Intro

① Be familiar with particles in Tables in inside Cover of Griffiths. (Tables will be supplied in Exam.)

know 3 generations of quarks and leptons!

② Be able to do special relativity problems using 4-vectors.

[i.e. threshold energy calc. etc]

③ Understand simple Feynman diagrams. for strong, E+M, weak int.

④ Be familiar with quark model multiplets. (mesons (nonet), baryons (octet, decuplet))

Conservation Laws

① Understand correspondence between symmetries and conservation Laws [Noether's Theorem]

② Know which conservation laws apply to each interaction.

③ Know how to add ang. mom. and
   do Clebsch - Gordon decomposition.

④ Know effect of Parity and C transformation
   on quarks and therefore on hadrons.
   $$\left[i.e. \quad P_\ell \,|meson\rangle = (-1)^{\ell+1} \right]$$ Also for
                                                        photon.

⑤ Know how to apply G parity to
   determine which multi-pion decay
   modes are allowed in strong int.

⑥ Know how to use isospin to
   predict cross section ratios.

⑦ Know consequences of parity violation
   in weak decay $\left[i.e. \quad r_L , \overline{r}_R \right]$

⑧ Understand CP violation and
   $K^0 - \overline{K}^0$ mixing.
   ie $|K_S\rangle \overset{?}{=} |K_1\rangle = \frac{1}{\sqrt{2}} \left[|K^0\rangle - |\overline{K}^0\rangle \right]$
   $|K_L\rangle \overset{?}{=} |K_2\rangle = \frac{1}{\sqrt{2}} \left[|K^0\rangle + |\overline{K}^0\rangle \right]$

⑨ Understand K_S regeneration.