

# Introduction to quantum electrodynamics

## 135.045 - (VO 2,0) 2015S

### Homework #02 (Mar 16, 2015)

- 2.1 Show that the Clifford algebra relation (2.12) follows from (2.7)  $\sim$  (2.9).
- 2.2 Show that  $\gamma^\mu$  are traceless.
- 2.3 Construct  $\gamma_p^0$  and  $\gamma_p^1$  in the "personal" representation obtained from the Dirac representation by  $\gamma_p^\mu = U\gamma^\mu U^{-1}$  using the matrix  $U = ((\sigma^m, 0), (0, \sigma^n))$ .  
 $n \dots$  last digit of Matrikel-No. mod 3 ( $0 \equiv 3$ )  
 $m \dots$  last but one digit of Matrikel-No. mod 3  
e.g. Matr. No. 1234567  $\rightarrow n=7 \equiv 1 \pmod{3}$ ;  $m=6 \equiv 3 \pmod{3} \rightarrow U = ((\sigma^3, 0), (0, \sigma^1))$ .  
Check the properties i)  $\sim$  iii) on p5 for these two  $\gamma$ -matrices.