NCAS-M II -- Core NOAA Mission-Aligned Skills and Competencies (CNMSC), Activities, and Formal Assessments

Core NOAA Mission-Aligned Competencies*	Core NOAA Mission-Aligned Competencies Specific Measurable Metrics	NCAS-M II Activities	NCAS-M II Assessments
1. Ability to conduct translatable data science and social competencies to communicate impact of NOAA NWS mission services and products	Undergraduate and Graduate students are rigorously trained in NOAA mission-aligned disciplines (with relevant emphasis on NWS). Also, students are trained and graduated with interdisciplinary knowledge and competencies, especially for meteorology and atmospheric sciences; having specialized numerical weather predictions and earth systems modeling technical skills (including but not limited to: Unified Forecast System, cloud-based computing); completing hands-on/experiential application of translatable data science applied to Artificial Intelligence (AI) and machine learning (ML). **NCAS-M II students are trained to:** 1. Describe NOAA's general mission and the NWS mission. 2. Conduct translatable data science to communicate the impact of NOAA NWS mission services and products. 3. Have the social competences to effectively communicate the impact of NOAA NWS mission services and products.	1. Orientation meetings – review of NOAA's and NWS's mission. 2. Participation in NOAA mission-relevant research 3. NOAA Experiential Research and Training Opportunities (NERTO) and NOAA Experiential Training Summer Internship (NETSI) experiences – interactions with NOAA research and operations personnel 4. Presentation at professional conferences 5. NOAA related field-campaigns. 6. NOAA mission-aligned technical/skill development workshops 7. Center-wide professional development workshops 8. Monthly webinars 9. Interdisciplinary student research series presentations	• NOAA Experiential Research and Training Opportunities (NERTO) and NOAA Experiential Training Summer Internship (NETSI) reports and presentations (*reviewed by NOAA Mentors, NCAS-M II Faculty Advisors, Distinguished Scientist (DS), & Education Expert (EE)*) • Oral presentations (*reviewed by NCAS-M II faculty advisors*) • Poster presentations (*reviewed by NCAS-M II Faculty Advisors*) • Publications (*work in coordination with NCAS-M II Faculty Advisors and other co-authors*) • Webinar Pre-/Post-Tests • Webinar Evaluations/Polls • Templates for Research Series presentations (*presentations reviewed by DS*) • Completion of NOAA Skills and Competencies Training at NCAS-M II with formal assessments
2. Ability to experience and conduct R&D projects from end-to-end	Undergraduate and Graduate students regardless of major, complete core coursework in statistical analysis, at least one programming language (C, C++, R, Python, FORTRAN (to transition to new platforms), computer engineering and	1. Course work related to data analysis and/or modeling 2. Engage in NOAA mission-aligned research (for theses/dissertation)	• Successful completion of thesis/dissertation • NERTO and NETSI reports and presentations (*reviewed by the NOAA Mentors,*

	applications, including social sciences. Students can also describe data analysis and/or modeling method(s) used in their research, and complete discipline specific data science courses, assignments, and projects. **Undergraduates:** Understand, experience, and apply data analysis and/or modeling techniques to research projects and conduct R& D projects from end-to-end. **Graduates:** Understand, experience, and apply data analysis and/or modeling techniques to research projects (including thesis and dissertation research) and conduct R& D projects from end-to-end.	and R&D projects from end-to-end 3. NERTO and NETSI experiences – engagement in NOAA mission aligned research 4. Involvement in NOAA related field campaigns 5. NOAA mission-aligned technical/skill and competencies trainings 6. Technical skills training at Center-wide core competency workshop	*NCAS-M II Faculty Advisors, DS, & EE*) • Technical skills training evaluation with feedback from NOAA mentors • Satisfactory completion of observation and quantitative data analysis courses with formal assessments • Completion of NOAA Skills and Competencies Training at NCAS-M II with formal assessments
3. Ability to identify, prepare, analyze, interpret, and convey the impacts to decision makers and the public	Undergraduate and Gradaute students are trained to have a technical understanding and interdisciplinary knowledge and can identify, prepare, analyze, interpret, and communicate the impacts of their research to decision makers and the public. They can also discuss how NOAA products and services are interpreted and communicated; and demonstrate the skills through prior experience(s) to join the NOAA mission enterprise as meteorologists or hydrologists to meet the needs of a wide cross section of the Nation **Undergraduates:** Perform oral and written science communication tasks such as poster/oral presentations (e.g., AMS, ETSP Research Colloquium), scientific writing (e.g., essay, academic papers), and engage in scientific discussions/meetings. **Graduates:** Perform oral and written science	1. Participate in NOAA mission-aligned research 2. NERTO and NETSI experiences – engagement in NOAA mission aligned research 3. Presentations at professional conferences and NOAA meetings (e.g., One NOAA Science Seminar and NOAA Office of Education Undergraduate Symposium) 5. NOAA mission-aligned technical/skill and competencies trainings 6. Center-wide core competency workshops 7. Interdisciplinary student research series presentations 8. Completion of publication manuscripts	• NERTO and NETSI reports and presentations (*reviewed by the NOAA Mentors, NCAS-M II Faculty Advisors, DS, & EE*) • Oral presentations (*revie wed by NCAS-M II faculty advisors*) • Poster presentations (*re viewed by NCAS-M II Faculty Advisors*) • NCAS-M II Interdisciplinary Research Series presentations (*presentations reviewed by DS*) Publications (*work in coordination with NCAS-M II Faculty Advisors & other co-authors*) • Completion of NOAA Skills and Competencies Training at NCAS-M II with formal assessments • NOAA Science Seminar (graduate students) presentations and NOAA OEd UG

	communications tasks such as oral/poster presentations (e.g., AGU, AMS, NCAS-M II Research Focus Groups, NOAA EPP/MSI Biennial Science and Education Forum), scientific writing (e.g., theses, dissertations, publications), and engage in scientific discussions/ meetings.		Research Symposium (UG students) presentations (*presentations reviewed by NCAS-M II Faculty Advisor, NOAA Mentor, DS, & EE*)

*Key

Level of Competence for each CNMSC

1=Awareness

2=Understanding of fundamentals and some initial practical application

3=solid conceptual understanding and some practical application

4=significant conceptual knowledge and practical experience in performing a competency to a consistently high standard

5=extensive knowledge, refined skill, and prolonged experience (minimum of 3 years) in performing the defined competency at the highest standard

Consistent with the requirements of FY22 RFA and the three NCAS-M II core NOAA mission-aligned skills and competencies, students will demonstrate that they are:

a. Well trained in their disciplines, oriented toward NOAA mission-aligned fields (with relevant emphasis on NWS), and able to conduct translatable data science and social competencies to communicate the impact of NOAA NWS mission services and products;
b. Exposed to appropriate experiences to conduct research and development (R&D) projects from end-to-end; and
c. Trained to identify, prepare, analyze, interpret, and communicate the impacts of their research to decision makers and the public.