell. (Practical: 2) 3. Identify and draw various stages of cell division with its characters. (Practical: 3) 4. Observe, identify and illustrate the monocot and dicot root. (Practical: 4). 5. Observe, identify and illustrate the various types of root, stem and leaf. (Practical: 5). 6. Observe, identify and illustrate the different parts of flower and inflorescence. (Practical: 6). 7. Observe, identify and illustrate the various types of fruits. (Practical: 7). 8. Observe, identify and illustrate the family of gramineae. (Practical: 8). 9. Observe, identify and illustrate the family of Liliaceae. (Practical: 8). 10. Observe, identify and illustrate the family of Leguminosae (Practical: 8). 11. Observe, identify and illustrate the family of Cucurbitaceae. (Practical : 8) 12. Observe, identify and illustrate the family of Cruciferry. (Practical : 8) 13. Observe, identify and illustrate the family of Malvacea, (Practical : 8) 14. Observe, identify and illustrate the epigeal and hypogeal germination. (Practical : 9) 15. Observe, identify and illustrate the oxygen production through photosynthesis (Practical : 10)

DETAILED SYLLABUS (THEORY)

Unit	Topics with Contents	Class (1 Period)	Final Marks
1.	Basic concept of Biology 1.1 Define Biology. 1.2 Define Botany and Zoology. 1.3 Describe different Branches of Biology. 1.4 State the origin and history of Biology. 1.5 Mention the Importance of Biology. 1.6 Differentiate between living and non-living things. 1.7 Distinguished between plants and animals.	1	6
2	Classification of Plant 2.1 Define plant 2.2 Mention the different branches of Botany. 2.3 Classify Plants. 2.4 Define Classification. 2.5 Narrate different types of plant classifications. 2.6 Mention the Units of classification. 2.7 Describe the Theophrastus and Bentham-Hooker's Classification. 2.8 Mention the characteristics of monocotyledons and dicotyledones. 2.9 Differentiate between monocotyledons and dicotyledones. 2.10 Describe different Types of autotrophic and heterotrophic plants.	2	6
3	Crop plants and Acquaint of Various Plant Families 3.1 Define Crop plant 3.2 State the different types of crop plants 3.3 Mention the economic importance of agricultural plant. 3.4 Describe the economic importance of Graminaeae /Poaceae, Leguminosae, Liliaceae, Leguminosae/Fabaceae, Cruciferry, Solanaceae and Malvacea, Liliaceae and Cucurbitaceae.	4	6
4	Plant and Animal Cell 4.1 Define Cell, Plant cell, Eukaryotic & Prokaryotic cell. 4.2 Describe the structure of a typical plant and animal cell. 4.3 Describe different plant and animal cell organelles. 4.4 Differentiate between typical plant cell and animal cell. 4.5 Define chromosome. 4.6 Describe physical structure. 4.7 Mention the function of chromosomes.	4	6
5	Cell Division 5.1 Define cell division. 5.2 Describe different kinds of cell divisions. 5.3 Narrate Mitosis and Meiosis cell division. 5.4 Describe different steps of Mitosis and Meiosis Cell division. 5.5 State Importance of Mitosis and Meiosis Cell division.	3	6

6	Plant Root Srem and Leaf 6.1 Define Roots. 6.2. Describe regions and function of a typical plant roots. 6.3. Discuss Tap/radicle root and Fibrous/Adventitious root. 6.4 Describe various types and function of Modified Roots. 6.5 Define Stem and Modified Stem. 6.6 State different parts of Stem and Modified Stem. 6.7 Mention the function of Stem and Modified Stem. 6.8 Define Leaf. 6.9 Describe different parts of leaf. 6.10 Mention different types, Characteristics and function of Leaves. 6.11 State Venation and functions of Venation.	4	6
7	The Flower and the Inflorescence 7.1. Define Flower; 7.2 Mention different parts of a typical Flower. 7.2. Describe types of Flowers. 7.3. Discuss the functions of different parts of a typical Flower. 7.4. Define Inflorescence. 7.5 Describe types of inflorescence. 7.5 Mention the function of flower.	3	6
8	Fruits and seed dispersal 8.1 Define fruit. 8.2 Describe types of Fruit. 8.3 Define Seed. 8.4 Describe different parts of Seed. 8.5 Mention the Functions of seed. 8.6 Define seed germination. 8.7 State the types of seed germination. 8.8 Describe external and internal factors of seed germination. 8.9 Describe seed dormancy and viability.	3	6
9	Plant Water Relationship 9.1 Narrate the Importance of water in plants. 9.2 Define osmosis. 9.3 Describe the importance of osmosis. 9.4 State diffusion. 9.5 Differentiate between diffusion and osmosis. 9.6 Describe absorption of water and mineral salts. 9.7 Define transpiration. 9.8 Describe types of transpiration. 9.9 Describe importance of transpiration.	3	6
10.	Plant Biological Processes 10.1 Define turgidity and plasmolysis. 10.2 Discuss the process of osmosis. 10.3 Define photosynthesis. 10.4 Describe factors, process and importance of photosynthesis. 10.5 Define respiration. 10.6 Mention the factors, process and importance of respiration. 10.5 Differentiate between photosynthesis and respiration.	3	6
	Total	32	60

DETAILED SYLLABUS (PRACTICAL)

Sl.	Experiment name with procedure	Class (3 Period)	Marks (Continuous)
1	Observe Microscope. 1.1 Collect Microscope. 1.2 Observe different parts of simple and compound microscope. 1.3 Observe the functions of various parts. 1.4 Draw and label the diagram of a simple & compound microscope. 1.5 Maintain the record of Performed task.	1	2
2	Observe different plant cells. 2.1 Identify plant and animal cell under a microscope. 2.2 Draw and label the diagram of different parts. 2.3 Maintain the record of Performed task.	1	2
3	Observe Mitosis and Meiosis Cell division 3.1 Observe Mitosis and Meiosis cell division under a microscope. Draw and label the diagram its parts.	1	2
4	Observe monocot and dicot root. Observe the transverse section of monocot and dicot root under a microscope. Draw and label the diagram its parts.	1	3
5	Observe root, stem and leaves. Observe different types of root, stem and leaves. Draw, and label the diagram its parts.	2	3
6	Observe different type of flower and inflorescence Observe different types of flower and inflorescence. Draw, and label the diagram.	1	2
7	Observe different types of fruits. Observe and identify varieties of fruits. Draw and label the parts of its.	2	2
8	Observe different type of family (Graminaeae /Poaceae, Leguminosae, Liliaceae, Leguminosae/Fabaceae, Cruciferry, and Malvacea, Liliaceae and Cucurbitaceae.) Identify the sample plant. Draw and label its parts. Note down the General Features of family.	2	3
9	Observe Epigeal and Hypogeal germination Experiment the Epigeal and Hypogeal germination Draw and label its.	1	3
10	Observe Photosynthesis. Observation : gas bubbles in a test-tube (Presence of oxygen)	1	3
	Total	16	25

N.B: IF REQUIRED BTEB CAN CHANGE PER UNIT OF MARKS.

NECESSARY RESOURCES (TOOLS, EQUIPMENT'S AND MACHINERY):

SI	Item Name	Quantity
01	Simple and compound microscope, Dropper, Test tube, funnel ,beaker, conical flask, sprit lamp fire box cylinder, pipette , measuring cylinder, cover slip, filter paper, watch glass, Petridis, dissecting box, slides, models, posters, blotting paper, table lamp, wax tray, hand gloves, apron.	

Required Chemicals:

SI	Item Name (Consumables Materials)	Quantity
01	Formalin, chloroform, glycerin, safranin, Canada balsam, alcohol, acitocarmin.	

RECOMMENDED BOOKS:

SI	Book Name	Writer Name	Publisher Name & Edition
01	Biology-1	Dr. Mohammad Abul Hassan	Hasan book house, Dhaka.
02	Biology-1	Gazi Azmol	Gazi publishers.

WEBSITE REFERENCES:

SI	Web Link	Remarks
01	www.youtube.com	Search here with topics
02	www.google.com	
03	www.bteb.bd.com	

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