Index

adjusted Error AB mean square 254
adjusting means for the covariate 243, 253, 256
analysis of variance world record 147
analysis of variance, ANOVA 10
ANCOVA 241, 244, 245, 248, 251, 252, 255, 256
ANOVA 11, 40, 49, 73, 99, 135, 136, 171, 189, 217
appropriate error term 26
appropriate model 88
augmented experiment design 113, 169, 188
augmented incomplete block design 180
augmented Latin square design 169
augmented Latin square or rectangle design 180
augmented lattice square design 169, 180
augmented randomized complete block design 170, 171, 180, 189, 191, 193, 194
augmented split block design 113, 169, 180, 188, 194
augmented split plot design 169, 180
augmented split split plot design 176, 180
augmented treatment 169, 189
axiom 114
balanced block 100
balanced block arrangement 76
Behrens-Fisher 215
biological clock 43, 81
blocking 2, 6, 197, 240
Bonferroni procedure 24
calendar clock 43, 78, 80, 81
carryover effect 29
check treatment 169, 171, 179, 194
checks 1
coefficient of variation 86, 88
competition 130
completely randomized design 4
complexly designed experiment 120, 135, 137, 147
component of variance 80
computer code 54, 170, 174, 180, 205
computer program 17, 240
conduct of an experiment 3, 137
confounding 6, 11, 49, 62, 76, 77, 88, 90, 98, 108, 125, 136, 153, 155
continuing effect 29
contrast 17, 88, 153, 155, 162, 173, 192
control treatment 111, 189, 191
criss-cross design 39
crossover design 29
cross-products 241, 245, 246, 252

damaged experimental unit 202
degrees of freedom 13, 45, 49, 65, 203, 243, 244, 259
design of the experiment 1, 137
direct effect 29
Dunnett’s test 24, 25, 53
effective error variance 28
Error A 12, 44, 66, 91, 203
Error AB 44
Error B 12, 27, 44, 66, 67, 107, 214
Error C 67
error mean square 110, 111, 133, 218
error term 99, 108, 109, 138, 190, 193, 203
error terms 104, 122, 125, 127, 129, 135, 147, 155, 162, 191, 241
error variances 255
estimability 122
expected value 252, 259
expected value for factor B mean square 67
expected value of mean squares 13, 43, 44, 66
experiment design, definition 1
experimental unit 4
experimental unit, definition 2
experiment-wise error rate 24
exploratory model selection 3, 62
extraneous variation 260

factorial, definition 1
factorial design 39, 73, 90, 108, 109, 110
field design of the experiment 147 et seq.
fixed effect 9, 13, 14, 54, 64, 66, 67, 170, 173, 174, 216, 259
fractional factorial 91
fractional replicate, definition 1
F-statistics 17, 204, 216, 218, 241
F-test 3, 12, 44, 50, 51, 66, 67, 76, 105, 129, 132, 179, 203, 205, 218
F-values 47, 194

GENDEX 1
GENSTAT 239
geometrical components of an interaction 110

gradients 170

greater mean square rule 86
group of experiments 219
Guinness Worlds Records 147

half normal probability plot 133
honestly significant difference 24, 53

incomplete block design 4, 61, 74, 75, 98, 105, 107, 113, 189, 190
interaction 18, 22, 27, 44, 48, 89, 110, 192
interaction of treatment with covariate 240
intercropping 7, 188, 193, 197
inter-plot competition 170, 180
intraplot error 107, 190

key-out of degrees of freedom 109, 110, 123, 135, 137

Latin square design 4, 9, 47, 77, 97, 98, 100, 102, 104, 123, 124, 125, 153
least significant difference 52
linear model 9, 67, 99, 101, 121, 125, 128, 170, 190, 192, 214, 217, 251, 255, 256
linear model for split split plot experiment design 63
linear response model for the standard split plot experiment design 9
local control 2
log transformation 86

means adjusted for the covariate 249
measure of the efficiency 30
measure of the precision 54
missing observations 27, 202, 205
mixed effect 14, 54, 67, 251
mixed model 73
mixing effects 193, 197
mixture experiment 193
multiple comparisons 23, 26, 52, 138, 216
multiple error terms 239, 240
multiple range tests 3
multiple regression 240
multivariate analysis 239
new treatment 113, 169, 171, 179, 189, 191, 194

observational error 80
observational unit, definition 2
INDEX

orthogonal 49, 54, 216, 218
orthogonal, pairwise 122
orthogonality 6, 108, 125, 129, 205
orthogonality, definition 122

parsimonious design 170, 180, 188
partitioning of degrees of freedom 9, 27, 41, 64, 68, 73, 74, 76, 77, 78, 79, 80, 81, 82, 83, 98, 102, 103, 107, 108, 113, 122, 126, 128, 132, 133, 137, 151, 155, 157, 170, 173, 177, 179, 189, 190, 192, 193, 203, 214, 215, 217, 251
per comparison error rate 24
permanent effect 29
placebos 1
points of reference 1
polynomial regression model 239
pooling procedures 133
precision estimates 53, 54
precision of the contrasts 29
PROC MIXED 54

random effect 13, 14, 27, 64, 66, 67, 68, 102, 121, 126, 128, 173, 174, 197, 216, 241, 256
randomization 2, 4, 39, 62, 63, 67, 69, 109, 111, 121, 122, 125, 127, 133, 135, 137, 180, 189, 193, 240, 244
randomization procedure and the layout of a split block design 40
randomized complete block design 3, 7, 8, 10, 39, 40, 41, 46, 47, 62, 77, 79, 80, 97, 98, 102, 104, 108, 113, 120, 125, 127, 135, 137, 190, 215, 218, 240, 244, 252
randomization plan for a standard or basic split plot 4, 5, 6
regression model 240
repeated measurements 29, 43
replication 2, 98, 137, 155, 157, 169, 170, 173, 174, 177, 189, 215, 252
residual effect 241
residuals 138
response model 3, 43, 137
response model equation with a covariate 241
row-column design 61, 75, 97
row-column error mean square 91
sample units, definition 2
sampling error 80
sampling units, definition 2
SAS 112, 113, 129, 171, 172, 180, 189, 196, 218, 219
SAS code 47, 90, 105, 171, 248, 250
SAS PROC MIXED 73, 107, 138, 173, 174, 194, 213, 216
Scheffe’s procedure 24, 25
screening 170, 188, 197
single degree of freedom contrasts 133
software packages 205, 239
spatially designed experiments 91
split block designs with controls 188
split block design 39
split block split block design 100
split plot design 3
split plot experimental unit 3
split plot regression 241, 247, 248
split split plot design 61, 62
split split split plot design 61, 67
square root transformation 86
standard error of a difference 14, 15, 16, 23, 45, 51, 64, 65, 69, 70, 71, 138, 171
standard or control 1, 3, 113
stratification 2
strip block design 39
strip strip block design 100
strip-plot design 39
sub-treatments in strips across blocks 39
systematic arrangement 61, 100, 132

three-factor factorial 11, 121, 125
three-factor interaction 90
time periods 62
transformation 215, 218
treatment design 3, 121
treatment design, definition 1
treatment predictor variable 239, 240
treatment variable 240
treatment, definition 1
trend analysis 240
triple lattice incomplete block design 6, 17
Tukey’s one-degree-of-freedom sum of squares 11, 12
Tukey’s studentized multiple range test 24, 53, 213, 216
two-factor factorial 3
two-way whole plot design 39

valid estimate of an error variance 3
variance component 3, 13, 73, 244, 255, 259
variance heterogeneity 215, 218
variance of a difference 46, 66, 71, 72, 250, 255

variance of a difference between two
adjusted whole plot means 248
variance stabilizing transformation 215
variances of a difference between two
adjusted means 243, 252, 258, 259

whole plot experimental unit 3, 39
whole plot regression 241, 246, 248, 249

Youden design 75, 76, 100