Nuclear Power School Prospective Junior Officer Student Information

Congratulations on your acceptance into the Naval Nuclear Propulsion Program and welcome to Naval Nuclear Power Training Command (NNPTC)! The Navy selects only the best and brightest for this program, and we welcome you as you begin your professional training. Below you will find some helpful points which will ensure your smooth transition into Naval Nuclear Power School (NPS). **Please read and execute this document in its entirety, as you will be expected to arrive fully prepared in order to hit the ground running.**

PREPARING FOR YOUR TRANSFER.

1. **Security Clearance Verification.** Immediately upon receipt of your orders, work with your Command Security Manager to verify that you have a final/adjudicated security clearance to the level directed in your official orders to NNPTC. If you do not yet have a final/adjudicated clearance, you will not be permitted to start training at NNPTC. Work with your Command Security Manager to expeditiously satisfy any outstanding security clearance requirements so as to minimize the possibility of a delay to the start of your training.

2. **Housing Search.** Our staff emphatically recommends that you secure housing relatively close to NNPTC to preclude long transit times. The ability to quickly transit to and from work (especially in the afternoons) can significantly improve your quality of life, and several affordable, safe apartment complexes and residential neighborhoods are situated within a 10-15 minute drive of NNPTC. Base housing was recently renovated and is available to students with dependents, and very limited on-base housing for geo-bachelors also exists. The Naval Weapons Station Housing Office can be reached at (843) 794-7218/7219.

3. **Temporary Lodging.** No temporary lodging exists at NWS Charleston, and those requiring temporary living arrangements will have to procure lodging in town. To determine if you are eligible to have up to 10 days of this expense covered as part of your PCS allowance, please contact the ADOD's office. Officers transferring to NNPTC from overseas duty may have additional days available as part of this allowance to account for household good shipment times.

CHECKING INTO NNPTC.

1. **Once you receive your orders to Nuclear Power School (NPS), it is highly recommended you contact the Assistant Director, Officer Department (ADOD) at 843-794-8115 to discuss the timing and conduct of your check-in. We are here to help with your transition to the schoolhouse and encourage you to voice any questions or concerns you may have early and often.** Contact in advance will also help us mutually ensure an efficient use of your time during check-in.

2. **Uniform During Check-in**. The uniform for check-in is the appropriate Summer White or Service Dress Blue uniform per Commander, Navy Region Southeast (CNRSE). Up-to-date seasonal uniform guidance can be found on the CNRSE website (easily found with an internet search) or by contacting the ADOD.

3. **Required Documents.** Arrive at NNPTC on the morning of your check-in day with the following documents in hand:

Documentation Requirements for NNPTC Check-In Room P312	
Original orders (stamped from last command or with loss document)	
Oath of Office (if applicable. Required if reporting from your commissioning source, even if by way of an intermediate stop.)	
DD 214 (if applicable)	
Your most recent FITREP (if applicable). If Block 11 (Detachment of Individual) on your FITREP is not checked, you must also bring your letter of extension.	
SWO designation letter (if applicable)	
SWO Mariner Skills Logbook summary letter (if applicable)	
Your most recent/updated Page 2 Form (Emergency Contact Form), regardless of prior completion (make sure to have SSN, DOB, address, phone number for any dependents).	
License Plate number (for processing Dislocation Allowance)	
Travel Receipts (bring your flight itinerary if flying anytime during travel period, and make sure all hotel receipts are in your name and indicate a zero balance, i.e. paid.)	
Promotion Letter	
Medical and Dental Records	
Documentation Requirements for Acquiring NNPTC Parking/Vehicle Decal	
Vehicle Registration	
Proof of Insurance	
Driver's License	

4. **Personal Electronic Devices**. Be sure to leave all electronic devices in your car (cell phone, PDA, smart watches, FITBITs, noise-cancelling headphones, portable radios, radio headphones, etc.), as they are not permitted in the schoolhouse without pre-authorization. A select number of pre-approved fitness wearables and watches are permitted in the building, and the staff will work with you prior to or during check-in to determine if your device is approved.

5. **Check-in Time.** Check-ins are normally processed Monday through Friday between 0800 and 1400. Quarterdeck watchstanders are available to either escort you to the ADOD's office during working hours or to stamp your orders after hours. If you intend to check in at a time other than the morning, please pre-coordinate this with the ADOD's office to ensure the most efficient use of your time.

6. **Medical and Dental Clinics.** Our medical and dental clinics are separate buildings but are both located adjacent to NNPTC. Their normal business hours are 0800-1630.

PARKING.

1. **Parking Areas.** When parking for initial check-in, continue along NNPTC Circle and look for the second entrance to the command on your left. There is a large sign indicating **commuter parking** as well as designated officer student parking. Overflow parking will be located in the parking lot behind officer student parking near the track. Students are not authorized to park in staff parking.

2. **Parking Sticker.** At the conclusion of your check-in, you will be issued two parking stickers by the Master-At-Arms Office. These stickers are required to be displayed in the bottom left corner of your rear window. In order to receive these stickers, you will need to bring in your registration, proof of auto insurance, and driver's license.

BADGES/QUARTERDECK POLICIES.

1. When you arrive, the Quarterdeck watchstanders will issue you a temporary check in badge and escort you to the ADOD's office. When you cross the Quarterdeck you will pass through a metal detector and the Quarterdeck watch standers will inspect the content of any bags, folders, etc., which you have in your possession. You will need to be escorted throughout the building until you are issued your official badge, which will occur after your clearance is verified and you are briefed by our security office. Badges must be worn on campus at all times on the upper half of your body, and they are important for muster purposes and to log your study hours. If you forget your badge at home, a temporary "No Escort Required" red badge will be issued by the Quarterdeck once your identity is verified. If your badge is "flagged" with an alert when you scan into the building, the Quarterdeck watch stander will ask you to report to the respective office immediately.

GENERAL.

1. **Classroom Hours.** Classroom instructional hours are Monday through Friday, 0700-1520 (Oct-Mar) or 0755-1615 (Apr-Sep).

2. **Uniforms.** The student uniform of the day is NWU Type III with black boots on Monday through Thursday. You will be provided a command ball cap when you arrive. On Fridays, the uniform of the day is khakis with the exception of Nuclear Power School graduation days, which are about every eight weeks. During the summer months, the graduation day uniform is Summer Whites and during the winter months the graduation day uniform is Service Dress Blues.

3. **Holidays/Leave.** NNPTC typically observes all federal holidays as well as a roughly 2-week holiday stand-down period as non-academic days. Non-emergent leave is not typically granted outside these timeframes due to the fast pace of the curriculum, frequent examinations, and the associated effort required after hours. If you have a major life event coming up where leave might be required (e.g. birth of a child), please inform the ADOD as early as possible.

4. **Pay Issues.** The ADOD's office will be able to assist with all issues you may have regarding pay. If you have any questions, please contact the office.

DIAGNOSTIC EXAM.

1. **Diagnostic Exam.** A two and a half hour intake Diagnostic Examination covering math, physics, and thermodynamics topics will be administered prior to the start of Nuclear Power School. You will need to bring pencils, erasers, and an authorized calculator.

a. **Calculators.** Non-graphic and non-algebra calculators which do not contain memory may be used during this examination and throughout NPS. If you do not already own one of these calculators, the NEX adjacent to the NNPTC campus (NEX Student Store) has recommended models for sale. A significant number of students elect to use the TI-30 or TI-36 calculator models, as they are simple, inexpensive, and easy to use.

PRESCHOOL.

1. Preschool is a preparatory course which occurs prior to NPS class-up, and it is required for some students. This course is conducted over three weeks, includes fundamental concepts in math, physics, basic electricity, and thermodynamics, and it roughly mirrors the difficulty and pace of the first half of NPS. A final examination is conducted at the conclusion of Preschool to gauge retention and identify any areas where you may require additional focus and assistance from NPS instructors. Preschool is also a fantastic opportunity to help get back into the student mindset and to refresh study skills which have atrophied since you last attended college.

2. Depending upon class loading, extra space may be available in Preschool for early check-in students who would not have otherwise been mandatorily assigned to Preschool. Please contact the ADOD for more information on this opportunity.

3. School Supplies. Required supplies are mechanical pencils, a blue pen, a ruler, erasers, a Confidential stamp, and paper for working homework and practice problems. At least one three-ring binder, a whiteboard (typically 8''x 11'') or electronic equivalent "Boogie Board" and dry-erase markers are highly recommended. Anything else you may need is available at the NEX Student Store after you check in.

ACADEMICS.

1. NPS itself is a fast-paced, rigorous academic environment which does not lend itself to "cramming" for exams. As such, there are a few important takeaways to keep in mind:

a. Because a significant portion of the day is taken up by in-class instruction, most study occurs outside of normal working hours. Night duty instructors are made available for assistance during peak after-hours study times (typically 1700-2000).

b. Nearly all students find they must study 2-3 hours on most academic nights and for some period of time during at least one day each weekend to be successful. Some students will need to put in more time than this to meet standards. In all, the average junior officer student studies between 15-20 hours outside of class per week. Some weeks will require significantly more effort, and some will require less.

RECOMMENDED SELF-STUDY PRIOR TO NUCLEAR POWER SCHOOL.

1. In order to make your transition to NPS as seamless as possible, the following resources are provided as a refresher in the fundamentals of math, physics, and thermodynamics. While not explicitly required, a thorough review of this information is provided to assist any preparations you choose to do before arriving at NPS. Students who review these topics will be better-prepared upon arrival and typically are less prone to struggle at NPS.

2. These review resources are broken down by subject and further ordered into tiers based on the level of essentiality to review the topic prior to your arrival. Some topic links are duplicated with video examples from Khan Academy (https://www.khanacademy.org), which is a fantastic resource to follow along with after reviewing the associated text links. The purpose of the below information is not to teach you everything you need to know at Nuclear Power School, but rather to help you transition more easily into NPS by refreshing or introducing you to some fundamentals. **Give this review your best attempt, as you will see these topics again.**

Mathematics Review:

Math Priority 1 – if you have time to review nothing else at all, review these mathematics topics:

1. Basic Algebra:
http://tutorial.math.lamar.edu/Classes/Alg/Alg.aspx

2. Complex Numbers:
http://tutorial.math.lamar.edu/Extras/ComplexPrimer/ComplexNumbers.aspx

3. Exponentials and Logarithms:
http://tutorial.math.lamar.edu/Classes/Alg/ExpAndLog.aspx

4. Derivatives:
http://tutorial.math.lamar.edu/Classes/CalcI/DerivativeIntro.aspx

5. Integration:
http://tutorial.math.lamar.edu/Classes/CalcI/IntegralsIntro.aspx

6. Integration by Parts:
http://tutorial.math.lamar.edu/Classes/CalcII/IntegrationByParts.aspx

7. Pre-Calculus (video lesson):
https://www.khanacademy.org/math/precalculus

8. Differential Calculus (video lesson):
https://www.khanacademy.org/math/differential-calculus

9. Integral Calculus (video lesson):
https://www.khanacademy.org/math/integral-calculus

10. Multivariable Calculus (video lesson):
https://www.khanacademy.org/math/multivariable-calculus

Math Priority 2:

1. Vectors:
http://tutorial.math.lamar.edu/Classes/CalcII/VectorsIntro.aspx

2. Sketching Derivatives:
https://www.youtube.com/watch?v=uJC-eobULME

3. Sketching Integrals (Antiderivatives):
https://www.youtube.com/watch?v=UDbIeNhX6vE

4. Differential Equations:
http://tutorial.math.lamar.edu/Classes/DE/Separable.aspx

Physics Review: The primary resource for physics topics is HyperPhysics.

Physics Priority 1:

1. Velocity and Acceleration:
http://hyperphysics.phy-astr.gsu.edu/hbase/vel.html#velcon

2. Position:
http://hyperphysics.phy-astr.gsu.edu/hbase/posit.html#c1

3. Forces:
http://hyperphysics.phy-astr.gsu.edu/hbase/force.html

4. Newton's Laws:
http://hyperphysics.phy-astr.gsu.edu/hbase/Newt.html#ntcon

5. Work Energy and Power:
http://hyperphysics.phy-astr.gsu.edu/hbase/work.html#wep

6. Conservation Laws:
http://hyperphysics.phy-astr.gsu.edu/hbase/conser.html#cons

7. Electric Circuits:
http://hyperphysics.phy-astr.gsu.edu/hbase/electric/ecircon.html#c1

8. AP Physics 1 (video lesson):
https://www.khanacademy.org/science/ap-physics-1

AP Physics 1 is on the level of a first semester undergraduate, calculus based physics course. The topics covered in this course include kinematics, conservation laws, energy, electrostatics, and DC circuits.

9. AP Physics 2 (video lesson):
https://www.khanacademy.org/science/ap-physics-2

AP Physics 2 is on the level of a second semester undergraduate, calculus based physics course. The topics covered in this course include electrodynamics, magnetism, thermodynamics, fluids, geometric optics, and quantum physics. You can skip the section on geometric optics.

Physics Priority 2:

1. Magnetism:
http://hyperphysics.phy-astr.gsu.edu/hbase/magnetic/magfie.html#c1

2. Nuclear Physics:
http://hyperphysics.phy-astr.gsu.edu/hbase/nuccon.html#c1

Thermodynamics Review: The primary resource for thermodyamics topics is also HyperPhysics.

Thermo Priority 1:

1. Basic Plant Familiarity: Useful for putting portions of PNPS in perspective. Will be expanded greatly in the Reactor Plant Systems course during your first two weeks of NPS: http://hyperphysics.phy-astr.gsu.edu/hbase/NucEne/reactor.html#c3

2. Thermodynamics: Thermo is a problem solving course and covers many topics in the two weeks of PNPS. The topics can be more difficult to self-teach, so it is recommended to first focus on basic terminology. For each one, know the word, symbol, units (English Engineering System), and a brief physical description or definition. Get comfortable with these before moving on.

   a. Temperature:
      http://hyperphysics.phy-astr.gsu.edu/hbase/thermo/temper.html#c1

   b. Rankine Scale:
      http://hyperphysics.phy-astr.gsu.edu/hbase/thermo/temper.html#c3

   c. Internal Energy:
      http://hyperphysics.phy-astr.gsu.edu/hbase/thermo/inteng.html#c2

   d. Heat:
      http://hyperphysics.phy-astr.gsu.edu/hbase/thermo/heat.html#c1

   e. Specific Heat:
      http://hyperphysics.phy-astr.gsu.edu/hbase/thermo/spht.html#c1

   f. Work:
      http://hyperphysics.phy-astr.gsu.edu/hbase/thermo/firlaw.html#c3

   g. Enthalpy:
      http://hyperphysics.phy-astr.gsu.edu/hbase/thermo/firlaw.html#c2

   h. Entropy:
      http://hyperphysics.phy-astr.gsu.edu/hbase/thermo/seclaw.html#c4

   i. Thermal Expansion:
      http://hyperphysics.phy-astr.gsu.edu/hbase/thermo/thexp.html#c1

Thermo Priority 2: Time permitting, start looking at processes. These will get you through the first few days of Preschool and may be useful to understand applications for vocabulary terms.

a. Processes:
http://hyperphysics.phy-astr.gsu.edu/hbase/thermo/Heatengpro.html

b. Isothermal:
http://hyperphysics.phy-astr.gsu.edu/hbase/thermo/isoth.html#c1

c. Adiabatic:
http://hyperphysics.phy-astr.gsu.edu/hbase/thermo/adiab.html#c1

d. Constant Volume:
http://hyperphysics.phy-astr.gsu.edu/hbase/thermo/cvpro.html#c1

e. Phase Changes:
http://hyperphysics.phy-astr.gsu.edu/hbase/thermo/phase.html#c1

f. Thermal Equilibrium:
http://hyperphysics.phy-astr.gsu.edu/hbase/thermo/thereq.html#c1

g. Ideal Gas Law:
http://hyperphysics.phy-astr.gsu.edu/hbase/Kinetic/idegas.html#c1

h. PV Diagrams:
http://hyperphysics.phy-astr.gsu.edu/hbase/thermo/heaeng.html#c2

Thermo Priority 3: Tying the definitions and processes together for the first few topics, which will get you more than half of the PNPS material. If you get to these sections and understand them you will be well ahead of the curve.

a. 1st Law of Thermo:
http://hyperphysics.phy-astr.gsu.edu/hbase/thermo/firlaw.html#c1

b. 2nd Law of Thermo:
http://hyperphysics.phy-astr.gsu.edu/hbase/thermo/seclaw.html#c1

c. Heat Engines:
http://hyperphysics.phy-astr.gsu.edu/hbase/thermo/heaeng.html#c1

A LOOK-AHEAD TO THE NPS CURRICULUM.

Along with the previously mentioned math, physics, and thermodynamics topics, you will find resources for chemistry, radiological fundamentals, electrical engineering, and other topics on the NNPTC webpage (link below). All of these topics will be covered during your time at Nuclear Power School. There is no requirement to learn this material prior to your arrival at the command. The reference books are the Department of Energy (DOE) fundamental handbooks which cover the material expected to be known by civilian nuclear power plant operators. The difficulty level ranges from basic (i.e. algebra) to advanced (i.e. reactor dynamics).

Please note that the information and reference books provided at Nuclear Power School are classified and as such, you will not be able to find exact Nuclear Power School material online. Regardless, the problem solving skills and concepts covered in this guide are translatable and will help ease the learning curve, should you have the opportunity to review them:

https://www.navsea.navy.mil/Home/NNPTC/Power-School/StudyMaterial/

IMPORTANT NNPTC CONTACT INFORMATION.

1. Assistant Director, Officer Department (0700-1530 EST) 843-794-8115
2. NNPTC Quarterdeck (24/7) 843-794-8000
3. NNPTC Command Duty Officer (CDO) 843-834-3168