

---

# Some aspects of mathematical training of engineers

© E.A. Vlasova, E.P. Kazandzhan, V.S. Popov

Bauman Moscow State Technical University, Moscow, 105005, Russia

*The article deals with the problems of future engineers' mathematical training and culture development. It shows the importance of such training for students' professional activities. We consider engineers' general cultural, social, personal and professional competences, which are formed while learning mathematics in a technical college. The article demonstrates the relationship between fundamental and applied mathematics. It also discusses some features of teaching mathematics at engineering universities. We argue that engineers' knowledge should comprise special professional activities, the relevant level of mathematical knowledge, the ability to use mathematical and numerical methods, mathematical packages, and modern interactive computer systems in engineering calculations.*

**Keywords:** engineering mathematics, engineering competence, mathematical culture, mathematical reasoning, mathematical modeling, interdisciplinary communication

## REFERENCES

- [1] Kon E.L., Freyman V.I., Yuzhakov A.A. *Nauka i obrazovanie: nauchnoe izdanie — Science and Education: Scientific Edition*, 2015, no. 3. Available at: <http://technomag.bmstu.ru/doc/761419.html>
- [2] Sigorskiy V.P. *Matematicheskiy apparat inzhenera* [Mathematical apparatus of engineer]. Kiev, Tekhnika Publ., 1975, 768 p.
- [3] Kazandzhan E.P. *Shkolnik — abiturient — student — inzhener*. Uchebnoe posobie [The student — applicant — student — engineer. Training guide]. Moscow, BMSTU Publ., 2013, 132 p.
- [4] Myshkis A.D. *Matematika v vysshem obrazovanii — Mathematics in Higher Education*, 2003, no. 1, pp. 37–52.
- [5] Knyazeva O.G. *Vestnik Tomskogo gosudarstvennogo pedagogicheskogo universiteta — Tomsk State Pedagogical University Bulletin*, 2009, no. 9, pp. 14–18.
- [6] Panov V.F. *Matematika drevnyaya i yunaya* [Ancient and young mathematics]. Moscow, BMSTU Publ., 2004, 656 p.
- [7] Kudryavtsev L.D. *Sovremennaya matematika i ee prepodavanie. Izbrannye trudy. Tom 3.* [Modern mathematics and its teaching. Selected works. Vol. 3]. Moscow, Fizmatlit Publ., 2008, pp. 16–169.
- [8] Vlasova E.A., Novogilova O.V. *Inzhenernyy zhurnal: nauka i innovatsii — Engineering Journal: Science and Innovation*, 2013, iss. 3 (16). Available at: <http://engjournal.ru/catalog/pedagogika/hidden/678.html>
- [9] Zimina O.V. *Vestnik MGU. Ser.20 — Moscow University Bulletin. Educational Studies*, 2005, no. 1, pp. 17–66.
- [10] Vlasova E.A., Popov V.S., Pugachev O.V. *Vestnik Moskovskogo gosudarstvennogo oblastnogo universiteta. Ser.: Fizika-matematika — Bulletin MSRU. Series: Physics and Mathematics*, 2016, no. 3, pp. 120–132.
- [11] Vlasova E.A., Gribov A.F., Popov V.S., Latyshev A.V. *Vestnik Moskovskogo gosudarstvennogo oblastnogo universiteta. Ser.: Fizika-matematika — Bulletin MSRU. Series: Physics and Mathematics*, 2013, no. 3, pp. 93–99.

- 
- [12] *Konseptsiya razvitiya matematicheskogo obrazovaniya v Rossiyskoy Federatsii*  
[The concept of mathematical education development in the Russian Federation].  
Available at: <http://минобрнауки.рф/документы/3894/файл/2730/Концепция>

**Vlasova E.A.**, Cand. Sc. (Phys.-Math.), Assoc. Professor, Department of Applied Mathematics, Bauman Moscow State Technical University. Research interests: linear algebra, functional analysis, methods of teaching mathematics, issues of educational quality.  
e-mail: elena.a.vlasova@yandex.ru

**Kazandzhan E.P.**, Cand. Sc. (Eng.), Assoc. Professor, Department of Applied Mathematics, Bauman Moscow State Technical University. Research interests: mathematical analysis, integral calculus, differential equations, methods of teaching mathematics, issues of educational quality.

**Popov V.S.**, Cand. Sc. (Phys.-Math.), Assoc. Professor, Department of Applied Mathematics, Bauman Moscow State Technical University. Research interests: linear algebra, functional analysis, continuum mechanics, methods of teaching mathematics, issues of educational quality. e-mail: vspopov@bk.ru