

# BACE

Biotechnician  
Assistant  
Credentialing  
Exam



## Candidate Information Bulletin

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## Introduction to BACE

Earning your Biotechnician Assistant Credential demonstrates a sound 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 is actually two separate exams which may or may not be taken on the same day (your Site Administrator will decide). BACE includes both a knowledge examination and a practical skills evaluation. The Knowledge Exam is given in either a classroom or computer lab and is taken online with a proctor monitoring the exam. The Practical Exam is given in a science lab and is delivered in paper and pencil format under the observation of a skills evaluator.

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%. The score is determined by averaging the highest grade on the Knowledge Exam and the highest grade on the Practical Exam. Candidates may see their score results through UF e-Learning. Exam Site Score Reports are sent to the Exam Site within two (2) weeks of processing. Candidates who register independently are notified by Biotility through email.

### **Exam Attempts and Retake Policy**

You are permitted to take either portion of 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. The deadline to complete both the Knowledge and Practical portion of the BACE is July 15<sup>th</sup>, 2022. Candidates who take the BACE are permitted to retake any portion of the exam until the end of the calendar year (Dec 31<sup>st</sup>, 2022).

### **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.

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## **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.

## **Academic Honesty Policy**

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 the candidate's Exam Site. To report academic dishonesty, contact Biotility at 386-462-3181 Option #1 or [BACE@research.ufl.edu](mailto: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 uses advanced test security techniques and procedures to actively defend its intellectual property. In addition to invalidating or withhold exam results, Biotility reserves the right to pursue all available civil and criminal remedies if its intellectual property rights are violated.

## 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.
- You are not permitted to search external references for answers during the exam. External references include but are not limited to books, notebooks, or internet.
- 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

Both the Knowledge and the Practical exams are closed book. 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

- Pencil
- Basic, non-programmable calculator
- Scratch paper (Knowledge Exam Only)

### Prohibited Items

- No cell phones or other electronic devices
- No food or drinks
- No reference materials
- No personal notebooks or scratch paper

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# 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

## 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.

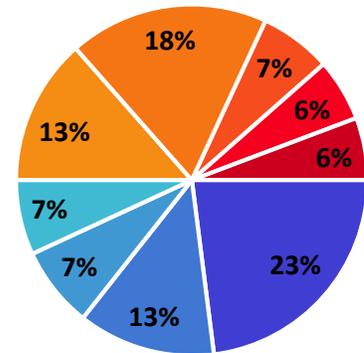
# Exam Specifications

The Biotechnician Assistant Credentialing Exam (BACE) consists of two exam portions, the Knowledge Exam and the Practical Exam, which cover nine core biotechnology categories. The following descriptions for each portion include the exam duration, questions per exam, categories covered, questions per category, and points per category.

BACE Knowledge Exam		
Format:	Closed Book	
Exam Duration:	3 Hours	
Category	Questions	Points
General Topics in Biotechnology	21	23.5
Laboratory Skills/Applications	28	32
Biochemistry/Chemistry	10	11.5
Biological Systems	10	10
Workplace Safety & Behavior	10	10
<b>Total</b>	<b>79</b>	<b>87</b>

BACE Practical Exam		
Format:	Closed Book	
Exam Duration:	4 Hours	
Category	Questions	Points
Biotechnology Skills	19	40
Applied Mathematics	11	22
Laboratory Equipment	16	13
Research & Scientific Method	12	12
<b>Total</b>	<b>58</b>	<b>87</b>

Distribution of Points per Category



- General Topics in Biotechnology
- Technical Skills & Applications
- Biochemistry/Chemistry
- Biological Systems
- Workplace Safety & Behavior
- Biotechnology Skills
- Applied Mathematics
- Laboratory Equipment

## Detail of Exam Categories

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

### Knowledge Exam Categories

#### GENERAL TOPICS IN BIOTECHNOLOGY

#### Knowledge Exam

- 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

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## **LABORATORY SKILLS/APPLICATIONS**

## **Knowledge Exam**

- 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

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## **BIOCHEMISTRY/CHEMISTRY**

## **Knowledge Exam**

- 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

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## **BIOLOGICAL SYSTEMS**

## **Knowledge Exam**

- 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”

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## **WORKPLACE SAFETY & BEHAVIOR**

## **Knowledge Exam**

- 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 Exam Categories**

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### **BIOTECHNOLOGY SKILLS**

### **Practical Exam**

- Accurately measure liquids using micropipets 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

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### **APPLIED MATHEMATICS IN BIOTECHNOLOGY**

### **Practical Exam**

- 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 Exam**

- Identify laboratory glassware and equipment
- Demonstrate proper and safe use of equipment (including, but not limited to):
 

<ul style="list-style-type: none"> <li>○ Fume hoods</li> <li>○ Biosafety cabinets</li> <li>○ Microscopes</li> <li>○ Electrophoresis equipment</li> <li>○ Spectrophotometers</li> </ul>	<ul style="list-style-type: none"> <li>○ Micropipets &amp; serological pipets</li> <li>○ Electronic balances</li> <li>○ pH meters</li> <li>○ Incubators</li> <li>○ Centrifuges</li> </ul>	<ul style="list-style-type: none"> <li>○ Water baths</li> <li>○ Stirrers/shakers</li> <li>○ Vortexers</li> <li>○ Autoclaves</li> </ul>
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### **RESEARCH & SCIENTIFIC METHOD**

### **Practical Exam**

- 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

# Accessing Biotility Courses and Exams

Access to Biotility courses and exams within UF e-Learning is managed through UF Quick Registration (QuickReg) Enrollment Links. How candidates receive Enrollment Links depends on how they register.

- **Individual Registration** - Candidates receive an Enrollment Link Email directly from Biotility within one week of payment.
- **Registration through an Exam Site** - The Exam Site's Site Administrator receives an Enrollment Link Email 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 Link to their candidates.

## Enrollment & Account Creation for New Users

1. Click the Enrollment Link
2. Click "Enroll Now"
3. Select your preferred existing external identity (Google, LinkedIn, or Facebook) and provide the information requested
4. Provide required personal information (Name, Birthdate, Email address, and Phone number)
5. Click Register
6. Verify your account by opening and responding to the QuickReg account confirmation email

## Enrollment for Existing Users

1. Click the Enrollment Link
2. Click "Enroll Now"
3. Login through the same external identity used to enroll and create an account

## Login Process

1. Go to [UF's Quick Registration Login](#) page.
2. Login through the same external identity used to enroll and create an account
3. Select the appropriate course tile

### Tips for Enrolling

- If you do not have a Google, LinkedIn, or Facebook account, you will need to create one.
- Log out of all accounts, including Google, LinkedIn, or Facebook accounts
- Always use the same email address to enroll, create an account, and login
- Not receiving our emails? Check your spam and/or update your email settings to allow emails from the following domains.
  - @ufl.edu
  - @cerhb.ufl.edu
  - @research.ufl.edu
  - @dce.ufl.edu

### Tips for Creating an Account

- Use your legal name
- Check spelling & capitalization of all personal information provided
- Use an email address you can access from the testing location
- Use an email address you will have access to for years to come

### Tips for Logging In

- The Enrollment Link **cannot** be used to login to UF e-Learning
- Bookmark the QuickReg login page!  
<https://reg.distance.ufl.edu/reg/Lms/Login>

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# 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. Click on '...' option at the bottom of the credential window, then click 'Add to LinkedIn Profile'.
2. A pop-up window will appear with information needed to copy and paste to the LinkedIn profile.
3. At the bottom of the pop-up that appears, click on 'Open LinkedIn'.
4. Copy and paste the relevant information from the pop-up window 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 click '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 click 'Verify'.
- **Open Badge Image Upload / How to Verifying a Badge** - If you have seen an open badge that you want to check is real, you can copy and upload that badge to our Verification Tool, it will read the meta-data in that badge image and be able to tell you if it is genuine or not.

# Candidate Support and Resources

## Biotility Contact Information

**Phone:** 386.462.3181 Option #1

**Email:** [BACE@research.ufl.edu](mailto:BACE@research.ufl.edu)

**Hours:** Monday – Friday, 8AM – 5PM EST

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

**UF QuickReg Login Page:** <https://reg.distance.ufl.edu/reg/Lms/Login>