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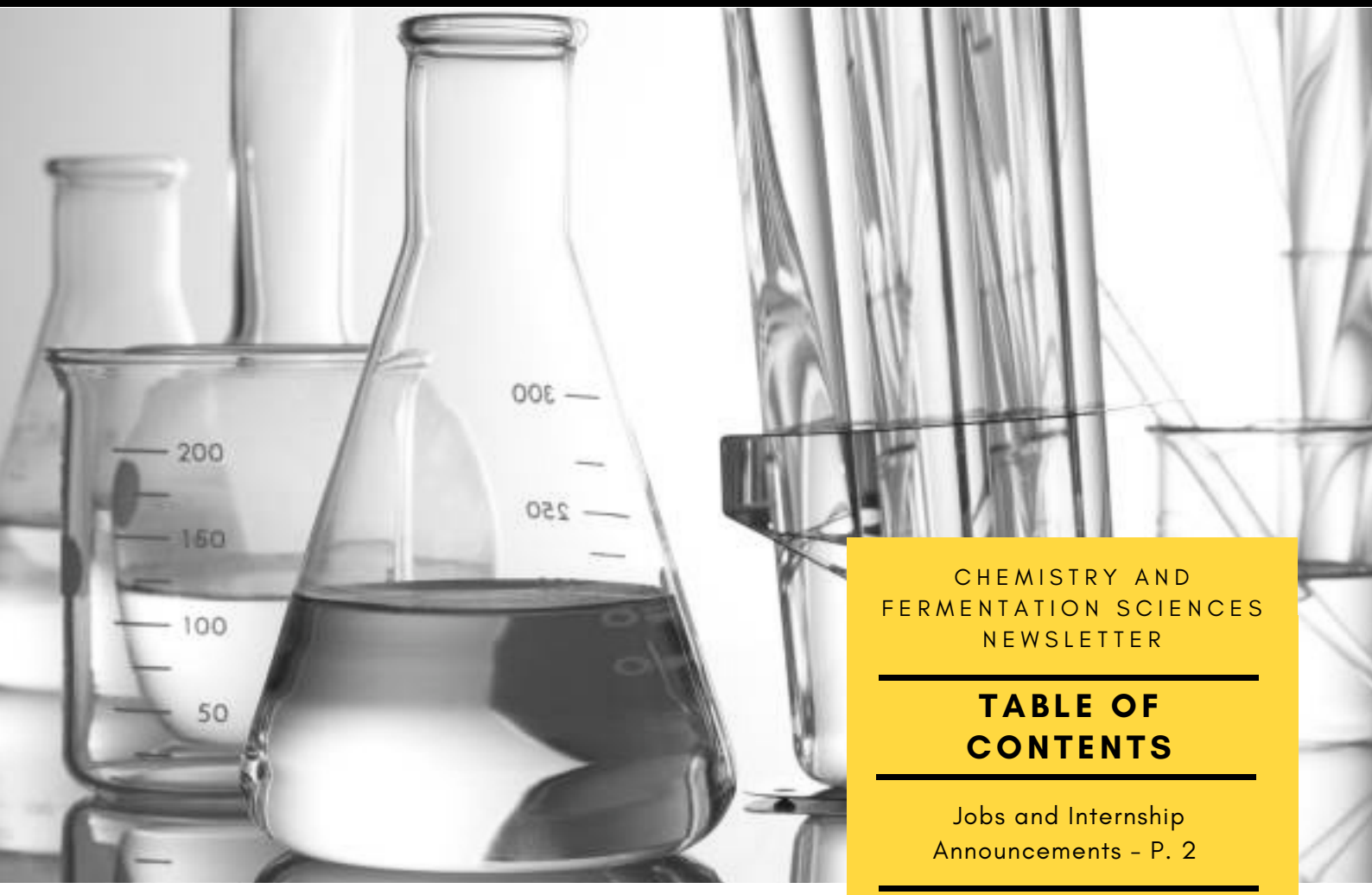
Department of Chemistry and Fermentation Sciences

THE PERIODIC TIMES

STUDENT NEWSLETTER - MAY 2025



CHEMISTRY AND FERMENTATION SCIENCES NEWSLETTER

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WELCOME!

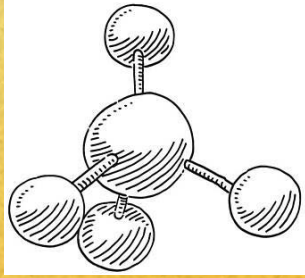
BY EDITORS-IN-CHIEF
EMILY BAKER AND EMILY SAMMONS

Welcome to the May 2025 edition of the Periodic Times! If you are not already familiar, The Periodic Times is a newsletter written by Appalachian State University Chemistry and Fermentation students. This edition features advice on surviving finals, developing strong study habits, and maintaining your mental health during stressful periods of life. Other sections of the newsletter include information about job and internship opportunities, professional development, and faculty, student, and club news. Make sure to check out our Alumni Spotlight, where we interview Megan Pike, a PhD Candidate at NC State University! Lastly, read a little about our very own Luke Darney's experiences presenting his research at the ACS conference in San Diego, CA and his advice to help you during your next presentation! Thank you for reading, and a special thanks to ASU Chemistry and Fermentation students and faculty for their unique and insightful contributions.

JOBS AND INTERNSHIPS FOR GRADUATES AND UNDERGRADUATES

BY ZACKERY JONES

Want to gain more practical skills, develop professional networks, and begin your career the moment you are handed your degree?



Below are links for upcoming internships and job opportunities for the first leg-up in your journey as a chemist, biochemist, or other science centered pursuits!

Job Opportunities

★ **Experis**
Lab Technician
Charlotte, NC
https://www.experis.com/en/job/351249/lab-technician-

★ **EMD Electronics**
Silica R&D Associate Scientist
Charlotte, NC
https://careers.emdgroup.com/us/en/job/285889/Silica-R-D-Associate-Scientist?utm_source=linkedin&utm_medium=phenom-feeds

★ **Indotronix Avani Group**
Laboratory Technician
High point, NC
https://www.linkedin.com/jobs/view/4190979871/?alternateChannel=search&refId=rqeSO%2FkTqaHNB536JEKVuw%3D%3D&trackingId=3caMESPKWGYq6%2FsQ1xfkiw%3D%3D

★ **Kymera International**
Research Technician - Coatings & Powders
Triangle, NC
https://www.linkedin.com/jobs/view/4188964066/?alternateChannel=search&refId=b1LtAuA3pzkG4S8LpvpxNg%3D%3D&trackingId=UTNPmKZPcivLAM5gs%2BJgag%3D%3D

Internships

★ **Grifols**
Intern, Bioanalytics chemist
Durham, NC
https://grifols.jobs/rtp-nc/intern-bioanalytics-chemist/15522E68D12B43BE9A2E8F8C4C80CBE8/job/

★ **Purdue Pharma**
QC Laboratory Intern
Wilmington, NC
https://jobs.dayforcehcm.com/en-US/purdue/CANDIDATEPORTALPURDUE/jobs/1530

★ **Exela Pharma Sciences LLC**
Intern, Quality Assurance
Lenoir, NC
https://workforcenow.adp.com/mascsr/default/mdf/recruitment/recruitment.html?cid=215cfcce-2074-4405-b929-b28dfe2fcd83&ccId=19000101_000001&type=MP&lang=en_US&jobId=574980

★ **Precision BioSciences**
Summer Intern - Program & Process Management
Durham, NC
https://www.linkedin.com/jobs/view/4145304190/?alternateChannel=search&refId=8hB%2BLIXfOpYEWMJ7qQstWg%3D%3D&trackingId=tOqNBf3ByutqdNIZYpiaKQ%3D%3D

PROFESSIONAL DEVELOPMENT CORNER

BY TORI JACOBSON

Preparing for a job interview, applying for grad school, and making your resume or cover letter can be very stressful. Being able to have someone to look over everything and give suggestions can be helpful to put forward the best impression possible. The career development center can help you achieve professional success.

Career Studio

You can go to the career studio in the career development center and have peer-to-peer advising if you are looking for help on:

- Major and career exploration
- Resume and cover letter development and reviews
- A personal statement development and reviews
- Free professional headshots
- How to use Handshake and LinkedIn
- Job searching
- Interview preparation

If you don't feel comfortable or don't have time to go in person, a career guide can review your resume and/or cover letter using the email careerguide@appstate.edu

All of these resources are free to use to Appalachian State students.
If you cannot make it during the studio hours or want to get more in-depth career guidance, you can make an appointment with a career coach on Handshake. This career coach can help you with career/major exploration, customizing and tailoring your resume, curriculum vitae, personal statements, mock or practice interview, graduate student or alumni career guidance, leveraging LinkedIn, job and internship searching, and applying for graduate school.

If you would like to get any help from the career development center, you can find them in Room 222 of the Plemmons Student Union at 263 Locust Street Boone, NC 28608; give them a call at 828-262-2180 or email them at careercenter@appstate.edu.

Resume and cover letter tips:

- Customize your resume and cover letter for each job you apply for.
- Highlight any skills and experience you may have.
- Expand on your skills → How can these skills apply to the job you are applying for?
- Keep it concise and professional.
- Use keywords from the job description.
- Use examples of how you can make an impact.
- Sign your resume.
- Address the hiring manager.

Interview tips:

- Prepare by researching the company and position.
- Be confident and have a positive attitude.
- Show professionalism by maintaining eye contact, formal tone of voice, and a firm handshake.
- Be honest with your answers and avoid any negative comments about past employment.
- Prepare questions to ask your interviewer about the position or company.
- Send a follow up note as a thank you whether or not you got the job.
- Acknowledge your nerves with the interviewer if they become noticeable.
- Be enthusiastic when answering questions.

CLUB NEWS

BY JORDAN McLEAN

If you're looking for a way to get more involved on campus, a way to spice up your resume, or even to make some new friends, consider joining a club on campus! From art, to cosplay, to student government, there's surely something out there for everyone.

Chemistry Club

The Chemistry Club meets around two times a month whenever the members are able to in GWH 112! They don't keep it too serious- one week they even played Chemistry Jeopardy. I asked Eric Corley about his experience being a member and he said his favorite part of the club was getting to know other people and professors who are interested in chemistry. It's a great way to make connections! If this club sounds like a good fit for you, head over to Engage and request to join!

Forensic Science Club

This club meets around every other week on Wednesdays from 6-7:15, and any major can join, so don't be nervous if you're not a forensics concentration! Show up and you can expect to watch Forensic Files episodes, see crime scene reconstructions, have guest speakers from the SBI, and even see a bomb demo at the Watauga Gun Club! I'm personally a member of this club and it's been a good way to meet others and get out of my comfort zone while exploring topics that I'm personally interested in. If you're interested as well, head to Engage and join the GroupMe. Their instagram handle is @fsc_asu!

You don't have to join a club related to your major or what you're studying! Some other clubs on campus are the Pickleball club, the Musical Theater club, and Politics club!
https://campusactivities.appstate.edu/

STUDENT NEWS

BY NOAH PAYNE

Seleen Al Horani

Seleen is a chemistry major with a concentration in certified chemist, is currently the president of the Appalachian Chemical Society, is a member of INTAPP (International Appalachian) where she is serving as the apparel coordinator under the PR committee, and works in Dr. Bobadova's research lab.

Seleen started doing research during her first semester at App State when she was a lost transfer student with general chemistry as her only knowledge in her declared major, but it turned out to be the best academic decision she has made. She is currently working on new derivatives of fluorescent BODIPY dyes that are important to enhance for their biological and biomedical applications, using TDDFT, a quantum mechanical theory, to computationally model the derivatives and calculate their spectroscopic properties. She enjoys doing research because it makes her feel less like a student and more like a researcher and a professional, especially when she has a chance to attend a conference and interact with the scientific community and academics out there. Research has also made her enjoy and value everything she's been learning in her chemistry courses because she now recognizes their relevance and application in the real world. A big challenge she has faced in her research career was understanding foreign, advanced concepts about the behavior of electrons in molecular orbitals. She still struggles with some of these concepts but appreciates learning about them.

Her advice to students interested in research is to start as early as possible and to explore the research topics of the faculty in the department you wish to do research in, find something that really interests you, and reach out to the professor to learn more about their research.

STUDENT NEWS

BY NOAH PAYNE

Kaitlyn Kozicki

Kaitlyn is a chemistry major with a concentration in forensic science, is a member of the Forensic Science Club, and works in Dr. Babyak's research lab. She started doing research because she was interested in having a more individual experience working with the instruments used in the chemistry labs and more time to learn from the professor. She chose to work in Dr. Babyak's lab because she enjoyed Quant lab and learning with Dr. Babyak, so she jumped at the opportunity to join her lab. Her current project is determining heavy metal concentrations found in CBD and THC oils via ICP-OES.

What she enjoys most about doing research is getting more individual, hands-on work with the different instruments and learning how to work as a team and communicate in a "chemistry language" with the other group members and the professor. Some challenges she has faced in her research are learning how to write a grant and procedure for the next group of researchers to come into the lab, but Dr. Babyak helped her in understanding how to write them. She recommends that any chemistry student interested in research pursue it. Even if you are a little hesitant or nervous at first, you will learn so much even in the first couple of weeks that will ultimately help you in your chemistry career. It is also a great experience that you can put on your resume!

FACULTY NEWS

BY CAROLINE HARRILL

At Appalachian State University, we are fortunate to have such excellent faculty available to help us reach our educational goals. Immersed in our own academic journeys, we sometimes overlook the hard work and achievements of our professors. Let your professors know how much you appreciate their knowledge, support, and commitment to your education!

Recent publications by faculty members of the Department of Chemistry and Fermentation Sciences here at App State:

- **Glycerol as a Cryoprotectant: An Undergraduate Experiment Using Differential Scanning Calorimetry to Study Glycerol–Water Mixtures**, A. D. Schwab, Journal of Chemical Education 2024 Vol. 101 Issue 4 Pages 1696-1702, DOI: 10.1021/acs.jchemed.4c00102 https://doi.org/10.1021/acs.jchemed.4c00102

- **Synthesis and Regioselective Functionalization of Tetrafluorobenzo-[α]-Fused BOPYPY Dyes**, S. O. Oloo, G. Zhang, P. Bobadova-Parvanova, S. Al Horani, M. Al Horani, F. R. Fronczek, et al., Inorganic Chemistry 2024 Vol. 63 Issue 20 Pages 9164-9174, DOI: 10.1021/acs.inorgchem.4c00499 https://doi.org/10.1021/acs.inorgchem.4c00499

- **Frozen-Core Analytical Gradients within the Adiabatic Connection Random-Phase Approximation from an Extended Lagrangian**, J. E. Bates and H. Eshuis, Journal of Chemical Theory and Computation 2025 Vol. 21 Issue 6 Pages 2977-2987, DOI: 10.1021/acs.jctc.4c01731 https://doi.org/10.1021/acs.jctc.4c01731

- **Bacterial Community Dynamics and Their Fructophilic Properties During Fermentation of Traminette Grape**, Goppold, A., Conradie, L., Oguntoyinbo F. A., A.R. Smith Department of Chemistry and Fermentation Sciences, Appalachian State University, 13 730 River Street, Boone, NC 28608, USA.

- **Reducing Risk: Strategies to Advance Laboratory Safety through Diversity, Equity, Inclusion, and Respect**, A. L. Dunn, D. M. Decker, C. P. Cartaya-Marin, J. Cooley, D. C. Finster, K. P. Hunter, et al., Journal of the American Chemical Society 2023 Vol. 145 Issue 21, Pages 11468-11471, DOI: 10.1021/jacs.3c03627 https://doi.org/10.1021/jacs.3c03627

Dr. Nancy Asen's project, "Structure-function Relationship and Application of Oilseed Protein Isolates or Concentrates Derived from Fermentation-assisted Extraction", received funding for summer 2025. Congratulations!

FACULTY SPOTLIGHT

BY CAROLINE HARRILL

Dr. Bobadova

What is the subject matter of your research group?

My research focuses on computational modeling of a class of fluorescent dyes, named BODIPY (borondipyrromethene), with applications as bioimaging agents and sensitizers for photodynamic therapy (PDT) of cancers. BODIPY dyes absorb and emit energy in the visible and near-IR region of the spectrum, have favorable photophysical and optoelectronic properties, and low cytotoxicity and high cell membrane permeability.

We work in collaboration with the group of Dr. M. Graca H. Vicente from Louisiana State University who performs the experimental synthesis and analysis of the BODIPY dyes, while our group models the ground and excited states of these compounds to explain the experimentally observed photophysical properties, as well as their reactivity and regioselectivity.

Who are your current research students?

I currently have six undergraduate students who are actively working on different projects related to BODIPY. Seleen and Masa Al Horani are working on a series of boron-aza-dipyrromethene (aza-BODIPY) dyes that are a particularly promising class of near-IR emitters. Alexis Lueders and Mina Kim are developing on Seleen and Masa's previous project by working with bis-BF 2 BODIPY dyes named BOPPYs and BOAPYs. Jack Lamm and Alex Sweetman just started this semester and work on a series of substituted 3-Pyridyl BODIPYs. This is related to a previous project that recent graduate Dylan Goliber and current senior Eli Hernandez worked on.

In addition to BODIPY, I often collaborate with Dr. Christian Wallen and his students, most recently senior Katie Baker and last-year graduate Carter Rodgers.

Left to Right: Masa Al Horani, Dylan Goliber, Dr. Petia Bobadova, Seleen Al Horani, Eli Hernandez

FACULTY SPOTLIGHT

BY CAROLINE HARRILL

Dr. Bobadova

What are your research goals/aspirations?

One of the main advantages of BODIPY dyes is the possibility to finely tune their properties through functionalization at different core positions, including all the carbon atoms and the boron center. We examine different structural modifications of BODIPYs with the aim of increasing their applicability in biomedical imaging and PDT. For example, we aim to increase their stability in the body, their solubility in polar solvents, shift their absorption and emission in the red and near-IR region, all while keeping high fluorescence quantum yields.

What is your favorite element and why?

With everything from above, it has to be boron!

What is something you find unique about conducting research with AppState students?

AppState students are very enthusiastic about their research and start looking for research opportunities very early on, even as freshmen! Many of my AppState students start as sophomores. This gives them enough time to end up with several products before graduation. Due to the collaboration with LSU, the students in my research group are exposed to graduate-level research. The collaboration also allows us to frequently publish. Most of my research students end up as co-authors of at least one publication. The record holder for now is the recent graduate Dylan Goliber, who ended up with three publications within his time at AppState!

Each of my students has also been to at least one conference. Just last year, all four of my research students went to the ACS Spring National meeting in New Orleans, LA and then to the 2024 MERCURY in Merced, CA. Two of them also presented at the SERMACS 2024 meeting in Atlanta, GA. All this student travel is possible because of the support from the Department of Chemistry and Fermentation Sciences and the Office of Undergraduate Research.

ALUMNI SPOTLIGHT

BY TORI JACOBSON

Megan Pike

Graduation: Spring of 2022
Degree: Bachelors of Science in Chemistry with ACS Certified Chemist Concentration

What are you up to now?
I am currently in my 3rd year at North Carolina State University to get my PhD in Chemistry. I am in the Theis Lab Group and am currently a PhD candidate.

What class was the class that helped you the most to confirm chemistry was what you wanted to do?
The labs, definitely. For example, in the inorganic lab at App, which I'm not doing anything directly with for my PhD, the professors are the ones that teach them. This is different from some of the things that I have heard from some of my peers here or people that got a chemistry degree from a different university, where they had graduate students teaching the labs. In this, App has a unique opportunity that other universities don't have, also by having these same professors do research about something similar to these topics.

What advice do you have for anyone thinking and on the fence about going into graduate school?
I would definitely say to try getting the PhD because you are getting a free education! They waived some of the fees for me anyways so it can't hurt to try. You can always decide you don't like it and not continue doing it but it would be an amazing opportunity to learn more.

Which professor helped you the most in deciding what you wanted to do?
Dr Babyak and Dr Shaw both pushed me towards a lot of the analytical work when working with them in labs, and they pushed me to apply to graduate school.

What job do you want to be doing in the future if you could get your dream job?
My dream job would be working at a NMR and MRI company to help set them up at the hospital.

Conference Roundup

BY KYLE SHROEDER

The ACS Spring 2025 Meeting and Expo was held on March 23-27, in San Diego, CA. This biannual event had many different presentations from academia and industry! The conference was filled with learning, networking, and so much more! Several App State students got to attend and present their own research. If you missed it this time, the next ACS conference is planned for August 17-21, in Washington, D.C. and we hope to see you there! Now, let's hear about it from someone who attended, Luke Darney!

Where did you go and what did you present? How long have you been working on this project?

We went to the ACS Spring 2025 National Conference in San Diego. I presented my work in the lab of Dr. Brooke Christian on the mechanism by which a protein from tardigrades is able to stabilize other proteins. I have been working on this project for a little over two years.

What helped you prepare for the conference and do you have any advice for others attending conferences in the future?

Practicing presenting the poster (with at least one round in front of others) would be my number one piece of advice. I also would recommend reading over relevant literature to refresh and familiarize yourself with the field you are presenting on. These were my strategies to prepare.

Did you have a favorite part or find something interesting during the conference?

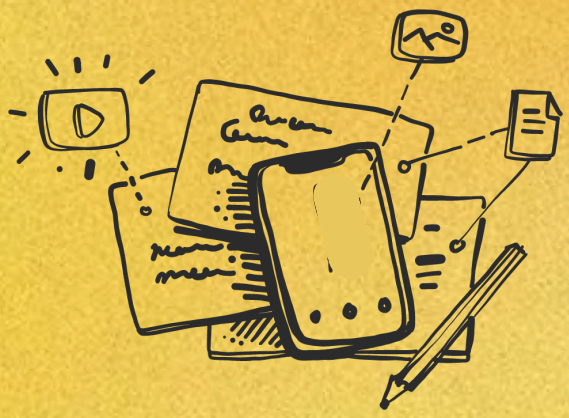
My favorite part of the conference was meeting interesting people. While the conference was very large (I believe there were over 1000 pages of events to scroll through for the whole week), if you are interested in a specific field it would be common to see some of the same people multiple times across different events. Getting to know them, sharing ideas about projects, seeing old friends who you had previously worked with, and talking and learning about their science was my favorite part.

What do you think the most valuable takeaway was from the conference?

The most valuable takeaway that I got was that scientists generally love their field and are happy to help advance it regardless of if it is to their own benefit. At almost every event I went to there were scientists sharing their struggles and others suggesting ideas to help and I found it really exciting for the future of the field that everyone is so interested in helping others for the sake of advancing the field.

NAVIGATING FINALS: BALANCING STUDYING AND MENTAL HEALTH

BY EMILY EDGERTON



As finals approach, it's easy to feel overwhelmed by the pressure to perform well. While studying is important, it's just as important to balance your academic goals with maintaining your mental health. Remember, your well-being is just as important as your grades. Here are a few tips to help you study more effectively while also reducing stress.

Study Tips:

1. Avoid procrastination - While it may be tempting to cram the night before your final, breaking study sessions into smaller chunks over time will help you retain information better. Create a schedule to devote time for each subject, and remember to take regular breaks to recharge.
2. Use effective study techniques - Re-writing down definitions and key concepts can help reinforce what you've learned. Visual aids like flashcards, diagrams, and charts can make the material easier to understand. Also, practicing with past exams or sample questions is a great way to prepare.
3. Lead tutoring/office hours - Don't hesitate to attend review sessions led by lead tutors or visit your professors during office hours if you're struggling with specific topics. Getting extra help can give you the clarity you need to succeed.

App State 2025 Final Exam Dates:

Friday
May 2, 2025
-
Thursday
May 8, 2025

NAVIGATING FINALS: BALANCING STUDYING AND MENTAL HEALTH

BY EMILY EDGERTON

Helpful Reminders:

1. Don't skip sleep - It might be tempting to pull all-nighters to get more studying done, but sleep is important for memory retention and maintaining focus. Aim for 7 or more hours of sleep each night to give your brain the rest it needs.
2. Mindfulness and relaxation - Taking time to unwind can improve your concentration and mood. Practice deep breathing techniques, meditation, or even watch a comfort show or listen to music to calm your mind.
3. Stay active - Regular physical activity is a great way to reduce stress and boost your energy. Whether it's a workout, a walk, or some stretching, moving your body helps clear your mind.
4. Don't forget to nourish your body with balanced meals, stay hydrated, and fuel yourself with fruits, vegetables, and protein.

Need Support? Remember, it's okay to reach out for help if you're feeling stressed, anxious, or overwhelmed. There are resources available to support you:

Counseling Center: Call (828) 262-3180 to schedule an Initial Consultation appointment by phone or visit counseling.appstate.edu for more options.

Tutoring Services: For information on available tutoring resources, visit studentlearningcenter.appstate.edu/tutoring.

WellTrack App: Work through anxiety and depression using the WellTrack app available at appstate.welltrack.com.

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