



REPUBLIC OF THE PHILIPPINES  
PROFESSIONAL REGULATION COMMISSION  
MANILA



PROFESSIONAL REGULATORY BOARD OF SANITARY ENGINEERING  
RESOLUTION NO. 02  
Series of 2022

ADOPTION, ISSUANCE, AND PROMULGATION OF THE ENHANCED SYLLABI  
AND TABLES OF SPECIFICATIONS FOR THE SUBJECTS IN THE  
SANITARY ENGINEERS LICENSURE EXAMINATION

**WHEREAS**, Section 9(h) of Republic Act (R.A.) No. 8981 or the “PRC Modernization Act of 2000” empowers the Professional Regulatory Boards to prepare, adopt, and issue the syllabi or tables of specifications (TOS) of the subjects for examinations, in consultation with the academe; determine and prepare the questions for the licensure examinations which shall strictly be within the scope of the syllabus or TOS of the subject for examination;

**WHEREAS**, Section 4 of R.A. No. 1364 or the “Sanitary Engineering Law” vests to the Professional Regulatory Board of Sanitary Engineering (Board) the authority to discharge such other powers and duties as may affect ethical and technological standards of the Sanitary Engineering profession in the Philippines;

**WHEREAS**, Section 13 of R.A. No. 1364 enumerates the subjects in the Sanitary Engineers Licensure Examination (SELE);

**WHEREAS**, the Commission on Higher Education (CHED) issued CHED Memorandum Order (CMO) No. 35 (s. 2009) on the “Policies and Standards (PS) for the Degree of Bachelor of Science in Sanitary Engineering (BSSE)”;

**WHEREAS**, on 10 June 2009, the Board issued Resolution No. 4 (s. 2009) adopting and promulgating the Tables of Specifications (TOS) of the subjects in the SELE;

**WHEREAS**, in accordance with R.A. No. 7722, otherwise known as the “Higher Education Act of 1994,” in pursuance of an outcomes-based quality assurance system as advocated under CMO No. 46 (s. 2012)<sup>1</sup> and as addendum to CMO No. 37 (s. 2012)<sup>2</sup> and by virtue of CHED *en banc* Resolution No. 788 (s. 2017) dated October 24, 2017, the revised Policies, Standards and Guidelines (PSG) for the Bachelor of Science in Sanitary Engineering (BSSE) Program have been adopted and promulgated effective Academic Year 2018-2019 via CMO No. 98 (s. 2017)<sup>3</sup>;

**WHEREAS**, there is a need to develop an enhanced syllabi and TOS for the SELE subjects in order to align the same with the latest PSG for the BSSE Program under CMO No. 98 (s. 2017). The proposed Enhanced Syllabi and TOS had undergone online consultations with various educational institutions, universities and colleges and been presented to the accredited professional organization during its 23 June 2022 Midyear National Convention;

<sup>1</sup> “Policy-Standard to Enhance Quality Assurance (QA) in Philippine Higher Education through an Outcomes-Based and Typology-Based Quality Assurance”

<sup>2</sup> “Policies, Standards and Guidelines in the Establishment of an Outcomes-Based Education (OBE) System in Higher Education Institutions offering Engineering Programs”

<sup>3</sup> “Revised Policies, Standards and Guidelines for the Bachelor of Science in Sanitary Engineering (BSSE) Program Effective Academic Year (AY) 2018-2019”

**WHEREAS**, Professional Regulatory Board Test Consultant, Dr. Elizabeth R. Ventura, PhD, has recommended for submission and approval the enhanced syllabi and TOS as prepared by the Board after the stakeholders' consultations.

**WHEREFORE**, the Board **RESOLVES**, as it is hereby **RESOLVED**, to issue the enhanced Syllabi and Tables of Specifications for the subjects of the Sanitary Engineers Licensure Examination (Annex A) which shall be applied beginning August 2022 onwards.

**RESOLVED FURTHER**, that BSSE graduates before the implementation of the 2017 CHED Memorandum Order No. 35 (s. 2009) who are to take/retake the Sanitary Engineers Licensure Examination are encouraged to take refresher course/s to fill in the gap between the old and new curricula.

Board Resolution No. 4 (s. 2009) and all other issuances inconsistent herewith are hereby repealed.

This Resolution and its Annexes shall take effect immediately following its publication in the Official Gazette or in any newspaper of general circulation.

Let a copy hereof be furnished the UP Law Center.

Done in the City of Manila this 15<sup>th</sup> of August, 2022.

  
**CORAZON DLR. ROMERO**  
Chairperson

  
**ANTHONY JEROME M. LARA**  
Member

  
**GRACIANO CALAYAN JR**  
Member

**ATTESTED BY:**

  
**ATTY. LOVELIKA T. BAUTISTA**  
Chief, PRB Secretariat Division

**APPROVED:**

  
**TEOFILO S. PILANDO, JR.**  
Chairman

  
**JOSE Y. CUETO, JR.**  
Commissioner

  
**ERWIN M. ENAD**  
Commissioner

DATE OF PUBLICATION IN THE  
BUSINESS MIRROR : *Sept. 02, 2022*  
DATE OF EFFECTIVITY : *Immediately*

**SYLLABI FOR THE SUBJECTS IN THE  
BOARD LICENSURE EXAMINATION FOR SANITARY ENGINEERS**  
Series 2021

Section 4 of the Sanitary Engineering Law (Republic Act. 1364) vests the Board of Sanitary Engineering the authority to discharge other duties in regard to the ethical and technological standards of the Sanitary Engineering Profession in the Philippines. Section 131 of the same Act enumerates the subjects in which the applicants for certificates of registration shall be examined.

The Primary Objective of the modified syllabi for the subjects in the Sanitary Engineering licensure examination is to obtain valid and reliable information to identify the technical competence required for admission to the profession. Technical competence in this respect includes not only technical knowledge but also the ability to apply such knowledge skillfully with good judgement and understanding of professional responsibility.

The subject shall have an approved Table of Specifications that will harmonize with the curriculum in the undergraduate level complementing the program outcomes that will adhere into the level of achievement such as knowledge, comprehension, analysis, synthesis and evaluation.

The syllabi are intended to guide prospective candidates in preparation for the Sanitary Engineering Licensure Examination. In general, the covered areas in which the examinees are expected to have knowledge, understanding and competencies upon entry to the Sanitary Engineering Profession.

**I. COVERAGE**

The general coverage of the outcomes-based competency examination is divided into six (6) major subjects with its corresponding weights as follows:

<u>MAJOR SUBJECTS</u>	<u>WEIGHTS</u>
1. Civil Engineering	10% (8AM to 12NN, 1 <sup>st</sup> Day)
2. Public Health Engineering	18% (1PM to 5PM, 1 <sup>st</sup> Day)
3. Environmental Engineering	18% (8AM to 12NN, 2 <sup>nd</sup> Day)
4. Sanitary Science as Applied to Buildings	18% (1PM to 5PM, 2 <sup>nd</sup> Day)
5. Wastewater and Urban Drainage	18% (8AM to 12NN, 3 <sup>rd</sup> Day)
6. Water Supply Engineering	18% (1PM to 5PM, 3 <sup>rd</sup> Day)

Each major subject is subdivided into specific topic or concerns, as well as its corresponding sub items. These syllabi are intended to serve as frame of reference for the regulatory board, the academe, applicants for the examination and for the council of continuing education program.

**II. EXAMINATION STANDARDS AND NATURE**

- The following shall be taken into consideration in the preparation of examination questions.
- a. A relatively uniform standard of technical competence should be established and consistently followed to ensure the reliability of examination results. Such as, questions given in the examination in each subject shall be comprehensive and well balanced in style.
  - b. Questions shall emphasize technical knowledge that is currently relevant to Sanitary Engineering practice and adequately disseminated in textbooks and other professional literature. Trivial, outdated, inapplicable, unsettled and controversial questions shall be avoided.
  - c. There shall be a suitable mixture of easy, moderate and difficult questions as categorized according to degree of difficulty.
  - d. Questions shall be framed in a clear and concise manner taking into consideration the degree or level of knowledge or proficiency for each topic. Instructions or requirements should be clearly stated.



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- e. Questions should include adequate tests of higher cognitive abilities. Such as comprehension, interpretation, application, analysis, problem-solving and other higher-order thinking skills.
- f. The assigned weight for each test question and the estimated time for each major subject shall be indicated.
- g. Electronic and scientific calculators are allowed. However, programmable calculators and pocket personal computers are not allowed and will be confiscated if brought to the examination room

### III. SUBJECTS FOR EXAMINATION

#### 1. Sanitary Science as Applied to Buildings (18%)

##### 1.1 Basic Principles of Plumbing

- 1.1.1 Basic Principles of Plumbing Systems

##### 1.2 Engineered Plumbing System Design

- 1.2.1 Hot and Cold Water Distribution System
- 1.2.2 Sanitary and Storm Drainage system
- 1.2.3 Engineered Design of Plumbing System

##### 1.3 Fire Protection System Design

- 1.3.1 Basic Principles of Fire Protection System
- 1.3.2 Design of Building Fire Sprinkler System

##### 1.4 Pertinent Laws, Codes, Ordinances, Rules, Regulations, and other Issuances.

#### 2. Civil Engineering (10%)

##### 2.1 Mathematics

- 2.1.1 Calculus 1& 2
- 2.1.2 Differential Equations
- 2.1.3 Engineering Data Analysis

##### 2.2 Natural and Physical Sciences

- 2.2.1 Chemistry for engineers
- 2.2.2 Physics for engineers
- 2.2.3 Geology

##### 2.3 Basic Engineering Sciences

- 2.3.1 Statics and Dynamics of Rigid Bodies
- 2.3.2 Strength of Materials
- 2.3.3 Engineering Economics

##### 2.4 Professional Courses:

- 2.4.1 Principles of surveying
- 2.4.2 Theory of structures
- 2.4.3 Principles of Reinforced Concrete
- 2.4.4 Hydraulics
- 2.4.5 Hydrology
- 2.4.6 Construction and Project management

#### 3. Public Health Engineering (18%)

##### 3.1 Control of Communicable and Non-communicable diseases

- 3.1.1 Microorganisms and causative agents
- 3.1.2 Channels and vehicles of infection
- 3.1.3 Transmission and Control of Communicable Disease

##### 3.2 Sanitation and Hygiene

- 3.2.1 Principles of Public Health
- 3.2.2 Sanitation in Public Places, Health Care, & Recreational Facilities
- 3.2.3 Industrial Hygiene, and Occupational Life and Safety
- 3.2.4 Safe Disposal of dead bodies

##### 3.3 Vital Health Indices

- 3.3.1 Biostatistics and Statistics

##### 3.4 Insect and vermin Control

- 3.4.1 Mosquitoes, Rodents and Disease Control
- 3.4.2 Insects and Pests Control

##### 3.5 Food and Milk Sanitation

- 3.5.1 Food and Milk Sanitation

##### 3.6 Pertinent Laws, Codes, Ordinances, Other Issuances, etc



## **4. Environmental Engineering (18%)**

### **4.1 Ecology and Ecosystem**

- 4.1.1 Air, Land, Water & Biological Environment
- 4.1.2 Flood Forecasting and Control
- 4.1.3 Environmental Protection and Sustainable Development

### **4.2 Environmental Impact assessment, Concepts and Use**

- 4.2.1 Environmental Risk Assessment
- 4.2.2 Health Risk Assessment
- 4.2.3 Methods of Impact Assessment

### **4.3 Solid Waste Engineering**

- 4.3.1 Principles of Solid Waste Management
- 4.3.2 Solid Waste Collection Treatment and Disposal
- 4.3.3 Sanitary Landfill

### **4.4 Environmental Protection and Pollution Control**

- 4.4.1 Air and Water Quality Management
- 4.4.2 Water, Land and Noise Pollution Abatement & Control
- 4.4.3 Hazardous Waste Management

### **4.5 Pertinent Laws, Codes, Ordinances, Rules, Regulations, and other Issuances**

## **5. Wastewater and Urban Drainage Engineering (18%)**

### **5.1 Wastewater Engineering**

- 5.1.1 Basic Principles of Wastewater Engineering
- 5.1.2 Microbiology and Parasitology
- 5.1.3 Wastewater Quantity and Waste Water Characteristics

### **5.2 Wastewater Treatment Facility and Sludge Disposal**

- 5.2.1 Wastewater Treatment Methods and Processes
- 5.2.2 Septage Treatment and Sludge Disposals

### **5.3 Sanitary and Storm Sewerage System**

- 5.3.1 Hydrology and Rainwater Forecasting
- 5.3.2 Pipe Selection and Sewer Appurtenances
- 5.3.3 Design of Sanitary and Storm Sewerage System
- 5.3.4 Construction and Installation of Sewer

### **5.4 Pertinent Laws, Codes, Ordinances, Rules, Regulations, and other Issuances**

## **6. Water Supply Engineering (18%)**

### **6.1 Water Resources Engineering**

- 6.1.1 Water Supply Planning & Development
- 6.1.2 Ground Water Development and Exploration
- 6.1.3 Surface Water Development and Impounding Reservoir

### **6.2 Water Treatment and Purification**

- 6.2.1 Microbiology and Parasitology
- 6.2.2 Sanitary Water Chemistry
- 6.2.3 Water Treatment Methods and Purification Processes

### **6.3 Design of Water Distribution Networks**

- 6.3.1 Analysis and Design Distribution Networks
- 6.3.2 Water Supply System Structures and Appurtenances

### **6.4 Waterworks Management and Operations**

- 6.4.1 Water Systems Development
- 6.4.2 System Operation and Maintenance
- 6.4.3 Non-revenue Water Reduction & Optimization

### **6.5 Pertinent Laws, Codes, Ordinances, Rules, Regulations, and other Issuances**



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**Table of Specifications**  
in \_\_\_\_\_

**BOARD of SANITARY ENGINEERING**  
**as of JANUARY 2022**

PQF Descriptor Level 6								
Difficulty Level			Easy (30%)		Moderate (50%)	Difficult (20%)		
Bloom's Taxonomy			Remembering	Understanding	Applying	Analyzing	Evaluating	Creating
Topics and Outcome	Weight	No. of Items						
<b>1. SANITARY SCIENCE APPLIED TO BUILDINGS</b>	<b>18%</b>	<b>100</b>						
<b>1.1 Demonstrates knowledge and application of principles of Plumbing system</b>	6.66	<b>37</b>						
1.1.1 Develops knowledge on principles of plumbing system	6.66	37	11		19	7		
<b>1.2 Engineered Plumbing System</b>	9.00	<b>50</b>						
1.2.1 Applies principles of design in building water distribution system	4.5	25	5	5	10	5		
1.2.2 Applies principles of design in building sanitary and storm drainage system	4.5	25	5	5	10	5		
<b>1.3 Fire Protection System</b>	<b>1.44</b>	<b>8</b>						
1.3.1 Applies knowledge of the principles of fire protection system	0.54	3			3			
1.3.2 Analysis the design of fire sprinkler system	0.90	5				5		
<b>1.4 Applies Pertinent Laws, Codes, Ordinances &amp; other Issuances</b>	0.90	<b>5</b>			5			
<b>2. CIVIL ENGINEERING</b>	<b>10%</b>	<b>100</b>						
<b>2.1 Mathematics</b>	1.00	10						
2.1.1 Applies basic mathematical computations in engineering	0.40	4			2	2		
2.1.2 Applies calculus and differential equations to solve engineering problems	0.40	4			2	2		
2.1.3 Performs engineering data analysis	0.20	2			2	2		
<b>2.2 Natural and Physical Science</b>	1.00	<b>10</b>						
2.2.1 Applies knowledge in chemistry for engineers	0.40	4	1		2	1		
2.2.2 Applies knowledge in physics for engineers	0.40	4	2		1	1		
2.2.3 Applies knowledge in principles of geology	0.20	2	1		1			
<b>2.3 Basic Engineering Sciences</b>	3.00	<b>30</b>						
2.3.1 Utilize skills in states and dynamics in rigid bodies in solving engineering problems.	0.10	10			7	3		
2.3.2 Applies knowledge of strength of materials in engineering design	0.10	10			7	3		
2.3.3 Applies knowledge in engineering economics	0.10	10	3		5	2		
<b>2.4 Professional Courses</b>	5.00	<b>50</b>						
2.4.1 Applies the principles of surveying	0.50	5	2		2	1		



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2.4.2 Demonstrates knowledge in theory of structures	0.50	5	2		2	1		
2.4.3 Applies basic principles of reinforced concrete in eng'g design	1.00	10	3		5	2		
2.4.4 Applies hydraulics to sanitary engineering problems	1.00	10	3		5	2		
2.4.5 Demonstrates knowledge and application in hydrology	1.00	10	3		5	2		
2.4.6 Demonstrate skills in construction and project management	1.00	10	3		5	2		
<b>3. PUBLIC HEALTH ENGINEERING</b>	<b>18%</b>	<b>100</b>						
<b>3.1 Control of Communicable and Non-communicable Disease</b>	<b>9.00</b>	<b>50</b>						
3.1.1 Applies knowledge about micro-organisms and their causative factors	5.40	30	9		15	6		
3.1.2 Analysis the channels and vehicles of infection	1.80	10	3		5	2		
3.1.3 Applies knowledge in transmission and control of communicable disease	1.80	10	3		5	2		
<b>3.2 Sanitation and Hygiene</b>	<b>6.63</b>	<b>35</b>						
3.2.1 Applies knowledge and principles in public health	3.60	20	4	2	10	4		
3.2.2 Demonstrates knowledge in sanitation in public places, health care, & recreational facilities	1.80	10	3		5	2		
3.2.3 Applies the principles in Industrial hygiene, occupational life & safety	0.54	3			2	1		
3.2.4 Applies knowledge in the disposal of dead bodies	0.36	2			2			
<b>3.3 Vital Health Indices</b>	<b>0.36</b>	<b>2</b>						
3.3.1 Applies the principles of biostatics and biostatistics	0.36	2			2			
<b>3.4 Insects and Vermin Control</b>	<b>0.90</b>	<b>5</b>						
3.4.1 Demonstrates knowledge about mosquitos, rodents and decease control	0.54	3	1		1	1		
3.4.2 Applies knowledge in Insects and pests control	0.36	2	1		1			
<b>3.5 Food and Milk Sanitation</b>	<b>0.90</b>	<b>5</b>						
3.5.1 Demonstrates knowledge in food and milk sanitation		5	2		2	1		
<b>3.6 Pertinent Laws, Codes, Ordinances &amp; Other Issuances</b>	<b>0.54</b>	<b>3</b>			3			
<b>4. ENVIRONMENTAL ENGINEERING</b>	<b>18%</b>	<b>100</b>						
<b>4.1 Ecology &amp; Ecosystem</b>	<b>5.40</b>	<b>30</b>						
4.1.1 Applies knowledge in the management of air, land, water and biological environment	2.70	15	2	3	7	1	2	
4.1.2 Demonstrate knowledge in flood forecasting and control	0.90	5		2	2	1		
4.1.3 Applies principles in environmental protection & sustainable development	1.80	10	2	1	5	1	1	
<b>4.2 Environmental Impact Assessment</b>	<b>1.80</b>	<b>10</b>						
4.2.1 Applies concepts & methods in environmental risk assessment	0.70	4	1		2		1	
4.2.2 Applies knowledge in health risk assessment methods	0.70	4		1	2	1		



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4.2.3 Applies Impact assessment methods and procedures	0.40	2	1		1			
<b>4.3 Solid Waste Management</b>	<b>5.40</b>	<b>30</b>						
4.3.1 Applies principles & methods in solid waste management	2.70	15	2	3	7	1	1	1
4.3.2 Applies solid waste collection, treatment and disposal	1.80	10	1	2	5	1	1	
4.3.3 Analyze Design of a sanitary landfill using relevant principles	0.90	5	1	1	2	1		
<b>4.4 Environmental Protection &amp; Pollution Control</b>	<b>4.50</b>	<b>25</b>						
4.4.1 Applies knowledge in air and water quality management	0.40	2	1		1			
4.4.2 Applies principles in air, water, noise pollution abatement & control	2.50	15	3	2	7	2	1	
4.4.3 Applies knowledge in hazardous waste management	1.60	8	2	1	4		1	
<b>4.5 Pertinent Laws, Codes, Ordinances and Other Issuances</b>	<b>0.90</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>2</b>		<b>1</b>	
<b>5. WASTEWATER AND URBAN DRAINAGE ENGINEERING</b>	<b>18%</b>	<b>100</b>						
<b>5.1 Waste Water Engineering</b>	<b>10.80</b>	<b>60</b>						
5.1.1 Applies basic principles in waste water engineering	7.20	40	7	6	20	3	4	
5.1.2 Applies basic principles of microbiology and parasitology	1.80	10	2	1	5	1	1	
5.1.3 Determines waste water quantity and its characteristic	1.80	10	1	2	5	1	1	
<b>5.2 Waste Water Treatment and Disposal</b>	<b>3.60</b>	<b>20</b>						
5.2.1 Applies waste water methods and practices	2.70	15	2	3	7	2	1	
5.2.2 Demonstrates knowledge in septage treatment & sludge disposal system	0.90	5	1	1	2	1		
<b>5.3 Design of Storm Drainage System</b>	<b>2.70</b>	<b>15</b>						
5.3.1 Applies knowledge in hydrology and flood forecasting.	0.90	5	1	1	2	1		
5.3.2 Applies knowledge in pipe selection and design of sewer appurtenances	0.54	3	1		2			
5.3.3 Evaluates design of sanitary and storm sewerage system	0.90	5	1	1	2	1		
5.3.4 Applies knowledge in construction & installation of sewer lines and appurtenances	0.36	2	1		1			
<b>5.4 Pertinent Laws, Codes, Ordinances &amp; Other Issuances</b>	<b>0.90</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>		
<b>6. WATER SUPPLY ENGINEERING</b>	<b>18%</b>	<b>100</b>						
<b>6.1Water Resources Engineering</b>	<b>3.60</b>	<b>20</b>						
6.1.1Applies knowledge in water supply planning and development	0.90	5		2	2	1		
6.1.2 Applies knowledge in ground water development & water source exploration	1.80	10	1	2	5	1	1	
6.1.3 Applies the principles of surface water development & impoundment	0.90	5	1	1	2	1		



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6.2 Water Treatment and Purification	3.60	20						
6.2.1 Applies principles of microbiology in waste water management and purification	0.90	5	1	1	2	1		
6.2.2 Applies principles of water chemistry in waste water management and purification	0.54	3	1		2			
6.2.3 Applies water function treatment and purification	2.16	12	2	2	6	1	1	
6.3 Water Distribution System	5.40	30						
6.3.1 Evaluates designs of water distribution waste works and applies principles of design of water supply system and appurtenance	4.86	27	5	5	13	2	2	
6.3.2 Design of water supply system structures & appurtenances	0.54	3	1		2			
6.4 Waterworks Management and Operations	4.50	25						
6.4.1 Water supply systems design and development	0.90	5		2	2	1		
6.4.2 Applies knowledge in water supply operation and maintenance	3.06	17	3	2	9	1	1	1
6.4.3 Applies knowledge in none revenue water reduction and optimization	0.54	3	1		2			
6.5 Pertinent Laws, Codes, Ordinances & Other Issuances	0.90	5	2		2	1		
TOTAL	100%							



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