Partitions, q-series, and quasimodular forms

代数学IV / Algebra IV　(0616800)
代数学概論IV / Introduction to Algebra IV　(3211006)
Nagoya University, Fall 2026

Homepage for this course: https://www.henrikbachmann.com/qser_2026.html.

- **Contact**
  Henrik Bachmann, Room 457 (Math. Building). Email: henrik.bachmann@math.nagoya-u.ac.jp. Feel free to ask questions.

- **Lecture notes**
  I will provide lecture notes which will be updated during the semester. Please check the homepage regularly for the notes and other course information. If you find any typos or have suggestions, please let me know.

- **Lectures**
  Thursday, 1st period (8:45–10:30), 多109 (Math. Building). We will have 13 lectures on 10/08, 10/15, 10/22, 10/29, 11/05, 11/12, 11/19, 11/26, 12/03, 12/10, 12/17, 01/14, and 01/21, followed by a short written exam on **28 January 2027**. January dates refer to 2027. There is no lecture on 24 December (Christmas), 31 December (winter vacation), or 7 January (Monday classes are held on this day). We will not meet on 4 February.

- **Grading & exercises**
  Grading will be based on three homework sheets (60%) and a short written exam (40%). The first homework sheet will be available through TACT on **15 October 2026**. Please submit your solutions through TACT and check the announcements for deadlines. The exam on 28 January is planned for 60 minutes and will cover definitions, examples, and short arguments from the lectures. Details on the exam and permitted materials will be announced through TACT.

  試験問題は英語と日本語の両方で用意します。

  宿題の解答は英語または日本語で提出できます。

- **Literature**
  The lecture notes are the main course material. We will use selected sections of the references below. No textbook is required.

References

[A] G. E. Andrews: *The Theory of Partitions*, 1976 (Cambridge reprints).

[Ap] T. M. Apostol: *Modular Functions and Dirichlet Series in Number Theory*, 2nd edition, Graduate Texts in Mathematics 41, Springer, 1990.

[B] H. Bachmann: *Multiple Zeta Values*, lecture notes, 2026, arXiv:2608.02230.

[BK] H. Bachmann, U. Kühn: *The algebra of generating functions for multiple divisor sums and applications to multiple zeta values*, Ramanujan J. **40** (2016), 605–648.

[EZ] M. Eichler, D. Zagier: *The Theory of Jacobi Forms*, Progress in Mathematics 55, Birkhäuser, 1985.

[Z1] D. Zagier: *Elliptic modular forms and their applications*, in *The 1-2-3 of Modular Forms*, Universitext, Springer, 2008, 1–103.

[Z2] D. Zagier: *Partitions, quasimodular forms, and the Bloch–Okounkov theorem*, Ramanujan J. **41** (2016), 345–368.