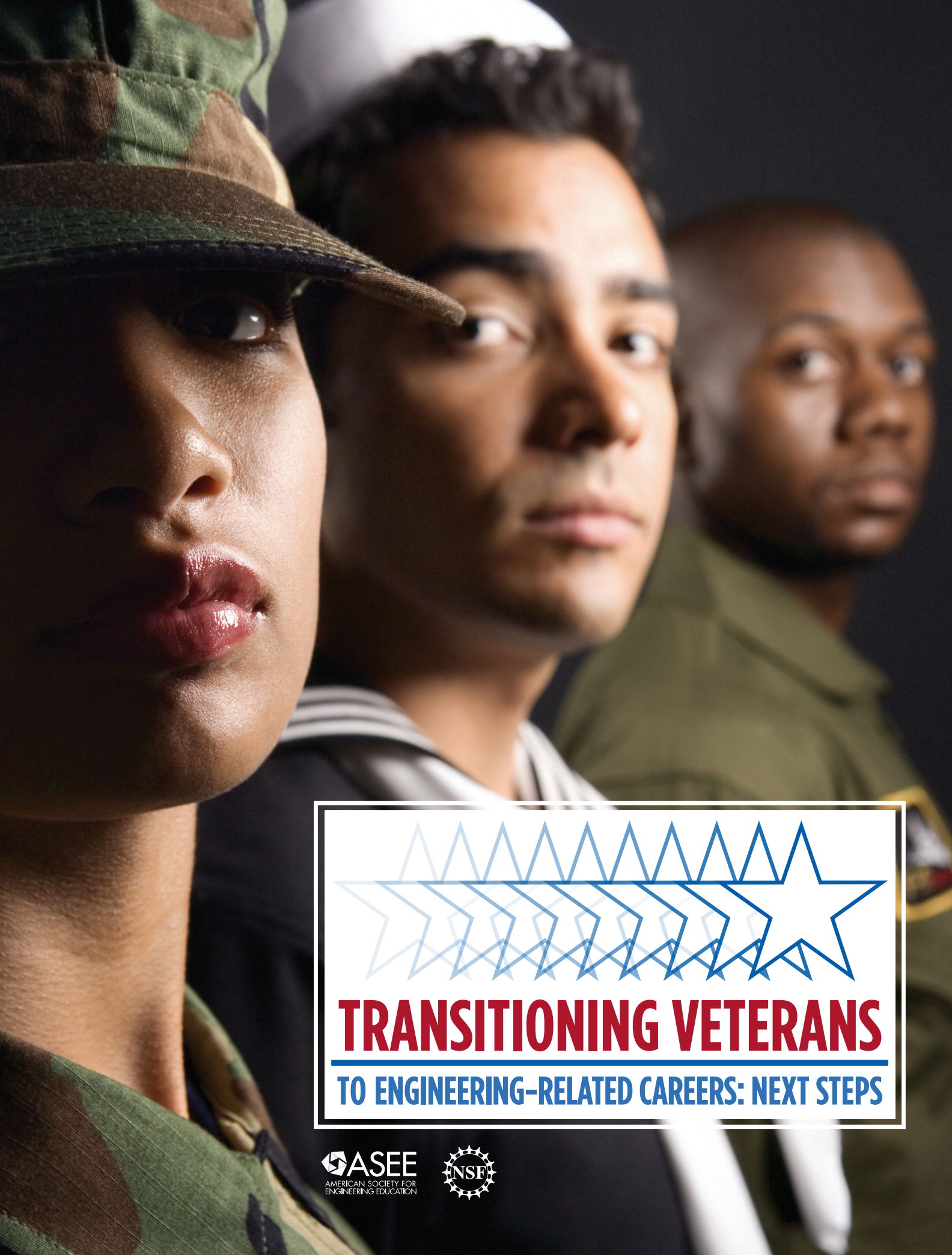

TRANSITIONING VETERANS

TO ENGINEERING-RELATED CAREERS: NEXT STEPS

ASEE
AMERICAN SOCIETY FOR ENGINEERING EDUCATION

NSF

TRANSITIONING VETERANS TO ENGINEERING-RELATED CAREERS: NEXT STEPS

WASHINGTON, D.C.

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ASEE seeks to more fully engage with high school students, parents, teachers, engineering faculty and business leaders to enhance the engineering workforce of the nation.

ASEE is the only professional society addressing opportunities and challenges spanning all engineering disciplines, working across the breath of academic education, research, and public service.

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- We support engineering education across institutions, by identifying opportunities to share proven and promising practices.
- We support engineering education locally, regionally, and nationally, by forging and reinforcing connection between academic engineering and business, industry, and government.

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Transitioning Veterans to Engineering-Related Careers: Next Steps

American Society for Engineering Education
1818 N Street NW, Suite 600
Washington, DC 20036

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ASEE PROJECT STAFF

Norman L. Fortenberry
Executive Director

Ashok K. Agrawal
Managing Director, Professional Services

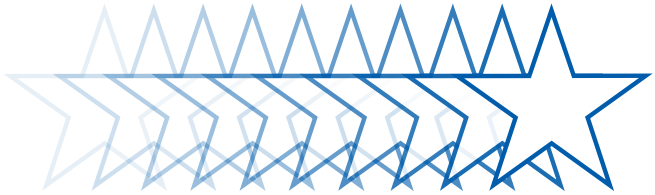
Rocio C. Chavela Guerra
Manager, Faculty Development

William E. Kelly
Director, External Affairs

ASEE PUBLICATION STAFF

Mark Matthews
Director/Editor, Editorial

Francis Igot
Junior Graphic Designer, Art & Production



TRANSITIONING VETERANS

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BACKGROUND

With the draw-down of the wars in Iraq and Afghanistan, a large cohort of military veterans will take advantage of the Post-9/11 GI Bill for collegiate education. The National Science Foundation (NSF) has recognized for several years that veterans can augment the Science, Technology, Engineering, and Mathematics (STEM) workforce in the United States and is exploring ways to engage returning veterans in these fields. Assisting veterans to find pathways to careers as engineering technicians, engineering technologists, or engineers (ETETE) can have society-wide impacts.

In 2013 and 2014 the American Society for Engineering Education (ASEE) hosted two Summits with this goal in mind. Attendees included representatives from two- and four-year institutions, professional organizations, and federal agencies. The general consensus among participants was that pathways to ETETE careers can be most effectively implemented through:

- early awareness of ETETE careers
- academic recognition of service members' prior experience
- partnerships among 2-year and 4-year institutions
- effective articulation among the partnering institutions
- effective guidance and counseling, from both the military and academe

TRANSITION SUMMIT I

In October 2012, the National Science Foundation (NSF) awarded Project EEC-1262094 to ASEE to host a one-day Summit of 60 academic, professional organization, and federal agency leaders to begin the conversation with the long-term goal of transitioning veterans and active duty military personnel to civilian careers in ETETE through academic programs. The desired outcome of this Summit was to reach agreement on realistic steps necessary to facilitate this transition around four tasks:

1. Build early awareness of ETETE careers and the pathways that lead to them.
2. Ensure academic recognition of service members' prior experience.
3. Define and propagate supportive academic environments.
4. Provide seamless support from government agencies, academic institutions, and industry.

Participants agreed that veterans' most practical and expedited path to graduation is likely to be an Associate of Applied Science (AAS) degree in engineering technology. Because across all veterans there is diversity in technical background, experience, and academic preparation, it is logical to provide them with a degree easily understood by the market place but that provides them the flexibility to tailor their degree to their background. In addition, this helps eliminate the challenge veterans may have in identifying colleges that will grant credit for their prior experience. Discussion gave rise to the idea of a national portal and a national program that serves all veterans in a consistent and seamless way, walks them through the college academic system, and facilitates their degree-earning process. The summit participants recognized that there is no one-size-fits-all approach to encouraging returning veterans in ETETE. However, they made a number of recommendations to advance NSF's vision of transitioning veterans to engineering-related careers. Some of the recommendations from this summit include:

- Introduce service members to ETETE opportunities as early as possible.
- Develop a national information network for self-development.
- Build local consortia that draw together industry, colleges and universities, and the military.
- Disseminate information in a format veterans can easily understand.
- Detail links between ETETE skills and military occupational specialties, and help educational institutions understand how military experience correlates to academic credit.
- Encourage co-ops, internships, and research experiences that align skills with careers.
- Offer more math and science courses on military bases, and foster early academic preparation through alternatives such as massive open online courses (MOOCs).
- Create a national registry of campus offices of veterans' services.
- Ensure military training officers are aware of ETETE degree requirements.
- Encourage those in ETETE-related military specialties to pursue ETETE degree.
- Improve the tracking of veterans' education.

TRANSITION SUMMIT II

In its continued effort to advance this agenda, NSF asked ASEE to convene a group of two- and four-year colleges to work on developing a seamless career pathway for transitioning veterans to ETETE careers and a framework for transferability from two- to four-year programs. In recognition of the role American Council on Education (ACE) plays in certifying credit equivalency for military training and experience, ACE was invited to share its credit equivalency approval process and logistics on awarding such credits. Colleges and universities at the summit all have at least one ABET-accredited engineering and/or engineering technology program, have a military base in close proximity to their campus, and have some formal transferability agreement with a neighboring two- or four-year institution. Expected summit outcomes were:

- a highlighting of successful partnerships among 2-year and 4-year degree granting institutions that support veterans' transition to ETETE,
- development of a preliminary framework, including effective articulation and advising documents, for efficient transition of veterans to ETETE,
- and a commitment from attendees to advocate for the adoption of the proposed framework at their institutions and in their states.

CAREER PATHWAYS FOR VETERANS TRANSITIONING TO ENGINEERING-RELATED CAREERS

In the months leading up to the summit, ASEE produced and circulated a short concept paper (see Appendix) for a national program that would simplify and standardize veterans' pathways to a general engineering technology associate's degree offered by a consortium of authorized colleges. In addition, ASEE developed a *Career Pathways* flowchart, "Engineering Career Pathways for Veterans and Active Duty Personnel" (Figure 1).

The *Career Pathways* provides multiple options for individuals to earn credits for both general education courses and technical courses required as part of a two-year degree. Credits earned during this time can be combined with both credit from prior experience and credit granted through processes such as American Council on Education equivalency. In addition to providing opportunities to enter the workforce while earning an Associate's degree – depending on one's field and specialty of study – earning technical credits can lead to one or more industry-recognized certifications. The *Career Pathways* describes these certificates as "stackable certificates," which could constitute the bulk of technical courses needed for an engineering technology degree.

Recognizing the technical and supervisory experience gained by veterans and active duty personnel during their military careers, the *Career Pathways* is designed to provide opportunities for formal degree and subsequent careers in engineering, engineering technology, or management / supervision. However, the *Career Pathways* does not end there; some individuals upon completing a baccalaureate degree may also want to pursue graduate education. The *Career Pathways* provides for this as well, either immediately after completing the bachelor's degree or while working in industry and business. Many universities offer part-time graduate education opportunities for working adults.

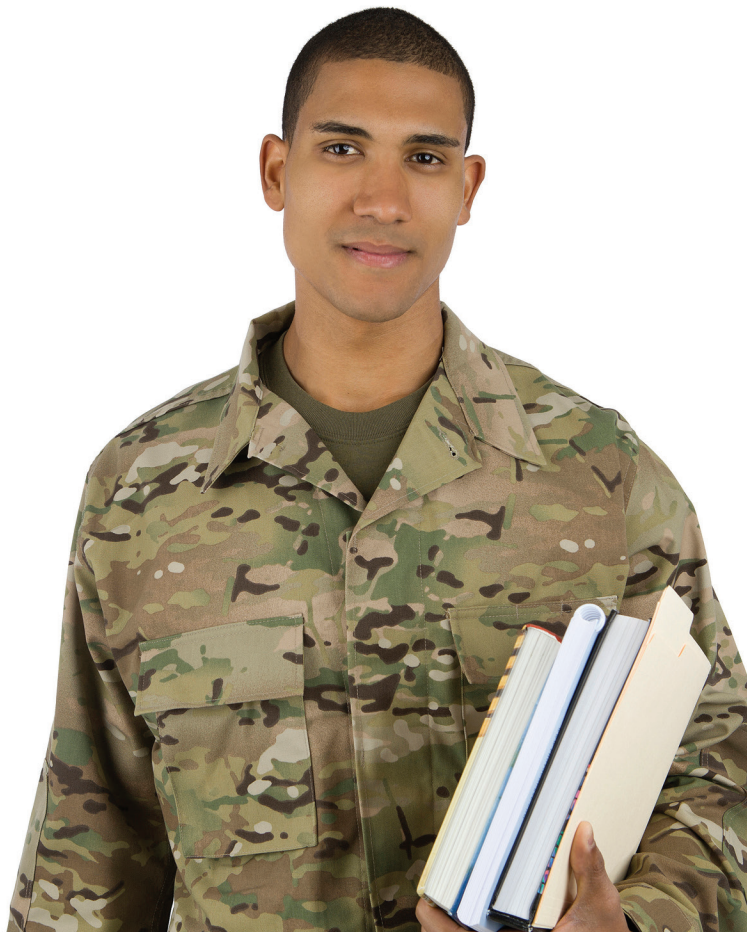
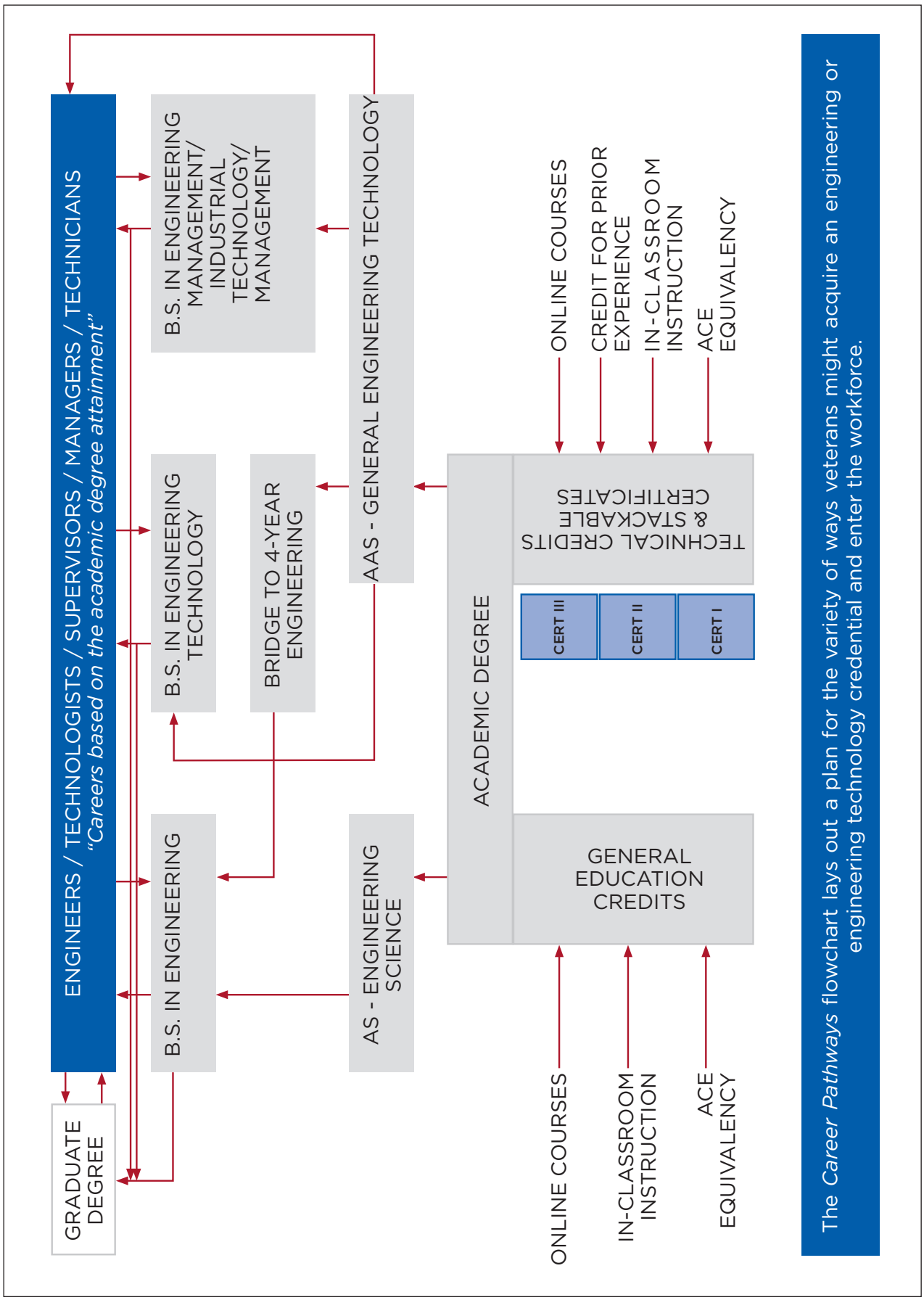


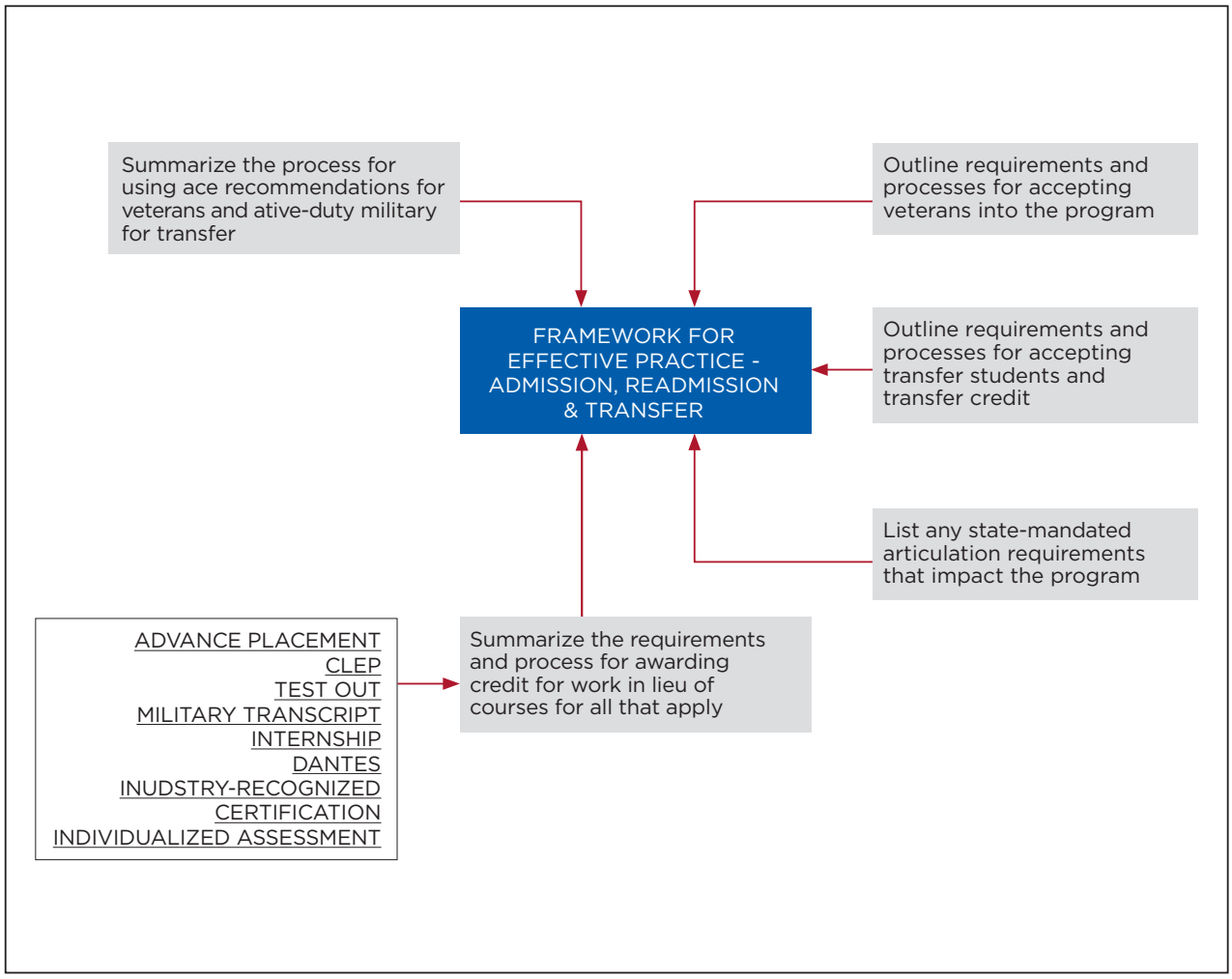
Figure 1. Engineering Career Pathways for Veterans / Active Duty Personnel



IMPEDIMENTS TO SMOOTH TRANSITION

The institutions examined impediments to a smooth transition from active duty to college and from two-year to four-year programs; skill gaps common among servicemen and women; how to count military training and experience toward academic credit; and ways that institutions could become more veteran-friendly. Among key ideas requiring action by multiple institutions and/or government were: forming consortia of two-year and four-year colleges to compile best practices and share data; transfers both within and between states; common articulation mechanisms and standards; advisory panels comprising representatives of academic institutions, the military, and industry; an online offering of engineering requirements that could be fulfilled while on active duty; and closer involvement of ABET accreditors in veterans' engineering education. Despite the relative affordability of community colleges, however, cost remains a potential obstacle. Many veterans simply may not have a sufficient academic background to complete an engineering degree within the 36 months of GI Bill payments. Figure 2 represents a possible framework for effective implementation of many steps involved in transitioning veterans and active duty military personnel to educational institutions for credentialing and degree attainment.

Figure 2. Framework of Effective Admission, Readmission and Transfer Practices for Transitioning Veterans Among Two- and Four- Year Colleges



INSTITUTIONAL COMMITMENT TO SUPPORT TRANSITION

Steps within institutions that attendees generally considered important, if not essential, included:

- support from senior administrators;
- improved services and advising, begun before a veteran arrives on campus and sustained with designated staff;
- efforts, including training if needed, to increase faculty awareness of and sensitivity to veterans' needs;
- clearly defined pathways to degrees, certifications, and careers;
- "bridge" programs to bolster math and science skills;
- improved, consistent methods for assessing and granting credit for prior learning.

NEXT STEPS

There seemed to be broad agreement among the participating colleges that "tremendous potential" exists for schools to collaborate in adopting best practices in implementation of *Career Pathways* and transferability. They suggested that consortia be formed, guided by advisory committees, that would look at academic programs and house the all-important data. Along with agreements among institutions, employers, and government, it would be helpful to have a set of national courses acceptable to consortia. It was suggested that ASEE and ACE could convene academic leaders to suggest best practices and issue a national statement that declares: "We're committed; here's what needs to be done."

Written "Next Steps" submitted by participants offered a number of concrete ideas for institutions to pursue individually or collectively:

- A 6-month to 1-year process of engaging the military; educating faculty through the Faculty Senate; and involving registration software developers and ACE in better data tracking.
- A guide as to what data should be tracked, as well as a clearing house for data and a repository for best practices (6 months to 1 year).
- A training vehicle for faculty and administrators (6 months to 1 year).
- Pending states' approval, all institutions represented at the Summit could enter into transfer partnerships, ideally by the summer or fall of 2015.
- Form regional consortia by the spring of 2015.
- College partnerships advertise steps being taken to assist veterans.
- Develop relationships with other colleges and universities for ensuring pathways for industry-certified technicians.
- Develop a set of credit-for-prior-learning best practices that colleges and universities can adopt.
- Develop model articulation/transfer agreements for engineering technology and engineering. Assign credit hour values to certain military training & industry certification develop agreement that cooperating colleges and universities can sign.

Based on the presence of military bases, existence of statewide system for course equivalencies, and strong and formalized transfer partnerships among two- and four-year institutions, California, Florida, Missouri, New York, North Carolina, Texas, and Virginia were identified as possible states that should consider implementing *Career Pathways* and Transition model discussed at the Summit. Consortia of two- and four-year institutions, military services, and employers at these states should be encouraged to develop plans and systems to provide information on educational and employment opportunities leading to engineering and engineering related career opportunities for veterans and active duty military personnel.

APPENDIX: AAS ENGINEERING TECHNOLOGY DEGREE

FAST-TRACKING VETERANS TO AAS DEGREE IN ENGINEERING TECHNOLOGY

With the draw-down of the wars in Iraq and Afghanistan, a large cohort of military veterans will be seeking to take advantage of the Post-9/11 GI Bill for collegiate education in preparation of (re)entry into the workforce. For many of the enlisted veterans, their most practical and expedited path to earning college credentials and a degree is likely to be an AAS degree in engineering technology. Veterans are likely to have very diverse technical background, experience and academic preparation. Therefore in order to maximize on their past experiences, academic preparation, interest and employment potential, it would seem logical to provide all veterans with a degree that is easily understood by all in the market place but still provides them the flexibility to tailor their degree requirement to match their background.

There would be great value in helping veterans to avoid the frustrations of identifying colleges that will accept their credentials. We envision a national portal and a national program that serves all veterans in a consistent and seamless way, walks them through the process to college academic system, and facilitates their degree earning process. We also see value in concurrently developing a program in General Engineering Technology which is offered by one or a consortium of colleges. The requirements and structure for such a program could to be similar at all colleges.

The program of study for this program should be such that veterans can either tailor the technical component of the program to meet their future career and occupational needs and/or earn credits for their past experiences. Technical core credits for such a program may be earned by a combination of technical course work, formal technical training while in military and on-the-job experience, and nationally and/or regionally approved certifications.

STEPS NECESSARY TO FACILITATE VETERANS EARNING AN AAS DEGREE IN GENERAL ENGINEERING TECHNOLOGY

- Transitioning military and veterans should be made aware of the multiple educational pathways and careers in engineering technology/engineering fields and industry-recognized certifications. Ideally this should happen during transition programs in each of the services.
- Transitioning military and veterans need to be provided concise, correct and comprehensive information on how their military MOS programs can lead to earning college credentials and subsequently an engineering/engineering technology or related Associates and/or Bachelor's degree.
- A national organization with a focus on engineering/engineering technology education should be established to assist the veteran population in maneuvering through the maze of higher education institutions and industry certifications.
- A consortium of colleges should be established that will develop a pilot for a nationally recognized AAS degree program in General Engineering Technology that can be accredited by ABET, the nationally recognized accrediting agency for engineering and engineering technology programs, at a future time. The consortium colleges will become the authorized credentialing and degree-granting institutions for this veteran-focused AAS degree program in General Engineering Technology.
- Organizations focused on the roles of community colleges in engineering and engineering technology should be collaborators in this activity.
- An industry advisory council should be established to provide input on industry-recognized certifications and credentials.
- The national organization should be the focal point for the academic record keeping and advising for military personnel while they are on active duty and are engaged in academic activities to ensure that their academic work is in congruence with their career aspirations upon separating from the military.
- Ongoing and timely communication will help active-duty personnel earn a college credential on an expedited schedule upon leaving the military. In some cases, active advising and guidance could facilitate earning a two-year degree in as little as 12 or 15 months.
- The national organization should work with the consortium colleges, organizations such as the American Council on Education, and credentialing agencies to analyze how a veteran's active-duty experience and training can be applied toward college credit.
- Working in collaboration with consortium colleges, the national organization should identify and select a cadre of engineering technology faculty from ABET-accredited engineering technology programs who will review the credentials and experiences of veterans to determine the number of credit hours a veteran could earn from a partnering ABET-accredited engineering technology program towards an AAS degree.
- The national organization should function as the clearing house and repository of student veterans' information, including academic records and credit hours, to facilitate their progress in earning degrees, diplomas, and other industry-recognized credentials from consortium colleges.

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