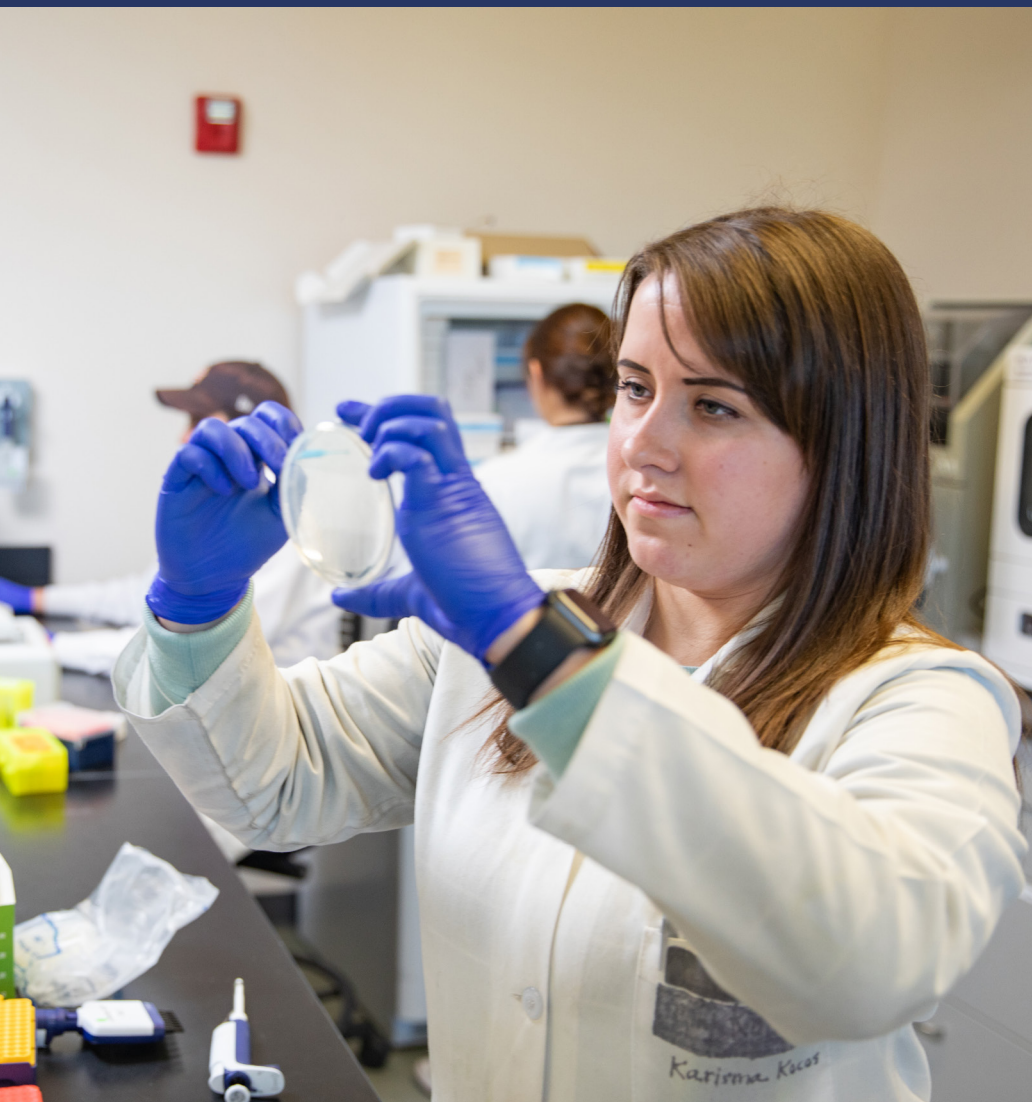# PMI Undergraduate Application

NORTHERN ARIZONA UNIVERSITY

The Pathogen and Microbiome Institute

The Pathogen & Microbiome Institute (PMI) at NAU is an internationally recognized research facility focused on developing technologies to better understand and manage pathogens that affect humans and wildlife.

PMI is committed to the professional development of undergraduate student employees and accepts students from diverse disciplines *(biology, chemistry, computer science, business, graphic design)*. Students in our program work on exciting research projects or provide logistical support (business and IT) under the careful mentorship of faculty, staff, and directors at PMI.

There are over 100 faculty, full-time staff, graduate and undergraduate students currently employed at PMI. Don't miss this opportunity to apply and expand your horizons.

For more information, visit us on Facebook or at pmi.nau.edu.

Find us on Facebook

@PathogenMicrobiomeInstitute

PMI Undergraduate Success Stories

AMALEE NUNNALLY
STARTED MAY 2016

My name is Amalee and I started working at PMI the summer after my freshman year. As an Undergraduate Research Assistant, I worked under Nathan Stone and Heidie Hornstra O'Neill, both Research Project Coordinators, studying reservoirs of *Clostridioides difficile* in the community. Not only did this provide me with a vast number of laboratory skills, but also allowed me to get involved in the community and work on professional development. PMI was the perfect job for a dedicated student. I was constantly engaged in the new projects we were working on and was offered support in applying for grants and scholarships. My supervisors were always understanding of my study schedule and encouraged me to take my time to my best academically. Best of all, when graduation came around, I was able to stay at PMI full time as a Research Technician. I would recommend this job to any student that wants to make a difference in the scientific community and have an impressive CV by the time they graduate!

BENJAMIN LEADEM
STARTED APRIL 2018

The four years I spent as an undergraduate researcher from 2004-2008 in the Keim Lab (or MGGen as it was known back then) were my formative years in science. Under the tutelage of excellent mentors like Heidi Hornstra O'Neill (*Research Project Coordinator*), Talima Pearson (*Assistant Director*), and Dave Wagener (*Director*). I worked on multiple projects tracking outbreaks of the tropical diseases melioidosis and glanders in northern Australia and Thailand via genetic fingerprinting and won two undergraduate research awards at annual NAU research conferences. I loved my time working there; the atmosphere was supportive and stimulating for young scientists while also providing me with the knowledge and basic research skills needed to pursue a career in science at major academic research institutes. After leaving NAU, I went on to get a Ph.D. in human genetics at Johns Hopkins University studying cancer epigenetics. Following that, I did a post-doctoral fellowship at the National Institutes of Health investigating the epigenetic aspects of blood diseases such as sickle cell anemia. I am currently a staff scientist at one of the country's largest genetic testing companies, GeneDx, where I analyze the genomes of patients born with congenital illnesses to identify the genetic etiology of their disease. None of this would have been possible without my start in the Keim LabI and I highly recommend working there as an undergraduate researcher!

AMY VOGLER
STARTED SPRING 1997

I began working in the Keim Genetics Lab (KGL) as a freshman in the spring of 1997, and earned several undergraduate research related awards, including the Cowden Microbiology Fellowship and the Goldwater Scholarship. After graduating, I continued to work at PMI, completing my Ph.D. in December of 2003, and eventually moving into my current role as the Associate Director of the PMI Select Agent BSL3 Operations Core. Since then, I have split my time between ensuring that PMI remains in compliance with the Federal Select Agent Regulations and various research goals. My research accomplishments at PMI include >40 publications and a large number of posters, talks, classes, and other presentations on various research and biosafety topics. I have had the good fortune to participate in many diverse research projects involving multiple pathogens, although my favorite remains *Yersinia pestis*. There are a myriad of reasons that I have remained at PMI for the last 23 years, but the overall support and stimulating research environment are two of the most important. One thing is for sure: It is never boring here, whether that "here" is the "KGL," "MGGen," or "PMI."

Basic Requirements

General Prerequisites

- Must be a full-time NAU undergraduate student in good academic standing.
- Must commit to a minimum of 12 full months of employment.
- Must be willing to submit to a background check *(if hired)*.

Professional Mindset:

- Be committed and dedicated to the job.
- Be prepared for training and evaluation.
- Be open to instruction and feedback.
- Be self-motivated, responsible, and accountable.
- Be proactive. Think ahead towards logistical processes, technical challenges, and professional relationships.
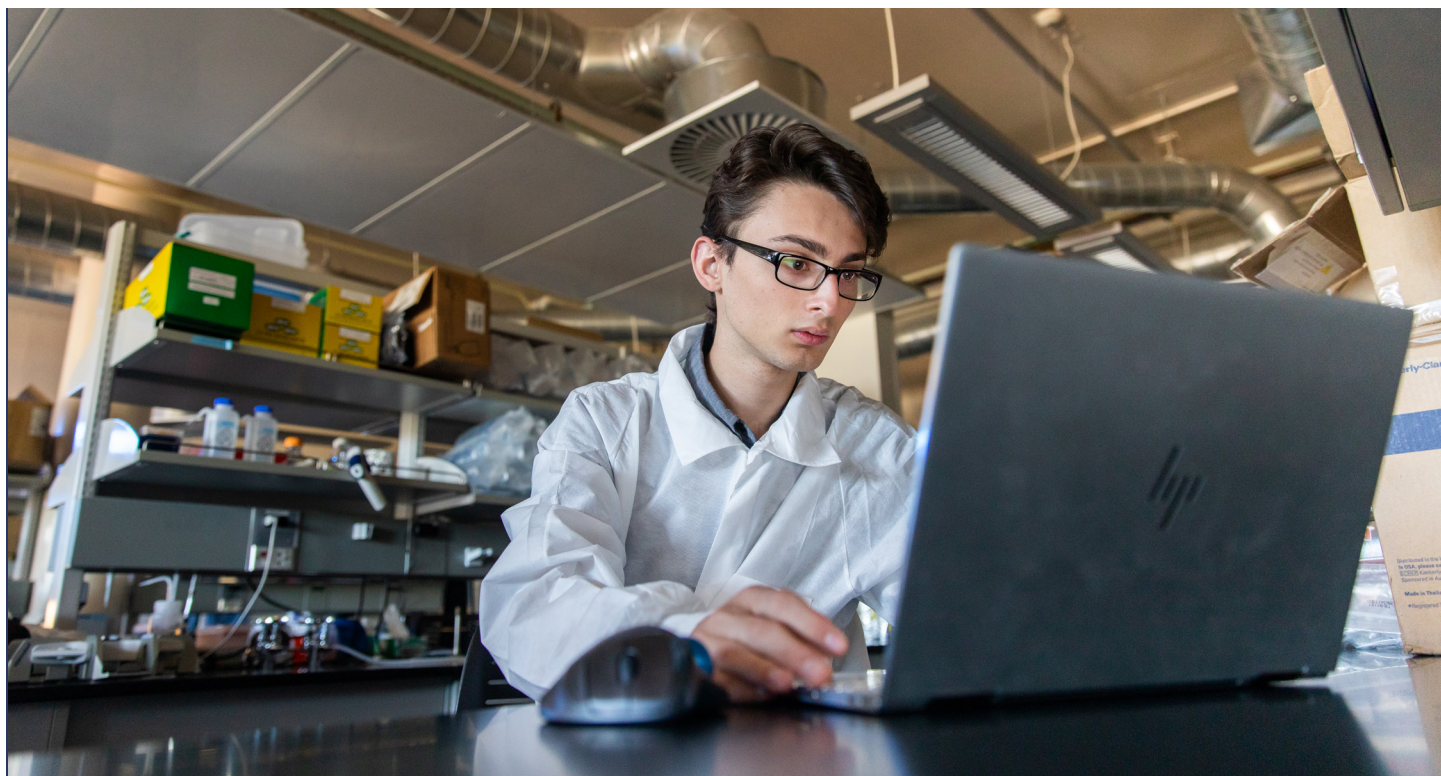
Professional Conduct:

- Fulfill job commitments.
- Communicate with supervisor all relevant work-related information in a timely manner (project or logistical information, project progress, planned or unexpected absences, and other relevant topics deemed important by your supervisor).
- Work as a team with colleagues. Communicate clearly, agree on plans, provide support
- on multiple projects, and follow through on commitments.
  Practice an effective personal organization strategy. Focus on tasks at hand.
- Interact in a respectful and positive manner with other members and teammates.

Should You Apply?

We're an equal opportunity employer. All applicants will be considered for employment without attention to race, color, religion, sex, sexual orientation, gender identity, national origin, veteran or disability status.

Regardless of academic year or area of study, we encourage all undergraduates to apply.

Life Science Emphasis Expectations:

Research Project Duties:

- Perform research to support grant-funded projects at PMI.
- Perform specific molecular techniques that are dependant on supervisor's project needs *(examples include: PCR, DNA sequencing, protein techniques, bioinformatics computational analyses, preparation of chemical stock solutions, and other highly specialized procedures required by your project).*
- Conduct computer data entry while maintaining a detailed and organized lab notebook, writing protocols, and performing calculations for lab work.
- Follow technical procedure protocols; trouble-shoot technical problems.
- Comply with all biosafety and security protocols.

General Laboratory Duties:

- Conduct tasks related to upkeep of lab instruments and computers.
- Contribute to routine lab cleaning every 2 weeks or as needed.
- Resupply lab reagents and supplies by placing orders as needed.
- Lab maintenance *(washing laboratory glassware and equipment, recycling cardboard and styrofoam).*
- Take out lab trash *(on a rotation basis).*

Positional Duties:

- Work with supervisor to setup a weekly work schedule and commit to work those dedicated hours.
    - No less than 15 hrs per week. The most successful students engage in 20-25 hrs of research weekly
    - Summertime work is also important for success.
- Attend weekly lab meetings.
- Attend and actively participate in undergraduate meetings that cover professional development topics that occur every 2 weeks.
- Sign up for BIO485 to receive research credits during fall and spring semesters.

General Job Description:

- Perform research to support grant-funded projects at PMI from fields such as:
    - Genetics/genomics
    - Protein/immunology
    - Bioinformatics/ computational analysis

- Undergraduate research is conducted under the direction of an immediate supervisor

- Students will be given the opportunity to present a research poster at the annual NAU Undergraduate Symposium.

Bioinformatics/Software Engineering Emphasis Expectations:

Position #1 Student Bioinformatician/Data Scientist:

Bioinformaticians at PMI play essential roles in turning data into knowledge. This generally involves working closely with labs generating DNA sequence or other data, and running software on the monsoon supercomputer to address import research questions.

General Office Duties:

- Application of bioinformatics software to perform microbiome, genomics, and other analyses as a member of a multidisciplinary team.
- Assist with bioinformatics analyses.
- Assist with vetting of analyses results prior to publication.
- Communicate analysis steps and results to other researchers, and provide assistance with preparing results for publication.
- Automate analyses using scripting languages.

Preferred Qualifications:

- Experience writing software in Python and/or R, or using data analysis tools such as Jupyter Notebooks or R Studio.
- Experience working with command line software in Linux or macOS environments.
- Some undergraduate statistics coursework.

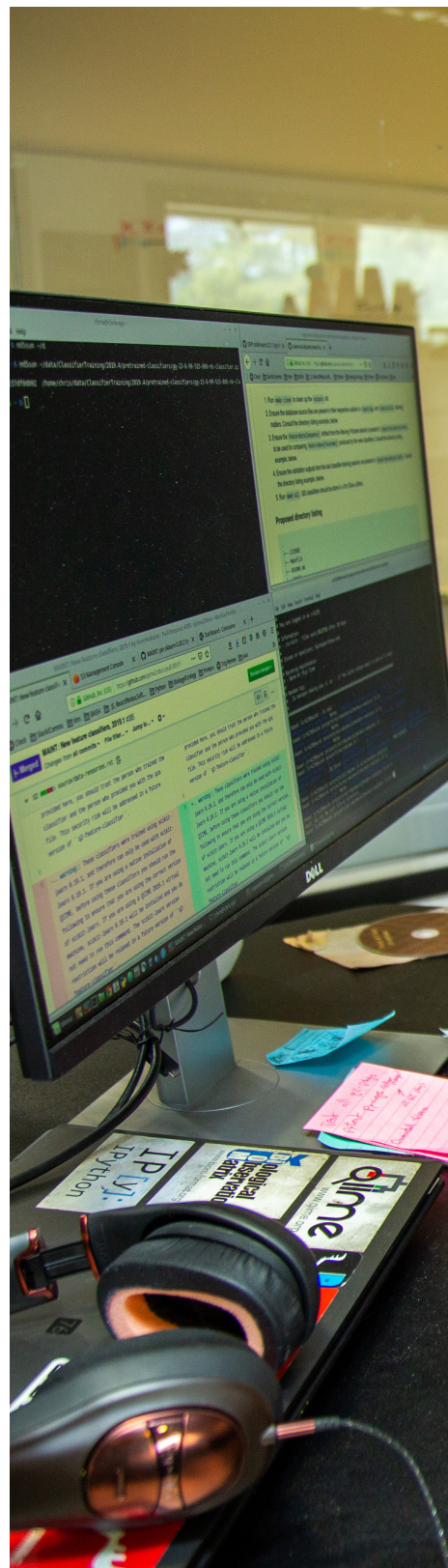## Position #2 Student Research Software Engineer:

Research Software Engineers at PMI develop software to be used in-house and by research teams around the world. In addition to software development, software engineers are closely involved with user support, education, and review of code developed by others.

General Office Duties:

- Develop, test, and document software as a member of a multidisciplinary team.
- User support via online forums, hands-on workshops, email, and in-person or virtual meetings to assist users of software developed at PMI. Occasional travel may be required to assist with teaching bioinformatics workshops, attend conferences or software development "sprints/hackathons", or visit collaborators.
- Detailed iterative code review of software developed by others.
- Periodic pair-programming with other team members.
- Assistance with development of software design plans.
- Preparation and testing of software releases.

Preferred Qualifications:

- Experience with developing and testing software, or integrating with third-party APIs, or with web application development.
- Experience working with command line software in Linux or macOS environments.
- Experience using GitHub.

Business Administration Emphasis Expectations:

General Duties:
- Package/mail managment
- Ordering supplies
- Filing/database management
- Running errands
- Office supplies/equipment management
- Electronic database filing
- Department plant care

Specialized Office Duties:
- Invoice payment
- Reimbursement of purchases
- Create quarterly PMI magazine
- Graphic Design for institute needs and special projects
- Maintain a business purchasing card
- Coordinate meetings and events
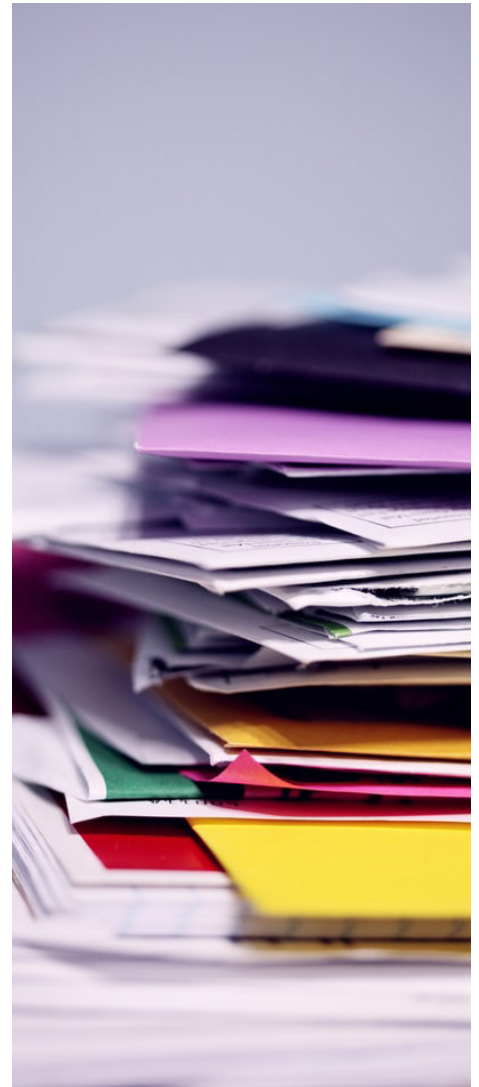- Assist with arrival of guest speakers, research collaborators, and PMI interviewees.

IT Support Emphasis Expectations:

General Duties:
- First line of PMI computer support.
- Support all PMI users with hardware, software and network issues.
- Maintain PCs in computer lab (updates, regular maintenance, etc.)
- Install Win and macOS on PMI computers as needed.
- Upgrade/replace hard drives, RAM, and peripherals as needed.
- Maintain stock of hardware including monitors, keyboards, mice, and drives.
- Maintenance of PMI's WordPress web sites (*training required*).

Preferred Qualifications:
- Knowledge of PC and macOS and hardware.
- Good communication skills.
- Ability to work with diverse PMI faculty, staff, and students.

Additional Materials Required for Application Packet *(see page 9)*

Date: _____

Name: _____   _____   _____
        (Last)   *(First)*   *(MI)*

Phone: _____   NAU Email: _____   NAU ID: _____

Local Address: _____

Permanent Address: _____

Major: _____   Minor: _____   Cumulative GPA: _____

                                                                                               Credits Completed: _____

Current Class Status: ☐ Freshman   ☐ Sophomore   ☐ Junior   ☐ Senior   ☐ Other

Anticipated Graduation Date: _____   How did you learn about this job? _____

Can we make copies of your NAU transcripts?   ☐ Yes   ☐ No

Which Campus do you prefer to work at?   ☐ NAU Campus Only   ☐ TGen North Campus Only   ☐ Either

Are you eligible for Federal Work Study?   ☐ Yes   ☐ No

Will you agree to a background check?   ☐ Yes   ☐ No

Select the emphasis that interests you: ☐ Life Sciences   ☐ Bioinformatics / Software Engineering
(you may select multiple options)

                                                      ☐ Business Administration   ☐ IT Support

Signature: _____

Previous Employment Experience:

Employer: _____

Supervisor: _____

Job Title: _____

Supervisor Contact: _____

Employment Dates: _____

Job Description/Responsibilities

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_____
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Employer: _____

Supervisor: _____

Job Title: _____

Supervisor Contact: _____

Employment Dates: _____

Job Description/Responsibilities

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_____
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Employer: _____

Supervisor: _____

Job Title: _____

Supervisor Contact: _____

Employment Dates: _____

Job Description/Responsibilities

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_____
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References:

Name: _____

Contact: _____

Name: _____

Contact: _____

Name: _____

Contact: _____

Additional Materials Required for Application Packet:

1. Please attach a separate, typed essay addressing the following questions in separate paragraphs:
   - Please describe how your previous work experiences (preferably) or class experiences have developed your professional skills thus far.
   - Why are you interested in further developing your professional, intellectual, and personal skills through science research and discovery?
   - Please describe a time or situation with a job, an organization, or class where a lot of responsibilities were placed on you and you experienced challenges. Please carefully describe why the situation was a challenge. How did you manage the situation?

2. Include a weekly schedule of your available work hours *(example: Mon-Fri schedule when you are available for work).*

3. Include a copy of your resume with your application.

4. Include unofficial transcripts of all college courses you have taken to date *(or high-school transcripts if incoming freshman).*

5. Submit a letter of recommendation from a professor or professional mentor in a sealed signed envelope. If you are a freshman, then a former high school teacher or coach will suffice *(recommendation letter should have original signature and be on letterhead, if possible).*

The completed application packet (pages 7-9) must be hand delivered to PMI during business hours at the Applied Research & Development building *(#56).* The PMI business office is located in suite 210 on the 2nd floor.

Incomplete packets will not be reviewed or made available to hiring committees.
All applications are held for one year from the date you submitted it to the front office. At any time after submitting your application, you may update documents in your packet if you wish or apply again after the one year mark.

Things to Consider:
- Drop off your completed application packet to the below address

  THE PATHOGEN AND MICROBIOME INSTITUTE
  1395 S KNOLES DR
  BLDG 56 RM 210 (2ND FL)
  FLAGSTAFF, AZ 86011

- Ensure that you have all required items in your packet!

- For questions, direct your email to *dawn.birdsell@nau.edu* and copy *ugjobs-pmi@nau.edu*.

OFFICE STAFF USE ONLY

☐ Essay   ☐ Recommendation Letter   ☐ Work Schedule

☐ Unofficial Transcripts   ☐ Resume

Stamp Received

INTERVIEWER USE ONLY *(mark one box per interview)*

☐ References Checked?   ☐ References Checked?

Applicant Interview Date: _____   Applicant Interview Date: _____

☐ References Checked?   ☐ References Checked?

Applicant Interview Date: _____   Applicant Interview Date: _____