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As part of our NSF-funded initiative in Biomathematics, we are teaching a molecular biology course for computer scientists and mathematicians called "DNA Chemistry for Mathematicians". The course is designed to a) empower math and computer science students to do wet chemistry and to b) enhance students' understanding of DNA-related mathematics applications such as biomolecular computing. Designed for students with little biology or chemistry background, the course integrates bench laboratory work with classroom lectures. Lecture topics include molecular principles, weak interactions, DNA and RNA structure, basic genetics, the DNA code, biochemical techniques such as PCR, gel electrophoresis, cloning and sequencing, bioinformatics, DNA computing and the role of DNA in neuroscience. The laboratory part of the course includes DNA extraction, PCR, gel electrophoresis, cloning of a gene into bacteria, and using bioinformatics tools such as BLAST. (Received September 26, 2006)