Biotility™ APPLIED BIOTECH TRAINING

UF Center of Excellence for Regenerative Health Biotechnology UNIVERSITY of FLORIDA

BACE Biotechnician Assistant Credentialing Exam

AY 23-24 CBT

CANDIDATE INFORMATION BULLETIN FOR COMPUTER-BASED TESTING

Table of Contents

Introduction to the BACE

Earning your Biotechnician Assistant Credential demonstrates a solid foundation in the knowledge and skills needed in today's biotech workforce. Whether your objective is to work in academia or private industry, this credential proves to your future employers that you have dedicated time and effort to become the best in your field.

The Biotechnician Assistant Credential is an industry-recognized credential designed to verify that a candidate (which is you) has mastered the foundational concepts and skills identified by the bioscience industry as valuable in a workplace setting. To earn the credential, you must demonstrate proficiency in biotechnology theory and techniques by passing the Biotechnician Assistant Credentialing Exam (BACE). The BACE is offered through Biotility at the University of Florida's Center of Excellence for Regenerative Health Biotechnology (UF CERHB).

The BACE consists of two portions. The BACE Knowledge and Practical portions are administered as one online assessment delivered on the University of Florida's education platform, UF e-Learning, under the observation of an Exam Proctor. The exam is taken in a computer lab or a standard classroom using your personal computer.

For a detailed look at the structure and topics covered on the BACE, please refer to the Exam Specifications provided in this document.

How Your Score is Calculated

To pass the BACE and earn your Biotechnician Assistant Credential, you must achieve an overall score of 80%. Candidates may see their score results through UF e-Learning. Official Exam Site Score Reports are sent to the Exam Site within two (2) weeks of processing.

Exam Attempts and Retake Policy

You are permitted to take the exam a maximum of three times per year. Be sure to check with your Exam Site, as there may be extra fees for additional attempts. Candidates who take the BACE are permitted to retake the exam at a reduced rate prior to the end of the calendar year. Exams taken after the end of the calendar year return to full cost.

Obtaining Credential Certificates and Records

Within two (2) weeks of passing the BACE, electronic credentials are issued. Electronic credentials are issued as a digital certification and a badge from Accredible. These credentials may be displayed on Facebook or LinkedIn, and digitally verified online by anyone. For more information, review the Digital Credentials section of this document.

Accommodating persons with disabilities/IEP

Candidates with disabilities or an Individualized Education Program (IEP) are eligible for exam accommodations; however, all accommodations must be coordinated prior to the testing date. If you need exam accommodations, please inform your Exam Site immediately.

Exam Rules

Read the following rules and policies carefully. Violations of the following standards will result in the invalidation of your exam scores. The following rules must be observed at all times during the exam session.

- You are not permitted to start your exam until instructed by a proctor.
- You are not permitted to communicate with other candidates during the exam. If you have a question during the exam, raise your hand and a proctor will assist you.
- This is a CLOSED book exam. You are not permitted to search external references for answers during the exam. External references include but are not limited to books, notebooks, or the internet.
- Personal items are NOT permitted at your desk. Examples of personal items include but are not limited to electronic devices (such as cell phones, smart watches, or tablets), food and/or drink, and calculators.
- You are not permitted to leave the Exam Room unless all Exam Materials given to you are collected by a proctor.

Permitted and Prohibited Items

The BACE is a closed book exam. You are NOT permitted to bring any items into the Exam Room. All permitted Exam Materials will be provided by the proctor.

Items Provided by Proctor	Prohibited Items
• Pencil • Scratch Paper **Note: An online calculator will be available inside the exam.**	• No cell phones or other electronic devices • No food or drinks • No reference materials • No personal notebooks or scratch paper

Exam and Candidate Integrity

Academic Honesty

BACE Candidates are expected to behave ethically and honorably. Academic dishonesty includes any action (received or given) that creates an unfair advantage on the exam. Examples of academic dishonesty include but are not limited to:

- Accepting or giving assistance to another candidate during the exam
- Discussing specific exam questions with another candidate or individual
- Copying, photographing, recording, posting, or reproducing exam content in any fixed medium
- Using stolen exam content to prepare for the exam

Academic dishonesty may be reported to Exam Site Personnel or anonymously to Biotility. To report academic dishonesty to Biotility, contact us at 386-462-3181 Option #1 or BACE@research.ufl.edu.

Ensuring Credential Validity

Biotility protects the validity of its credentials by protecting the content of its exams. The Biotechnician Assistant Credentialing Exam (BACE) is the intellectual property of Biotility and the University of Florida, and copyrighted under the laws of the United States.

Biotility reserves the right to withhold exam results or invalidate credentials when evidence of a testing abnormality is detected or reported. Biotility may also elect to pursue all available civil and criminal remedies if its intellectual property rights are violated.

Review and Appeals Process

Any candidate whose scores have been withheld, is denied access to certification, or whose certification has been revoked or suspended has the right to appeal the decision. Biotility has an established review and appeals process for candidates seeking an amendment of this decision. This process offers candidates the opportunity to have concerns heard in a fair, objective forum. However, candidates will not be entitled to receive a copy of either the certification examination or the answers to any questions on the examination. Appeal requests must be submitted in writing to BACE@research.ufl.edu within ninety days of testing.

Preparing for the BACE

Recommended Study References

There are multiple resources available to help you prepare for the examination. So that you are not overwhelmed, we encourage you to prepare a study plan with your Exam Site. The suggested study references are listed below:

- Brown, J. Kirk. Biotechnology: A Laboratory Skills Course (Second Ed.). Hercules, CA: Bio-Rad Laboratories, Inc., 2018.
- Daugherty, Ellyn. Biotechnology: Laboratory Manual (Second Ed.). St. Paul, MN: Paradigm Publishing, Inc., 2017.
- Daugherty, Ellyn. Biotechnology: Science for the New Millennium (Second Ed.). St. Paul, MN: Paradigm Publishing, Inc., 2017.
- Seidman, Lisa. Basic Laboratory Methods for Biotechnology: Textbook and Laboratory Reference (Third Ed.). Boca Raton, FL: CRC Press, 2021.

Biotility's CGMP Review

Biotility's CGMP Review is an overview of the regulations involved when working in a controlled environment, such as current Good Manufacturing Practices (CGMP) and Good Documentation Practices. There is also information on the organization of a typical biotech company and the types of jobs therein. All candidates should review this critical resource prior to testing. This document is available publicly at our Candidate Resources website and within the BACE Online Practice Exam Course.

Online Practice Exams

You are encouraged to take the two Online Practice Exams prior to your scheduled exam date. The Online Practice Exams are an excellent representation of the content you will encounter during the actual exam. You can take the practice exams multiple times. At the end of each quiz, the correct answers will be revealed for your review. If you need assistance gaining access to this free study resource, please contact your Exam Site for your enrollment link.

Additional Practice for Applied Mathematics in Biotechnology

The category Applied Mathematics in Biotechnology covers some of the most rigorous content on the exam including scientific notation, significant digits, correct use of decimals, serial dilutions, solution ratios, conversions, solution calculations, and dilution factor calculations. Additional practice questions are available to help you prepare and build your confidence.

Additional Study Resources

Biotility has created or selected additional free study resources for your use. They are located in this course as a module but can also be found at our Candidate Resources website.

Practice Exam and Exam Enrollment

Candidate enrollment into Biotility courses and exams within UF e-Learning is managed through UF Professional and Workforce Development (UF PWD). This section provides step-by-step instructions for completing the candidate enrollment process for both new and existing users through UF PWD's Destiny One system. However, to sign in to an existing enrollment please refer to the instructions provided under Log in to UF e-Learning.

The Exam Site Administrator receives Enrollment Links directly from Biotility at least one week in advance of the course or testing event window. The Site Administrator is responsible for distributing the Enrollment Links and Discount Code to their candidates. Payment is bypassed by use of the Discount Code during the Candidate Enrollment Process.

Candidate Enrollment

1. Select the Enrollment Link.
2. On the Course Page:
    a. Review the Course Description.
    b. Select the orange plus (+) next to the course offering.
    c. Select **Add to Cart**.
3. In the Cart View:
    a. Candidates registered through an Exam Site should select **Apply Discount** and enter the Discount Code.
    b. Select either **Checkou**t button to proceed.

Account Creation or Confirmation

4. Select the desired school or social account type and sign in to the associated account (Google, LinkedIn, or Microsoft).
5. Follow the prompts to determine if you have an existing Destiny One account or if you need to create one.
    - **New Users:** Enter the required account information (Name and Email, Address and Telephone, and Marketing Preferences).
    - **Existing Users:** Note: Existing users will see their previously entered information populate – confirm that none of the information has changed.
6. Select **Submit** to save your information.

Checkout Process

7. Select the **Cart** icon on the top center of the screen to begin the checkout process.
8. On the Checkout Page:
    a. Confirm the information on screen is correct, then select **Continue Checkout**.
    b. Answer the Questionnaire.
    c. Read the Policy Confirmation, then select **Accept**.
    d. Select **Continue Checkout**.

Tips for Enrolling & Account Creation

- If you do not have an existing school or social account (i.e. Google, LinkedIn, or Microsoft account), you will need to create one.
- Use a social account you can access from your exam site.
- If you have multiple social identities, use the social account connected to your true identity. The account:
    - Must be under your legal name
    - Should have personal information correctly spelled and capitalized
- When providing new personal information to Biotility, always use your legal name and proper capitalization and punctuation.
- Always use the same social account to enroll, create an account, and sign in.
- Preferably, use a social account you will have access to for years to come. If using a school account, make plans to update your contact information with Biotility prior to losing access when you graduate.

9. You will be redirected to the Receipt page. A copy of your receipt and registration confirmation will be sent to the email address on file shortly.

Troubleshooting

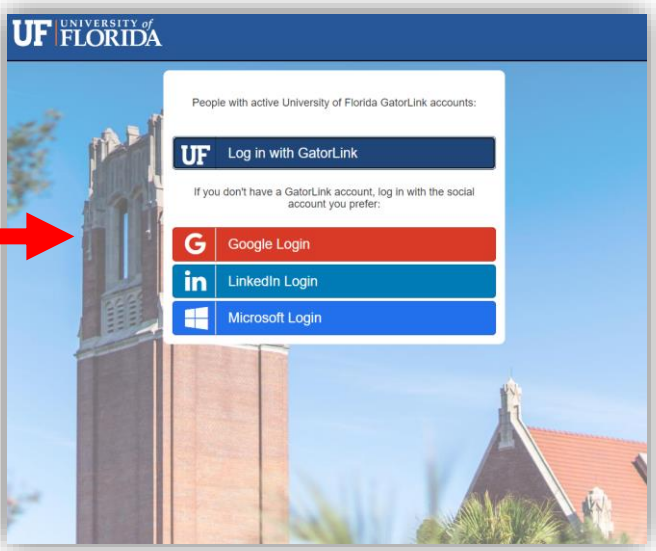
- Not receiving our verification emails? Check your spam folder or update your email settings to allow emails from the following domains.
  - @ufl.edu
  - @cerhb.ufl.edu
  - @research.ufl.edu

Log in to UF e-Learning

To access courses you are enrolled in, follow the steps below:

1. Go to the UF e-Learning sign in page.
2. Select **Log In To Continuing Education**.
3. Sign in with the social account you enrolled through.
4. Once in UF e-Learning, select the appropriate course tile from your dashboard.

Access to the Practice Exam Course and the BACE within UF e-Learning is managed through Enrollment Links. Your Site Administrator will distribute the Enrollment Link to you.



Digital Credentials

Within two (2) weeks of passing the Biotechnician Assistant Credentialing Exam (BACE), Biotility emails a digital credential to the candidate. Candidates receive a branded, secure, and verifiable digital credential. Candidates may place the credential's unique URL in a large variety of places, including:

- Social Media Profiles
- Websites and Blogs
- Digital Resumes
- Email Signatures

By adding a digital credential to these locations, stakeholders, such as admissions officers and potential employers, can view and verify a candidate's credential. They are also linked to information about the BACE and thereby receive a better understanding of the rigor of the credential earned.

Sharing Digital Credentials through LinkedIn

Candidates are provided multiple options for sharing their digital credential. For details on all options available, please visit Accredible's Recipient Knowledge Base.

Adding a digital credential to LinkedIn:

1. Select the elipsis (**...**) menu at the bottom of the credential window, then select **Add to LinkedIn Profile**.
2. A dialog will appear with information needed to copy and paste to the LinkedIn profile.
3. At the bottom of the dialog that appears, select **Open LinkedIn**.
4. Copy and paste the relevant information from the dialog to the LinkedIn form.
5. Once all the information has been copied across, save and close the LinkedIn form.

Credential Verification

To verify a BACE Credential online, stakeholders may visit Accredible's **Verification Tool** and use this to ascertain whether a digital credential has been legitimately published from Biotility. There are three verification methods.

- **Credential Link -** If you know the URL of the credential you would like to verify, input this in the field shown and select **Verify**.
- **Credential ID No. -** If you know the ID No. of the credential you would like to verify, input this in the field shown and select **Verify**.
- **Open Badge Image Upload / How to Verify a Badge -** If you have seen an open badge that you want to check is real, you can copy and upload that badge to Accredible's Verification Tool. It will read the meta-data in that badge image and be able to tell you if it is genuine or not.

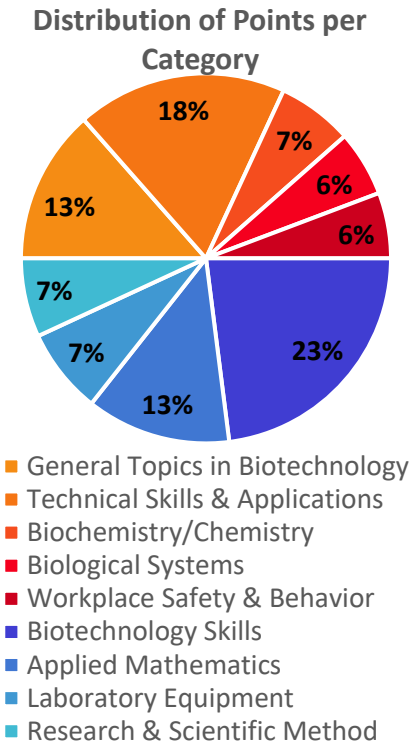
Exam Specifications

The Biotechnician Assistant Credentialing Exam (BACE) consists of both a Practical and Knowledge portion. Candidates take both portions, which cover nine categories, in one session. Candidates must score 80% or above to pass the BACE. Candidates may take the BACE a maximum of three times within a year, with a 20-day waiting period between attempts. **The Computer-Based Testing Option must be administered at an Exam Site with live proctors.** The exam is taken in a computer lab or a standard classroom.

The following descriptions for each portion include the total questions per portion, categories covered, questions per category, points per category, and total points per portion. **The exam is closed book with a duration of 4 hours.**

BACE Knowledge Portion		
Category	**Questions**	**Points**
General Topics in Biotechnology	33	27
Technical Skills & Applications	52	35.5
Biochemistry/Chemistry	17	13
Biological Systems	13	12
Workplace Safety & Behavior	16	12.5
Total	**131**	**100**

BACE Practical Portion		
Category	**Questions**	**Points**
Biotechnology Skills	38	46.5
Applied Mathematics	15	25
Laboratory Equipment	20	14
Research & Scientific Method	16	14.5
Total	**89**	**100**



Detail of Exam Categories

The following is a list of Knowledge and Practical Portion Subjects and their individual topics.

Knowledge Portion Categories

GENERAL TOPICS IN BIOTECHNOLOGY — **Knowledge Portion**

- Discuss current techniques used in biotechnology, and their applications
- Demonstrate knowledge of regulatory agencies governing the manufacture and distribution of biotechnology-derived products
- Outline the development and the regulatory approval process of biopharmaceuticals
- Illustrate examples of the benefits to society of biotechnological advances
- Understand the purpose of Good Laboratory Practices (GLPs) in product testing
- Understand the purpose of Good Clinical Practices (GCPs) in clinical trials
- Discuss the role and identify types of documents used in CGMP compliant industries
- Understand the purpose of current Good Manufacturing Practices (CGMPs)

- Outline the role of various departments in a company, including Research and Development, Quality Assurance, Quality Control, and Manufacturing
- Identify proper workplace safety behaviors
- Describe appropriate workplace behaviors
- Outline the manufacturing process of biopharmaceuticals
- Describe Environmental Monitoring in a controlled space
- Discuss ethics and bioethics in the workplace and society
- Describe careers in the biotechnology field
- Describe historical applications of biotechnology

TECHNICAL SKILLS/APPLICATIONS **Knowledge Portion**

- Describe the process of culturing microorganisms and tissues using aseptic technique
- Discuss the differences between sterilization, decontamination, and disinfection
- Describe the proper use of microscopes
- Understand the principle by which a pH meter works
- Discuss methods of chromosomal and plasmid DNA isolation, purification, and quantification
- Contrast agarose gel electrophoresis and polyacrylamide gel electrophoresis (PAGE)
- Understand how restriction enzymes are used
- Describe recombinant DNA and cloning techniques
- Discuss the transformation or transfection of model organisms
- Describe the mechanism of Polymerase Chain Reaction (PCR)
- Discuss protein expression in model organisms
- Discuss methods of molecule/protein isolation, purification, and quantification
- Understand Western blotting, ELISA, and other immunoassays
- Explain the principles of spectrophotometry
- Demonstrate knowledge of laboratory equipment calibration and validation
- Use scientific notation correctly
- Use significant digits correctly

BIOCHEMISTRY/CHEMISTRY **Knowledge Portion**

- Compare and contrast types of chemical bonds
- Understand the chemistry of molecules and macromolecules
- Discuss the differences between aerobic and anaerobic respiration
- Demonstrate knowledge of enzymes and reaction rates
- Describe DNA structure and function
- Describe transcription
- Describe protein structure and function
- Describe translation and gene expression
- Differentiate between homogeneous and heterogeneous mixtures

BIOLOGICAL SYSTEMS **Knowledge Portion**

- Explain cell theory
- Understand the general physiology of cells
- Explain the interaction between cells, and between cells and their environment
- Describe cell division (meiosis and mitosis)
- Discuss cell staining, and distinguish between Gram positive/negative cells
- Demonstrate an understanding of the immune system
- Understand the genetics of model organisms
- Describe the "central dogma of molecular biology"

WORKPLACE SAFETY & BEHAVIOR **Knowledge Portion**

- Identify Safety Symbols
- Exercise proper laboratory safety protocols
- Describe proper handling of biological and hazardous waste
- Identify and properly use Personal Protective Equipment (PPE)
- Derive information from Safety Data Sheets (SDS)
- Follow practices associated with regulatory compliance
- Demonstrate good documentation practices, including following Standard Operating Procedures (SOPs)
- Properly label items including solutions, buffers, Petri plates, samples, and products
- Identify acceptable work habits

Practical Portion Categories

BIOTECHNOLOGY SKILLS **Practical Portion**

- Accurately measure liquids using micropipettes and serological pipets
- Accurately measure mass using electronic balances
- Demonstrate proper aseptic/sterile technique
- Demonstrate proper culturing of microorganisms
- Demonstrate proper use of electrophoresis equipment
- Properly measure and adjust the pH of a solution with a pH meter
- Properly prepare solutions, buffers, and media
- Properly perform a serial dilution
- Describe the applications and proper use of a spectrophotometer
- Describe the proper use of a centrifuge
- Use 24-hour time correctly

APPLIED MATHEMATICS IN BIOTECHNOLOGY **Practical Portion**

- Use scientific notation correctly
- Use significant digits correctly
- Perform calculations for serial dilutions
- Perform calculations using dilution ratios
- Make conversions within the metric system, and use metric measurements

- Solution preparation:
  - Solve Volume/Volume (V/V) solution calculations
  - Solve Weight/Volume (W/V) solution calculations
  - Solve Molarity solution calculations
  - Solve Dilution Factor calculations
- Generate a graph using collected data:
  - Apply Beer's Law
  - Generate a standard curve
  - Properly plot data
  - Interpret data

LABORATORY EQUIPMENT — Practical Portion

- Identify laboratory glassware and equipment
- Demonstrate proper and safe use of equipment (including, but not limited to):
  - Fume hoods
  - Biosafety cabinets
  - Microscopes
  - Electrophoresis equipment
  - Spectrophotometers
  - Micropipettes & serological pipets
  - Electronic balances
  - pH meters
  - Incubators
  - Centrifuges
  - Water baths
  - Stirrers/shakers
  - Vortexers
  - Autoclaves

RESEARCH & SCIENTIFIC METHOD — Practical Portion

- Discuss good experimental design, including the proper use of controls
- Explain the scientific method
- Analyze and interpret data, including the use of statistical analysis
- Explain how to maintain a laboratory notebook
- Discuss various ways of communicating scientific research, including peer-reviewed journals, and presenting posters or talks at meetings
- Read, interpret, and draw conclusions from technical material

Biotility Contact Information

Phone: 386.462.3181 Option #1

Email: BACE@research.ufl.edu

Hours: Monday – Friday, 8AM – 5PM EST

BACE Candidate Website: http://biotility.research.ufl.edu/bace/candidate-resources

UF e-Learning Login Page: https://elearning.ufl.edu